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Scholars in Action

The Practice of Knowledge and the Figure of the Savant in the 18th Century

EDITED BY

ANDRÉ HOLENSTEIN, HUBERT STEINKE & MARTIN STUBER

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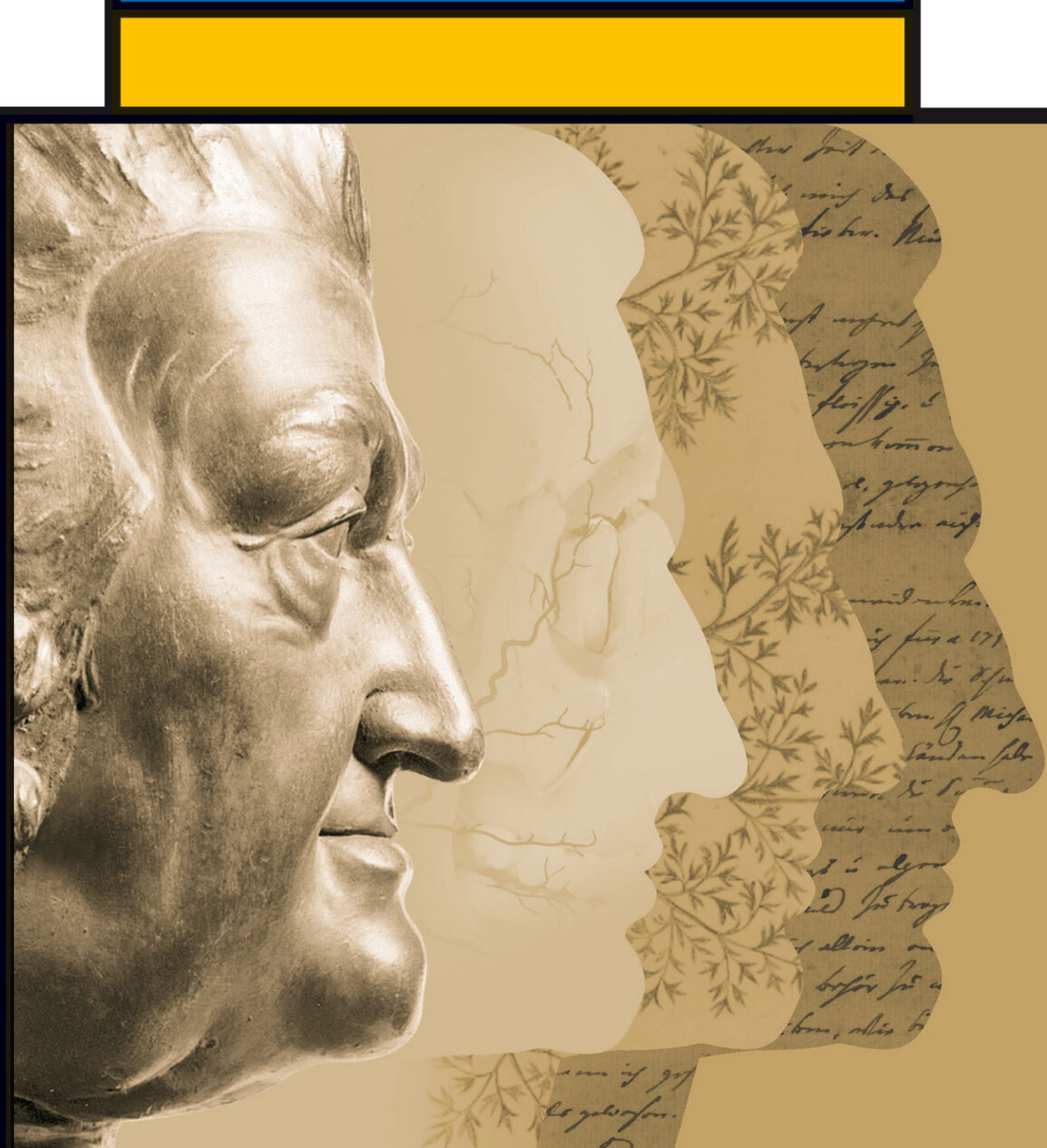

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Volume 1

Edited by

André Holenstein, Hubert Steinke, and Martin Stuber

In collaboration with

Philippe Rogger

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This volume contains a collection of presentations delivered at a conference on the occasion of the 300th anniversary of the birth of Albrecht von Haller (1708–1777). We wish to thank the persons and institutions who contributed to the success of this event: the Albrecht von Haller Foundation (President: J. Harald Wäber; Secretary: Barbara Braun-Bucher), Georg von Erlach (the coordinator of various Haller anniversary events in 2008), the University of Bern and its Institutes of History and History of Medicine, the Hochschulstiftung der Burgergemeinde Bern, the Scientia et Arte Foundation, the Max und Elsa Beer-Brawand-Fonds, the Swiss Academy of Humanities and Social Sciences, the Swiss Academy of Medical Sciences, the Swiss National Science Foundation, the Swiss Society for the History of Medicine and Sciences, the Bern Society for Natural Sciences, Halleriana Bernensis, and the Gesellschaft zu Ober-Gerwern.

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Most of all, however, we wish to thank the authors. Their recent research and insights sparked the idea of producing this book. They have waited for it for a long time. We hope it was worth waiting for.

André Holenstein, Hubert Steinke, Martin Stuber

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INTRODUCTION: PRACTICES OF KNOWLEDGE AND THE FIGURE OF THE SCHOLAR IN THE EIGHTEENTH CENTURY

André Holenstein, Hubert Steinke and Martin Stuber

The present volume contains a collection of presentations delivered at a conference on the occasion of the 300th birthday of Albrecht von Haller (1708–1777). The conference paid tribute to Haller as more than an individual; going beyond biographical treatment, it took this outstanding representative of the scholarly world of the eighteenth century as a starting point and reference point for exploring systematic issues in the early modern history of science and scholarship.[1] The theme of the conference was *scholars* and their *practices of knowledge* in the *eighteenth century*. Based on this theme, the conference linked, in heuristic and conceptual terms, three related sets of issues: The question of practices of knowledge is oriented towards 1) a history of knowledge informed by praxeological and cultural-scientific considerations, with a focus in the present volume on 2) the scholarly community and their activities. This focus concentrated on the eighteenth century—an epoch which, depending on perspective, is seen as the Age of the Enlightenment, the late *Ancien Régime*, or the prelude to the "Saddle Period" [Sattelzeit], as Reinhart Koselleck named the time of transition between the early modern and the modern epochs. Taking a dual approach, this introduction 3) examines, on the one hand, systematic questions pertaining to changes in scholarship and science in the eighteenth century. On the other hand—as an exemplary discussion of the three issues—it 4) looks at the effects of these changes in biographical terms, using the concrete example of the scholarly life of Albrecht von Haller. This dual integration—general as well as specific—of practices of knowledge and scholarly life in the eighteenth

[1] The newest research on Albrecht von Haller includes: Urs Boschung et al. (eds.), *Repertorium zu Albrecht von Hallers Korrespondenz 1724–1777* (Basel 2002), 2 vols.; Hubert Steinke, *Irritating Experiments. Haller's Concept and the European Controversy on Irritability and Sensibility, 1750–90* (Amsterdam 2005); Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005); Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008); Norbert Elsner and Nicolaas A. Rupke (eds.), *Albrecht von Haller im Göttingen der Aufklärung* (Göttingen 2009).

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Fig. 1. Albrecht von Haller, bronzed plaster of the missing bust (1777) by J.F. Funk. Burgerbibliothek Bern, photograph: Gerhard Howald.

century evokes configurations whose contours and changes over time are outlined in what follows. This outline is also meant as a 5) plea for consistent transversal incorporation of research on the early modern history of scholarship into wider debates about the specific epochal nature of the early modern period.

The title *Scholars in Action* refers to the dual focus on scholars and their practices; it follows the approach taken in Bruno Latour's influential work *Science in Action* (1987), building on Latour's conviction that a deeper understanding of the sciences can be gained by studying them *in action*. It is, however, not linked to any specific model in the philosophy of science, such as social constructivism or the actor-network theory.[2] Rather, the contributions included in this volume illustrate the multiplicity of approaches that have been elaborated in the historical sciences in recent years, and which are further developed here. As somewhat more than half of the authors are from German-speaking Europe, the present work reflects trends and themes from this region in particular. Even though the difference between national traditions in recent historiography have barely been touched on or treated, examinations of journals dealing with the history of science reveal that in both England and the United States, publications in other languages are scarcely acknowledged.[3] By publishing this volume in English, we hope to contribute to scholarly exchange across language borders.

The Cultural History of Knowledge

A discussion of scholarly practices of knowledge in the eighteenth century from the perspective of cultural studies, with a view of scholars at

[2] On Latour's sociology of knowledge, see Georg Kneer, Markus Schroer and Erhard Schüttpelz (eds.), *Bruno Latours Kollektive. Kontroversen zur Entgrenzung des Sozialen* (Frankfurt/M. 2007); Anders Blok and Torben Elgaard Jensen, *Bruno Latour. Hybrid Thoughts in a Hybrid World* (New York and London 2011).

[3] Robert Fox, 'Sartonian Values in a Changing World: The Case of Isis', in Marco Beretta et al. (eds.), *Journals and History of Science* (Florence 1998), 119–130; Hubert Steinke and Yves Lang, 'Parochialism or Self-Consciousness? Internationality in Medical History Journals 1997–2006', *Medical History* 55 (2011), 523–538.

that time as virtuoso practitioners of knowledge,[4] is informed by several theoretical and conceptual assumptions.[5]

A core tenet of the sociology of knowledge holds that knowledge is not simply a given but the product of cultural efforts and is, as such, a social phenomenon. Karl Mannheim referred to the existential determination [Seinsverbundenheit] of all thought, thus raising the question of the social determinants and the historicity of knowledge. Speaking in Achim Landwehr's terms, regarding knowledge as culture means two different things: one is "that forms of knowledge always operate within specific cultural contexts and transmit cultural and social values, norms,

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[4] For recent cultural studies approaches to the history of science, see: Dominique Pestre, 'Pour une histoire sociale et culturelle des sciences. Nouvelles définitions, nouveaux objets, nouvelles pratiques', *Annales HSS* 50 (1995), 487–522; 'Einleitung', in Hans Erich Bödeker, Peter Hanns Reill and Jürgen Schlumbohm (eds.), *Wissenschaft als kulturelle Praxis, 1750–1900* (Göttingen 1999), 11–15; Helmut Zedelmaier and Martin Mulsow (eds.), *Die Praktiken der Gelehrsamkeit in der Frühen Neuzeit* (Tübingen 2001); Richard van Dülmen and Sina Rauschenbach, 'Einleitung', in Richard van Dülmen and Sina Rauschenbach (eds.), *Macht des Wissens. Die Entstehung der modernen Wissensgesellschaft* (Köln et al. 2004), 2–8: 2f.; Mary Lindemann (ed.), *Ways of Knowing. Ten Interdisciplinary Essays* (Boston and Leiden 2004); Jakob Vogel, 'Von der Wissenschafts- zur Wissensgesellschaft', *Geschichte und Gesellschaft* 30 (2004), 639–660; Ulrich Johannes Schneider (ed.), *Kultur der Kommunikation. Die europäische Gelehrtenrepublik im Zeitalter von Leibniz bis Lessing* (Wiesbaden 2005); Marian Füssel, *Gelehrtenkultur als symbolische Praxis. Rang, Ritual und Konflikt an der Universität der Frühen Neuzeit* (Darmstadt 2006), 18–32; id., 'Auf dem Weg zur Wissensgesellschaft. Neue Forschungen zur Kulturgeschiche des Wissens in der Frühen Neuzeit', *Zeitschrift für Historische Forschung* 34 (2007), 273–289; Pamela H. Smith and Benjamin Schmidt (eds.), *Making Knowledge in Early Modern Europe. Practices, Objects, and Texts, 1400–1800* (Chicago 2007); Alf Lüdtke and Reiner Prass (eds.), *Gelehrtenleben. Wissenschaftspraxis in der Neuzeit* (Köln et al. 2008); Irène Passeron (ed.), *La République des Sciences*. Special issue *Dix-huitième siècle* 40 (2008); Ulrich Johannes Schneider (ed.), *Kulturen des Wissens im 18. Jahrhundert* (Berlin 2008). There are, however, major differences across this broad range of attempts at conceptual integration of praxeological approaches. Zedelmaier and Mulsow focus closely on scholarly practices and on the conditions that informed and directed scholarly work (normative criteria for selection of themes, technical and methodological working modes, use of "cultural techniques" such as reading, compiling, excerpting, editing, reconstructing and teaching). By doing this, Zedelmaier and Mulsow hope to bring to study of early modern scholarship what has long become standard practice in current historical research on the natural sciences, where the "history and sociology of science" studies science in terms of its daily practice, the routines of the laboratory, the strategies of scientific journals, and the securing of donors.

[5] Johannes Fried and Thomas Kailer, 'Einleitung: Wissenskultur(en) und gesellschaftlicher Wandel. Beiträge zu einem forschungsstrategischen Konzept', in Johannes Fried and Thomas Kailer (eds.), *Wissenskulturen. Beiträge zu einem forschungsstrategischen Konzept* (Berlin 2003), 7–19; Johannes Fried and Michael Stolleis (eds.), *Wissenskulturen. Über die Erzeugung und Weitergabe von Wissen* (Frankfurt/M. 2009).

categories and meanings"; the other, "that forms of knowledge are socially determined".[6]

Acknowledging that all knowledge is embedded in culture challenges historians of knowledge to study knowledge in terms of the conditions of its production and articulation and its specific manifestations in institutions, groups and places. Knowledge is generated and operates in social, cultural and institutional spaces that interact with and influence its substance. Consequently, there is a need to deal more precisely with the "plurality of forms of knowledge"[7] while keeping in mind that knowledge is subject to change through history and that its meaning is dependent on respective social contexts.[8]

In considering the world of scholars, this volume focuses only on one specific field of knowledge among many others—a field of knowledge whose specific cultural and historical characteristics can be explored and described based on a differentiated list of questions. Scholars are of interest here as producers, bearers and transmitters of knowledge. We are concerned with practices that guided the production of knowledge by scholars, the places, spaces and institutions in which they produced knowledge, and the techniques they used to acquire, organise, retain and manage it. We need to gain insights into strategies for staging, presenting, disseminating and publishing scholarly knowledge in the media, as well as in the many circles to which scholarly knowledge was addressed. Also of importance are the different modes of representation and self-staging that served scholars in stylising and legitimising their role and their calling. Furthermore, we are concerned with the functions and the meanings attributed to scholarly knowledge and the figures of argument scholars used to legitimise their activities to themselves, their patrons and the "public". These questions touch on the cultural and political conditions which defined the political, social and economic relevance of scholarly knowledge on the one hand and, as a consequence of this, lent respect, prestige, power and status to scholars in their respective societies and cultural contexts, on the other hand.[9]

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[6] Achim Landwehr, 'Das Sichtbare sichtbar machen. Annäherungen an "Wissen" als Kategorie historischer Forschung', in id. (ed.), *Geschichte(n) der Wirklichkeit. Beiträge zur Sozial- und Kulturgeschichte des Wissens* (Augsburg 2002), 61–89: 72; Pestre 1995 (note 4), 493f.

[7] Landwehr 2002 (note 6), 72.

[8] Vogel 2004 (note 4), 647–651; Füssel 2007 (note 4), 274.

[9] Claus Zittel (ed.), *Wissen und soziale Konstruktion* (Berlin 2002), 7f.; Vogel 2004 (note 4), 647f.; Füssel 2007 (note 4).

The Scholars

The ideal scholar needs to be further differentiated in terms of social and cultural history and thereby be rendered more historically complex.[10] Common references to the Republic of Scholars suggest an image of scholars in the early modern period as basically equal citizens and members of the same virtual community.[11] Yet this image must not be allowed to obscure the considerable differences in the concrete conditions of life of scholars in the early modern period. Devotees of scholarship in the provinces were worlds apart from renowned members of the major European academies, even though they may have corresponded by letter, thereby contributing to local and international circulation of knowledge (see the article by S. Boscani Leoni). Differences in career conditions and scholarly cultures between countries need to be taken into account as well (see the articles by T. Biskup and F. Catherine).[12] The scholarly community included those who taught at universities, members of scientific academies and learned societies, and representatives of independent professions—such as physicians and lawyers—as well as magistrates and civil servants in high-level governmental and administrative commissions who had a university education (see the great diversity of botanists presented in the article by R. Sigrist).[13] In addition to academic teaching positions, research, and scholarly publications, services such as acquisition of materials and information, compilation of observations of nature, opening of well-endowed private libraries to scholars, construction of scientific facilities such as observatories, establishment of botanical gardens, and conducting expeditions to previously unexplored places also qualified individuals for membership in the world of scholarship.[14] Moreover, with

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[10] Steven Shapin, 'The Man of Science', in Katharine Park and Lorraine Daston (eds.), *The Cambridge History of Science*, vol. 3: *Early Modern Science* (Cambridge 2006), 179–191; id., 'The Image of the Man of Science', in Roy Porter (ed.), *The Cambridge History of Science*, vol. 4: *Eighteenth-Century Science* (Cambridge 2003), 159–183; Füssel 2006 (note 4), 2; Jens Häseler, 'Gelehrter', in *Enzyklopädie der Neuzeit* (Stuttgart and Weimar 2006), vol. 4, col. 395–397; Heinrich Bosse, 'Gelehrte und Gebildete—die Kinder des 1. Standes', *Das Achtzehnte Jahrhundert* 32 (2008), 13–37.

[11] Hans Bots and Françoise Waquet, *La République des Lettres* (Paris 1997), 23–27 and 34–55.

[12] Ibid., 24, 95, 102 and 159f.; Füssel 2006 (note 4), 11f.; René Sigrist, 'Correspondances scientifiques du 18e siècle. Présentation d'une méthode de comparaison', *Schweizerische Zeitschrift für Geschichte* 58 (2008), 147–177: 149f.

[13] Füssel 2006 (note 4), 2.

[14] Bots and Waquet 1997 (note 11), 92f.; James McClellan III, 'Scientific Institutions and the Organization of Science', in Porter 2003 (note 10), 87–106.

the development of learned societies even in smaller towns, access to the world of scholarly knowledge was opened up to a broader interested public that had not necessarily enjoyed a higher education but was nonetheless on the point of joining the "educated classes" on the basis of curiosity, interests, and attitudes towards life.[15] Although they had no established status or recognition within the scholarly world owing to their origins in the artisan tradition, experts in mechanics and instrument-making were becoming increasingly important as a result of their technological competence, particularly in sciences which required technically complex instruments and devices that operated with precision.[16]

Practices of Scholarly Knowledge in Transition

In the history of science of the early modern period, the eighteenth century is generally regarded as a phase of transition. As such, it was also a time of substantial change in the image of the scholar, his activities and his social role.

In the history of concepts, it has been noted that the term "scholarship" (or the German "Gelehrsamkeit"), which arose in the sixteenth/seventeenth century, became widely used in the eighteenth century, and in the nineteenth century branched out to encompass the term and concept of science, on the one hand, but also the idea of education outside of academia, on the other. The "golden age" of the Republic of Letters had begun to wane in the middle of the eighteenth century;[17] from the early modern scholar emerged the scientist of the nineteenth century, anchored in his discipline and, as a rule, holding a university professorship, combining academic teaching and research. Additional distinct figures that emerged

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[15] Hans Erich Bödeker, 'Die "gebildeten Stände" im späten 18. und frühen 19. Jahrhundert. Zugehörigkeit und Abgrenzungen. Mentalitäten und Handlungspotentiale', in Jürgen Kocka (ed.), *Bildungsbürgertum im 19. Jahrhundert*, part IV: *Politischer Einfluss und gesellschaftliche Formation* (Stuttgart 1989), 21–52; Denis Sdvižkov, *Das Zeitalter der Intelligenz. Zur vergleichenden Geschichte der Gebildeten in Europa bis zum Ersten Weltkrieg* (Göttingen 2006), 72–76.

[16] Larry Stewart, *The Rise of Public Science. Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660–1750* (Cambridge 1992); Ulrich Troitzsch, 'Erfinder, Forscher und Projektemacher. Der Aufstieg der praktischen Wissenschaften', in van Dülmen and Rauschenbach 2004 (note 4), 439–464; Wolfhard Weber, 'Wissenschaft, technisches Wissen und Industrialisierung', ibid., 607–628; Bernadette Bensaude-Vincent and Christine Blondel (eds.), *Science and Spectacle in the European Enlightenment* (Aldershot 2008).

[17] Bots and Waquet 1997 (note 11), 29 and 34–61; van Dülmen and Rauschenbach 2004 (note 4), 321.

from the early modern scholar in the transition from the eighteenth to the nineteenth century include the man of letters, the intellectual, and the educated citizen.[18]

The scholarly world of the eighteenth century represented a paradigm of knowledge as well as a social group.[19] Consequently, we must consider the morphology and the practices of scholarly knowledge as well as the social profiles of scholars as a group. What were the particular features of the scholarly culture of knowledge in the eighteenth century? What conditions determined the existence and the activities of scholars at that time? And what processes of change, pluralisation and differentiation induced the transition from the early modern culture of scholarly knowledge to modern scientific culture in the course of the eighteenth century?[20] The manifold interactions and feedback loops between scholarly knowledge and the scholarly community on the one hand, and the social, political and economic dynamics of the period on the other, are important factors in this transition that need to be taken into account. Prior to considering decisive processes of change in the world of scholars and scholarly knowledge in the eighteenth century, it must be clearly stated that the eighteenth century cannot be hermetically isolated as a period or separated from the—in some cases strong—lines of continuity that persisted from the seventeenth century. Rather, the eighteenth century appears in many ways to have been a time when the innovations of the seventeenth century were further developed and came to fruition, and when scholarly knowledge first became an integral part of Western culture.[21] With

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[18] Herbert Jaumann, *Handbuch Gelehrtenkultur der Frühen Neuzeit*, vol. 1: *Bio-bibliographisches Repertorium* (Berlin and New York 2004), VIII; Ursula Goldenbaum, 'Das Publikum als Garant der Freiheit der Gelehrtenrepublik gegen Maupertuis und Friedrich II. im Jahre 1752', in Schneider 2005 (note 4), 215–228: 215; Detlef Döring, 'Gelehrsamkeit', in *Enzyklopädie der Neuzeit* (note 10), col. 368–373: 368; Martin Gierl, 'Gelehrte Medien', ibid., col. 377–380: 380; Peter Burke, *Papier und Marktgeschrei. Die Geburt der Wissensgesellschaft* (Berlin 2001), 58ff.; Bosse 2008 (note 10), 31–37.

[19] Gunter E. Grimm, *Literatur und Gelehrtentum. Untersuchungen zum Wandel ihres Verhältnisses vom Späthumanismus bis zur Frühaufklärung* (Tübingen 1983), 3. Grimm, however, speaks of a "scientific paradigm" [Wissenschaftsparadigma] and not of a "knowledge paradigm" [Wissensparadigma].

[20] In focusing on the eighteenth century, the traditional separation of the positively regarded, independent-minded Enlightenment from the negatively perceived pedantic polyhistoric scholarship and polymathy of the Baroque period should be reflected on in terms of a critical review of existing research as well as one's own work. Zedelmaier and Mulsow 2001 (note 4), 2.

[21] Margaret C. Jacob, *The Cultural Meaning of the Scientific Revolution* (New York 1988), 3; Katharine Park and Lorraine Daston, 'Introduction: The Age of the New', in Park and Daston 2006 (note 10), 1–17.

respect to certain other aspects, the new effects of dynamisation and pluralisation of the eighteenth century cannot be overlooked. Although, for reasons of presentation, certain processes of change will be discussed in succession in what follows, they should nevertheless be understood as parts of a dynamic configuration whose elements interacted with each other in complex ways and thus strengthened each other reciprocally as a result of feedback processes and learning processes. Four areas are given particular attention. First, we look at changes in institutions and in the milieu of scholarly practice. This is followed by a consideration of changes in the use of media and communication structures in the scholarly world. Third, we present observations regarding changes in the understanding of science and the new temporality of science that developed as a result. We conclude this section with observations regarding changes in the self-image of scholars and their perception of their roles.

Actors, Institutions and Milieus of Scholarship in Transition

What do we know about expansion of the scholarly community and the differentiation of institutions and milieus of scholarship in the eighteenth century?[22] It has been estimated that the number of members of the Republic of Letters multiplied by at least a factor of ten in the course of the eighteenth century (see the article by L. Brockliss). Universities were newly founded primarily in the Anglo-American world, whereas on the continent the most recent expansion of universities had already taken place in the sixteenth and seventeenth centuries under the influence of the Reformation and confessionalisation.[23] New milieus of scholarly culture developed, however, with the founding of scientific academies and learned societies.[24] These new "agencies of knowledge organisation"

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[22] Daniel Roche, *Le siècle des lumières en province. Académies et académiciens provinciaux 1680–1789* (Paris 1978); id., *Les Républicains des lettres. Gens de culture et Lumières au XVIII^e siècle* (Paris 1988); John Gascoigne, 'The Eighteenth-Century Scientific Community: A Prosopographical Study', *Social Studies of Science* 25 (1995), 575–581; James E. McClellan III, *Science Reorganized. Scientific Societies in the Eighteenth Century* (New York 1985); id. 2003 (note 14), 87–106; William Clark, 'The Pursuit of the Prosopography of Science', in Porter 2003 (note 10), 211–237.

[23] Anton Schindling, *Bildung und Wissenschaft in der frühen Neuzeit* (München 1994), 49; Laurence Brockliss, 'Science, the Universities, and Other Public Spaces. Teaching Science in Europe and the Americas', in Porter 2003 (note 10), 44–86: 52.

[24] Martin Gierl, 'Akademie', in *Enzyklopädie der Neuzeit* (Stuttgart and Weimar 2005), vol. 1, cols. 150–156: 153; McClellan III 2003 (note 14), 90–94.

experienced their real breakthrough in the eighteenth century.[25] The older academies of the seventeenth century renewed themselves (see the article by M. Mücke), and their number increased from 15 to 90 between 1700 and 1790.[26] The dimensions of the scientific society movement can be assessed at best for individual countries. In Switzerland, approximately 150 societies were established in the period between 1600 and 1798, the great majority of them in the final third of the eighteenth century.[27] The significance of these public societies organised as associations by private initiative for the expansion of a scholarly scientific culture should not be underestimated. They included the so-called dilettantes—"lovers of the sciences"—and represented a field of activity that reproduced in miniature the ideal of the Republic of Letters working independently of social status for the common good. In addition, Freemason lodges played a certain role, paradoxically offering, precisely because of their anti-Enlightenment secrecy, a space for free exchange of ideas that corresponded to Enlightenment ideology (see the article by A. Önnerfors).

Individuals aspiring to join the Republic of Letters of the eighteenth century became increasingly less dependent on universities. New venues were open to scholarship including, from the second half of the century, museums, associations and salons, as well as specialised technical-military schools, all of which can be considered as new scholarly facilities.[28] If we also include courts, monasteries, libraries, anatomical theatres, botanical gardens and curiosity cabinets, the world of scholarly learning appears extremely diverse and highly fragmented, reflecting the equally fragmented conditions of a social order based on estates and corporations.[29] Striking differences between the eighteenth and nineteenth centuries include the overall lesser degree to which scholarly activity in

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[25] Bots and Waquet 1997 (note 11), 85f.; Laurence W.B. Brockliss, *Calvet's Web. Enlightenment and the Republic of Letters in Eighteenth-Century France* (Oxford 2002), 10; Gierl 2005 (note 24), col. 153.

[26] Gierl 2005 (note 24), col. 153.

[27] Emil Erne, *Die schweizerischen Sozietäten. Lexikalische Darstellung der Reformgesellschaften des 18. Jahrhunderts in der Schweiz* (Zürich 1988); id., 'Vereine', in *Historisches Lexikon der Schweiz* (HLS), version 30 June 2011, URL: http://www.hls-dhs-dss.ch/textes/d/D25745.php; Otto Dann, *Lesegesellschaften und bürgerliche Emanzipation* (München 1981); Sdvižkov 2006 (note 15).

[28] Döring 2006 (note 18), col. 370; Brockliss 2002 (note 25), 12; id. 2003 (note 23), 73–79.

[29] Helmar Schramm, Ludger Schwarte and Jan Lazardzig (eds.), *Kunstkammer—Laboratorium—Bühne. Schauplätze des Wissens im 17. Jahrhundert* (Berlin and New York 2003); Anthony Grafton, 'Libraries and Lecture Halls', in Park and Daston 2006 (note 10), 238–250; Bruce T. Moran, 'Courts and Academies', ibid., 251–271.

the eighteenth century was organised and the still largely lacking connection between institutionalised research, technical innovation and industrial-commercial application and exploitation. The exercise of scholarly activity in the Ancien Régime was generally less bound to specific permanent facilities. The roles and careers of scholars then, by comparison with scholars in the nineteenth century, were generally less professionalised, less formalised, and less bound to institutions.[30] Nevertheless, the universities developed increasingly as places where careers were made and fields of research were defined (see the articles by I. Fleßenkämper and M. Gierl); and individual personalities such as Haller demanded peer review of research results by scholarly specialists and institutions (see the article by D. Fulda). Furthermore, account must be taken of the weaker integration of scholars in national and nation-state contexts in the pre-revolutionary era. The scholarly elites of the eighteenth century still saw themselves primarily as part of a cosmopolitan, transnational knowledge community, which developed transnational networks despite existing differences—partly neglected by research—in the culture of knowledge, thus enabling pan-European knowledge transfer and cooperation (see the articles by F. Catherine, C. Donato and L. Kontler). They regarded their activities as a useful contribution to enhancing the common good and advancing the intellectual and civilisatory progress of humanity. Their spectrum of values was generally determined by a pre-national patriotism that understood scholarly practice as part of a comprehensive service to the common good. The great majority of scholars, however, lived and worked within local and regional confines.[31]

Despite its weak professionalisation and formalisation and its considerable fragmentation, the scholarly profession in the eighteenth century nonetheless gained in visibility and coherence. Probably decisive in this regard were greater publicity, changes in the availability of scholarly media, and the general expansion of the public sphere, as well as the growing importance of knowledge production based on division of labour,

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[30] Alix Cooper, 'Homes and Households', in Park and Daston 2006 (note 10), 224–237; Paula Findlen, 'Anatomy Theaters, Botanical Gardens, and Natural History Collections', ibid., 272–289; Döring 2006 (note 18), col. 369; Alf Lüdtke and Reiner Prass, 'Einleitung: Gelehrtenleben. Wissenschaftspraxis in der Neuzeit', in Lüdtke and Prass 2008 (note 4), 1–29: 10–12; Sigrist 2008 (note 12), 149.

[31] Bots and Waquet 1997 (note 11), 61; Clark 2003 (note 22), 233–237; see also Jaumann 2004 (note 18), VIII; Ulrich Johannes Schneider, 'Einleitung', in id. 2005 (note 4), 13–18: 14f.; for a specific case, see Regina Dauser et al. (eds.), *Wissen im Netz. Botanik und Pflanzentransfer in europäischen Korrespondenznetzen des 18. Jahrhunderts* (Berlin 2008).

cooperation, and an institutional setting.[32] This greater visibility fostered the development of new market-like structures for gaining scholarly status which, in turn, brought critical examination of established values in their wake (see the article by M. Füssel).

Scholarly journals, as Martin Gierl argues, strengthened the social and conceptual coherence of the Republic of Letters.[33] In this respect, published periodicals appear to have increasingly supplanted learned correspondence (on the importance of earlier journals, see the article by T. Habel). The potential for building coherence deserves particular emphasis with regard to review journals, which introduced individual scholars and their work to the broad community of scholars. In addition, these journals exercised a controlling function that was important for the entire scholarly culture by standardising criteria for scientific activity.[34] Finally, they opened up the communicative space and underscored the importance of scholarly and scientific cooperation in the cumulative process of expanding and improving the body of available knowledge.[35] How the unfolding media culture of the eighteenth century was able to contribute to the consolidation of a feeling of "we"—a collective identity—in the scholarly world can also be seen in the emergence of lexicons of scholars which, even if they highlighted the individual characteristics of particular scholars, nonetheless presented scholars as members of a large family (see the article by U.J. Schneider).[36]

Media, Communication and the Public Sphere in Transition

Scholarship and science are fundamentally linked to communication. Communication is a key to understanding both the Republic of Letters itself and its self-image. Exchange and communication with other scholars reflected the ideal of a scholar's friendly and cooperative behaviour.[37]

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[32] Brockliss 2002 (note 25), 9; Jochen Gläser, *Wissenschaftliche Produktionsgemeinschaften. Die soziale Ordnung des Forschens* (Frankfurt/M. and New York 2006), 243f.

[33] Martin Gierl, 'Gelehrtenrepublik', in *Enzyklopädie der Neuzeit* (note 10), col. 389–392: 391.

[34] Ute Schneider, 'Die Funktion wissenschaftlicher Rezensionszeitschriften im Kommunikationsprozeß der Gelehrten', in Schneider 2005 (note 4), 279–291; Thomas Habel, *Gelehrte Journale und Zeitungen der Aufklärung. Zur Entstehung, Entwicklung und Erschließung deutschsprachiger Rezensionszeitschriften des 18. Jahrhunderts* (Bremen 2007); Gläser 2006 (note 32), 230ff.

[35] Gläser 2006 (note 32), 243.

[36] On collective identity, see ibid., 218.

[37] Hans Bots and Françoise Waquet (eds.), *Commercium Litterarium, 1600–1750. La communication dans la République des lettres* (Amsterdam 1994), VIIf.; Hans Erich Bödeker and

Scholarly culture and media culture were thus very closely linked. As the media changed, the forms and the possibilities of learned communication changed and expanded as well. At the same time, vice-versa, the increase in scholarly activities gave rise to new media. The scholarly culture of the eighteenth century was particularly heavily influenced by the rapidly expanding media and new forms of "publicity".

The development of the scholarly media culture in the eighteenth century must be seen in the context of more general changes. The exponentially expanding production of printed publications was based on an efficient publishing, book-making and printing industry and profited from improved distribution and communication infrastructures.[38] Ultimately, this production was the expression of a growing market driven by increasing demand from the so-called "public" for regular information in the form of periodicals; in other words, it was the expression both of an expanding and increasingly consolidated public sphere and of commercial interests.[39]

The new diversity of media not only enhanced the capacity of communication within the scholarly world but also simultaneously gave a new orientation to the apparatus of science and thus to scholarly practice, subjecting both to new standards.[40] Finally, it made scholarly knowledge easier to obtain and use; and with knowledge becoming more easily accessible thanks to media dissemination, the world of scholarship opened up

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Martin Gierl, 'Einleitung: Jenseits der Diskurse. Aufklärungspraxis und Institutionenwelt in europäisch komparativer Perspektive', in Hans Erich Bödeker and Martin Gierl (eds.), *Jenseits der Diskurse. Aufklärungspraxis und Institutionenwelt in europäisch komparativer Perspektive* (Göttingen 2007), 11–21: 16.

[38] Improved road infrastructures benefited correspondence and the distribution of new printed works as well as travel activities. Exchanges of observations and discoveries were accelerated and discussion of results and theories was facilitated. Wolfgang Behringer, *Im Zeichen des Merkur. Reichspost und Kommunikationsrevolution in der Frühen Neuzeit* (Göttingen 2003).

[39] Ulrich Johannes Schneider and Helmut Zedelmaier, 'Wissensapparate. Die Enzyklopädistik der Frühen Neuzeit', in van Dülmen and Rauschenbach 2004 (note 4), 349–363; Gierl 2006 (note 18), cols. 377–380; Helmut Zedelmaier, 'Lesetechniken. Die Praktiken der Lektüre in der Neuzeit', in id. and Mulsow 2001 (note 4), 11–30: 25; Burke 2001 (note 18), 202; Robert Darnton, *Glänzende Geschäfte. Die Verbreitung von Diderots Encyclopédie. Oder: Wie verkauft man Wissen mit Gewinn*? (Berlin 1993).

[40] Adrian Johns, 'Print and Public Science', in Porter 2003 (note 10), 536–560; id., 'Coffeehouses and Print Shops', in Park and Daston 2006 (note 10), 320–340; Martin Gierl, 'Korrespondenzen, Disputationen, Zeitschriften. Wissensorganisation und die Entwicklung der gelehrten Medienrepublik zwischen 1670 und 1730', in van Dülmen and Rauschenbach 2004 (note 4), 417–438: 425–438.

to a broader public. This resulted not least in the vernacular penetrating into scholarly practice.[41]

Research in recent years has emphasised the modernising effects of the book market in the eighteenth century on the organisation and management of scholarly knowledge.[42] Although personal exchange through correspondence remained a primary instrument of scholarly practice, scholars gained other opportunities to communicate, as well as greater publicity, with the creation of new media.[43] Many of the products of the book market were not actually an innovation of the eighteenth century—learned journals,[44] encyclopaedias and lexica, and publications in the tradition of the *historia literaria* go back to the seventeenth century and in some cases to even earlier periods. But the apparatus of science gained new significance in terms of printed compilation, classification and distribution of scholarly knowledge in the eighteenth century by virtue of greater production, disciplinary differentiation, and integration within a system of self-referential and binding communication among scholars, which fostered self-understanding within the Republic of Letters.[45] This condensation of printed information was accompanied by an accelerated pace of publication and updating of scholarly knowledge, which was a genuine contribution of eighteenth-century culture. The periodicity of journals made circulation of scholarly information more dynamic, thus launching

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[41] Bots and Waquet 1997 (note 11), 54f.; Goldenbaum 2005 (note 18), 15–228; Detlef Döring, 'Gelehrtenkorrespondenz', in *Enzyklopädie der Neuzeit* (note 10), col. 386–389: 388.

[42] Schneider and Zedelmaier 2004 (note 39), 349–363; Martin Gierl, 'Bestandsaufnahme im gelehrten Bereich. Zur Entwicklung der "Historia literaria" im 18. Jahrhundert', in *Denkhorizonte und Handlungsspielräume. Historische Studien für Rudolf Vierhaus zum 70. Geburtstag* (Göttingen 1992), 53–79; id., 'Compilation and the Production of Knowledge in the Early German Enlightenment', in Bödeker, Reill and Schlumbohm 1999 (note 4), 69–103; id., 'Kompilation und die Produktion von Wissen im 18. Jahrhundert', in Zedelmaier and Mulsow 2001 (note 4), 63–94; Frank Grunert and Friedrich Vollhardt (eds.), *Historia literaria. Neuordnungen des Wissens im 17. und 18. Jahrhundert* (Berlin 2007).

[43] Döring 2006 (note 41), col. 388.

[44] On the emergence of scholarly journals in the seventeenth century, see Ursula A.J. Becher, 'Gelehrte Zeitschrift', in *Enzyklopädie der Neuzeit* (note 10), col. 384–386; Döring 2006 (note 41), col. 387. On the expansion of journals throughout Europe from about 1680, see McClellan III 2003 (note 14), 95f.; Gierl 2004 (note 40), 417; id. 2006 (note 18), col. 379.

[45] On "Historia literaria" as an important medium of "scholarly self-understanding in early modern times", see Gierl 1992 (note 42), 53–79; id. 1999 (note 42), 69–103; id. 2001 (note 42), 63–94; id. 2004 (note 40), 417–438; Anne Saada, 'La communication à l'intérieur de la République des Lettres observée à partir de la bibliothèque universitaire de Göttingen', in Schneider 2005 (note 4), 243–254: 244ff.; Grunert and Vollhardt 2007 (note 42), VII–X.

and maintaining a true cycle of distribution of scholarly knowledge.[46] This established the element of novelty and updating as a permanent feature of scholarly communication.[47] Innovative university libraries entered this new system as well. Göttingen, for instance, required their professors to donate the publications they discussed in the *Göttingische Anzeigen von gelehrten Sachen*; this enriched the library and made new knowledge available to local scholars.[48] Instructions for use given in the contemporary *historia literaria* were thus directly operationalised, and its directions regarding compilation of knowledge were implemented in terms of a new orientation of university libraries towards serving both as instruments of research and to foster future-oriented depositories of knowledge.[49]

Changes in Epistemology, New Techniques and Practices of Scholarship and a New Temporality of Knowledge

The acceleration in communication of scholarly news through the medium of scholarly journals and review periodicals, like the differentiation of knowledge compilation in the form of *historia literaria*, encyclopaedias and lexica, was due to a growing need for information, orientation and overview in a rapidly expanding landscape of knowledge. The breakthrough of the journal as a pre-eminent medium in the scholarly world of the eighteenth century reflected an increased demand for up-to-date information from scholarly practice.[50] At the same time, the rise of the journals and the growing importance of small contributions from scholarly practice and of reports on individual empirical observations and experiments indicated a growing interest in detailed analysis of natural facts.[51] Changes in the landscape of the scholarly media reflected a new experience of the temporality of scholarly knowledge—a temporality that had arisen with the fundamental change in the understanding of science and the new practice of observation and experiment since

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[46] Statistics on the great increase in dictionaries in the eighteenth century can be found in H.H.M. van Lieshout, 'Dictionnaires et diffusion du savoir', in Bots and Waquet 1994 (note 37), 131–150; Gierl 2004 (note 40), 430ff. and 435f.

[47] Martin Gierl, 'Kanon und Kritik. Aufklärung und die Vertextung des Sozialen', in Schneider 2005 (note 4), 101–117; Schneider 2005 (note 34), 279–291.

[48] Saada 2005 (note 45), 243–254.

[49] Ibid., 244ff.; Schneider 2005 (note 34), 283f.

[50] Schneider 2005 (note 34), 280f.

[51] Gläser 2006 (note 32), 231f.

the seventeenth century.[52] The modernisation of encyclopaedias in terms of rendering knowledge management more flexible, knowledge authorities more transparent and discursive, and information more up-to-date, responded to new demands for adequate compilation of knowledge that was in step with contemporary developments.[53] Authors made efforts to meet their readers' changed expectations by means of varying forms of self-presentation (see the articles by C. Hirschi on encyclopaedias and H. Rößler on publications in general).

"Temporalisation" was the result of a distancing from tradition and an opening of the knowledge space to what was new. The eighteenth century saw the unfolding and consolidation of the consequences of this fundamental epistemological change, which, in a nutshell, can be characterised as the "dismantling of the dominance of systematic thought in favour of empiricism and practice".[54]

According to the older conception of Aristotelian scholastic natural philosophy, science—as Lorraine Daston has put it—was to strive towards "causal knowledge . . . that was formulated in theorems about universals."[55] Traditional natural philosophy thus concentrated on commentaries on a largely established store of examples. But beginning in the seventeenth century, a new breed of naturalists turned their attention to observation of empirical facts, showing an insatiable appetite for this new activity. In doing so, they enthroned curiosity as a scholarly virtue, whereas

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[52] Ibid., 234; Stewart 1992 (note 16); id., 'The Laboratory, the Workshop, and the Theatre of Experiment', in Bensaude-Vincent and Blondel (note 16), 11–24.

[53] Frank Büttner, Markus Friedrich and Helmut Zedelmaier (eds.), *Sammeln, Ordnen, Veranschaulichen. Zur Wissenskompilatorik in der Frühen Neuzeit* (Münster 2003); Schneider and Zedelmaier 2004 (note 39); Ulrich Johannes Schneider (ed.), *Seine Welt wissen. Enzyklopädien in der Frühen Neuzeit* (Darmstadt 2006); Lieshout 1994 (note 46).

[54] Wolfgang Proß, 'Haller und die Aufklärung', in Steinke, Boschung and Proß 2008 (note 1), 415–458: 415. For more on epistemological change, including the establishment of a new world-view, see Bödeker, Reill and Schlumbohm 1999 (note 4), 14; Lorraine Daston, 'Die moralischen Ökonomien der Wissenschaft', in id., *Wunder, Beweise und Tatsachen* (Frankfurt/M. 2001), 157–184; id., 'Die Lust an der Neugier in der frühneuzeitlichen Wissenschaft', in Klaus Krüger (ed.), *Curiositas. Welterfahrung und ästhetische Neugierde in Mittelalter und früher Neuzeit* (Göttingen 2002), 147–175; Klaus Fischer, 'Die neue Ordnung des Wissens. Experiment—Erfahrung—Beweis—Theorie', in van Dülmen and Rauschenbach 2004 (note 4), 155–185; Gläser 2006 (note 32), 199–230.

[55] Daston 2001 (note 54), 168. See also Peter Dear, 'Jesuit Mathematical Science and the Reconstitution of Experience in the Early Seventeenth Century', *Studies in History and Philosophy of Science* 18 (1987), 133–157; Lynn S. Joy, 'Scientific Explanation from Formal Causes to Laws of Nature', in Park and Daston 2006 (note 10), 70–105; Ann Blair, 'Natural Philosophy', ibid., 365–406.

previously it had been regarded as a grave act of misconduct and a sin.[56] In place of systematic thought and occupation with universals and the general, natural *history* now turned its attention to empirical detail and to the particular.[57] The polymath Johann Jakob Scheuchzer of Zurich (1672–1733) was one of the figures who exemplified this transition at the start of the eighteenth century (see the article by U. Leu). With description of detailed facts of natural history—a practice originally considered as the task of historiography and, consequently, as an activity outside the canon of science[58]—empiricism gradually came to occupy the terrain (see the article by A. Meyer) and helped lend greater visibility to experimentation (see the articles by G. Berg and S. De Angelis), using observation in particular as an active process for garnering knowledge (see the article by L. Daston). Supported by technical expansion of the senses thanks to the microscope and the telescope,[59] but also driven by colonisation and motivated by scientific, political and commercial expeditions to unexplored areas (see the article by Karl S. Guthke),[60] empiricism began to extend

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[56] Daston 2001 (note 54), 174. On curiosity, also in greater detail, see id. 2002 (note 54); Krüger 2002 (note 54). On the priority of observation prior to experimentation, see Gläser 2006 (note 32), 223f.

[57] Daston 2001 (note 54), 175f.; id. 2002 (note 54), 160ff.; Gläser 2006 (note 32), 229f.; Alix Cooper, *Inventing the Indigenous. Local Knowledge and Natural History in Early Modern Europe* (Cambridge 2007).

[58] Wolf Lepenies, *Das Ende der Naturgeschichte. Wandel kultureller Selbstverständlichkeiten in den Wissenschaften des 18. und 19. Jahrhunderts* (München and Wien 1976); Arno Seifert, *Cognitio historica. Die Geschichte als Namengeberin der frühneuzeitlichen Empirie* (Berlin 1976); Reinhart Koselleck, 'Geschichte', in Otto Brunner, Werner Conze and Reinhart Koselleck (eds.), *Geschichtliche Grundbegriffe* (Stuttgart 1975), vol. 2, 678f.; Gianna Pomata and Nancy G. Siraisi (eds.), *Historia. Empiricism and Erudition in Early Modern Europe* (Cambridge 2005); Peter Dear, 'The Meanings of Experience', in Park and Daston 2006 (note 10), 106–131; Richard W. Serjeantson, 'Proof and Persuasion', ibid., 132–175; Paula Findlen, 'Natural History', ibid., 435–468. On the link between the empirical and the historical and their impacts on the design of encyclopaedias, see Schneider and Zedelmaier 2004 (note 39), 357; Schneider 2006 (note 53), 14f.

[59] Wolfgang Behringer, 'Wissenschaft im Kampf gegen den Aberglauben. Die Debatten über Wunder, Besessenheit und Hexerei', in van Dülmen and Rauschenbach 2004 (note 4), 365–389: 376; Gläser 2006 (note 32), 224. On the role of technicians and mechanics (artisans), see Stewart 1992 (note 16); Elisabeth List, *Vom Darstellen zum Herstellen. Eine Kulturgeschichte der Naturwissenschaften* (Weilerswist 2007), 153–157.

[60] Anthony Grafton, *New Worlds, Ancient Texts: The Power of Tradition and the Shock of Discovery* (Cambridge 1992); Justin Stagl, *Eine Geschichte der Neugier. Die Kunst des Reisens 1550–1800* (Wien 2002); Richard Drayton, *Nature's Government. Science, Imperial Britain, and the "Improvement" of the World* (New Haven 2000); Lucile H. Brockway, *Science and Colonial Expansion. The Role of the British Royal Botanic Gardens* (New Haven 2002); Rob Iliffe, 'Science and Voyages of Discovery', in Porter 2003 (note 10), 618–645; Larry Stewart, 'Global Pillage. Science, Commerce, and Empire', ibid., 825–844; Hans-Jürgen Lüsebrink, 'Wissen und außereuropäische Erfahrung im 18. Jahrhundert', in van Dülmen and

the boundaries of the world perceptible to the senses into infinitely large and infinitely small dimensions.[61] The field of phenomena that could be counted as legitimate objects of scientific study was thus newly delimited and submitted to the requirements of scientific investigation (see the article by B. Dietz on travel accounts).

This epistemological break was linked with a new concept of scholarly practice as research. If the science of nature had previously been realised in terms of philological and hermeneutical commentary on scholarly tradition, the new paradigm meant that an unfathomable mass of particular and specific facts burst into the world of the natural sciences.[62] Connected with this new idea of science as research was the notion of the infinity of the research process; the accumulation of scientific knowledge thus became a process that could never be completed. This led to a conception of science as an "uncertain and revisable body of knowledge growing as the result of new facts and revision", whose fragility was apparent not least of all in the numerous controversies at this time (see the article by R. Godel). Understanding scholarship or science as research defined an "open programme designed for endless growth".[63]

Traditional science had presented existing knowledge in a topical context outside of temporal evolution and development and thus—as Ulrich Johannes Schneider and Helmut Zedelmaier have pointed out—it had no concept of the "half-life of decay" of knowledge.[64] By contrast, the new practice of observation of nature and experimentation, with its permanent generation of specific facts, led to a conception of science as a process of cumulative, open-ended increase of knowledge.[65]

Rauschenbach 2004 (note 4), 629–653; Londa Schiebinger and Claudia Swan (eds.), *Colonial Botany: Science, Commerce, and Politics in the Early Modern World* (Philadelphia 2005); Antonio Barrera-Osorio, *Experiencing Nature: The Spanish American Empire and the Early Scientific Revolution* (Austin 2006); William Eamon, 'Markets, Piazzas, and Villages', in Park and Daston 2006 (note 10), 206–223; Steven J. Harris, 'Networks of Travel, Correspondence, and Exchange', ibid., 341–362; Klaus A. Vogel, 'European Expansion and Self-Definition', ibid., 818–839.

[61] Michael Kempe, 'Jungfräuliche Erde, unsichtbare Welten: Mikro- und makrokosmische Ausdehnungen der frühneuzeitlichen Medizin und Naturgeschichte', in Renate Dürr, Gisela Engel and Johannes Süßmann (eds.), *Expansionen der Frühen Neuzeit* (Berlin 2005), 251–275.

[62] Bots and Waquet 1994 (note 37), VIII.

[63] Otto Gerhard Oexle, 'Was kann die Geschichtswissenschaft vom Wissen wissen', in Landwehr 2002 (note 6), 31–60: 32; Gläser 2006 (note 32), 222 (quotation).

[64] Schneider and Zedelmaier 2004 (note 39), 355 (quotation).

[65] Burke 2001 (note 18), 136.

The epistemological break of the seventeenth century and the accompanying step-by-step formulation of the idea of science as research inevitably brought with it a reconception of scholarly practice. Scholarship no longer took the form of "updating the traditional bodies of knowledge", of the "comprehensive and universal erudition" of individual scholars, or of "compilation and careful modification of previously formulated insights". The polymath who had cultivated all bodies of knowledge developed into the disciplinary specialist.[66] The new scholar, from the eighteenth century onwards, gained his recognition increasingly, and in increasingly convincing fashion, as a result of research in a specific discipline and based on evidence of his individual and original contribution to the accumulation of knowledge and to the "inexorable progress of knowledge and understanding".[67] In terms of Koselleck's categories, this transition can be understood as a change from experience- and tradition-driven scholarship to expectation- and future-oriented science.[68]

Scholars' Perceptions of Themselves and Their Roles—A Change in the Instrumentality of Scholarship

Scholars' perceptions of their roles changed in the eighteenth century, and this was due not only to the changes in the understanding of science and in the world of the media. Enlightenment utilitarianism, eudaemonism and purposive rationality became obligations for scholars in the eighteenth century. Zedler's universal lexicon justified the activity of the scholar as a "skill" that was to be used to "learn necessary truths" for the benefit of "human life". Scholars were to contribute to the "achievement of true common weal", a requirement that distinguished scholarship from "pedantic science" that was carried out with no purposeful focus on common usefulness and was self-sufficient.[69] Thus, for example, even scholars who concerned themselves with what appeared to be ivory tower issues such as compiling bibliographies and categorising rare books were unable to escape the obligation of considering the criterion of usefulness (see the article by T. Sander).

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[66] Bots and Waquet 1997 (note 11), 47–50.

[67] Häseler 2006 (note 10), col. 396; Schneider 2005 (note 34), 280f.

[68] In connection with Reinhart Koselleck, see id., '"Erfahrungsraum" und "Erwartungshorizont"—zwei historische Kategorien', in id., *Vergangene Zukunft. Zur Semantik geschichtlicher Zeiten* (Frankfurt/M. 1979), 349–375; Daston 2001 (note 54); Schneider 2005 (note 34); especially Gläser 2006 (note 32).

[69] Johann Heinrich Zedler, *Grosses vollständiges Universal-Lexicon* 10 (1735), col. 725.

Scholars could provide evidence of their usefulness through proposals on how to "elevate" or "raise", in brief: "improve" conditions.[70] Innumerable authors of very diverse backgrounds, such as the philosopher Christian Wolff and the natural historian Albrecht von Haller, met this demand (see the article by H. Boening)—making an effort to call attention to this point on the title pages and in the prefaces of their publications (see the article by R. Siegert). Scholarly knowledge and creative will formed an alliance in the paradigm of usefulness.[71] It is true that already the ideal of humanism had obligated scholarship to serve the common good.[72] But in the age of reformist police states [Policeystaat] this purpose took on a broader character. By making demands for and utilising useful scholarly knowledge, the political and administrative worlds took on rational, methodological features. Scholars frequently had recourse to basic bodies of knowledge, thereby earning particular legitimacy even if the direct usefulness of this knowledge was not always given (see the article by M. Stuber and R. Wyss). Scholars became sought-after civil servants and useful servants of state power. The proximity of scholars to power and the idea of a useful connection between scholarly knowledge and state authority found marked expression in various guises—whether in the presence of scholars at the courts of enlightened absolute monarchs, in the euphoric expectations of scholars regarding the exhilarating and beneficent effects of their reform projects under the protection of learned rulers and philosopher-despots,[73] or in political careers as magistrates in the service of their republic, as in the case of Albrecht von Haller (see the article by B. Braun-Bucher). Science, the economy and power became more closely intertwined in a century of expanding trade, colonisation, permanent warfare and continually

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[70] Bödeker and Gierl 2007 (note 37), 16.

[71] Weber 2004 (note 16), 616; For the technological-economic view of nature in the eighteenth century, see Günter Bayerl, 'Prolegomenon der "Grossen Industrie". Der technisch-ökonomische Blick auf die Natur im 18. Jahrhundert', in Werner Abelshauser (ed.), *Umweltgeschichte. Umweltverträgliches Wirtschaften in historischer Perspektive* (Göttingen 1994), 29–56; Günter Bayerl and Torsten Meyer, 'Glückseligkeit, Industrie und Natur—Wachstumsdenken im 18. Jahrhundert', in Günter Bayerl, Norman Fuchsloch and Torsten Meyer (eds.), *Umweltgeschichte—Methoden, Themen, Potentiale* (Münster et al. 1996), 135–158; André Holenstein, Martin Stuber and Gerrendina Gerber-Visser (eds.), *Nützliche Wissenschaft und Ökonomie im Ancien Régime. Akteure, Themen, Kommunikationsformen* (Heidelberg 2007).

[72] Döring 2006 (note 18), col. 369.

[73] Sina Rauschenbach, 'Wissenschaft zwischen politischer Repräsentation und gesellschaftlichem Nutzen. Über den Traum vom gelehrten Herrscher in der Frühen Neuzeit', in van Dülmen and Rauschenbach 2004 (note 4), 295–318; Bots and Waquet 1997 (note 11), 60.

growing state financial demands. The thirst for knowledge and the curiosity of scholars, and the need of the state to exercise control, increase its power and raise revenue interacted in numerous ways: in the execution of large-scale enquiries and statistical surveys; in the creation of cartographic works and topographical descriptions; in the use of political arithmetic to calculate population numbers and demographic movements; in the soliciting of medical and health specialists to take measures against epidemics and cattle plagues; in state support of scientific expeditions to Siberia or the jungles of South America; in the application of physiocratic theories to design agrarian reforms; in the use of experts to design manufacturing workshops; in the deployment of engineers and hydrological specialists to drain swamps; and in the soliciting of ideas about cameralism and state economy when planning tax reforms.[74] Governments in the eighteenth century mobilised scholarly knowledge for their purposes and put it at their service by linking particular positions in state administration with evidence of expertise.[75] Individual scholars thus obtained important positions in the centres of decision-making on state organisation and could accordingly shape the academic and bureaucratic field of entire administrative sectors (see the article by H. Schleiff).

While proximity to power made the scholar an expert in the service of the state (see the article by J. Stagl), by distancing himself from authority and by virtue of his criticism of the agencies of power, in the second half of the eighteenth century the scholar developed into the intellectual.[76] The birth of the intellectual—paradigmatically exemplified by the Calas

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[74] Peter Fox, 'Science and Government', in Porter 2003 (note 10), 107–128; Shapin 2003 (note 10), 178–183.

[75] Charles C. Gillispie, *Science and Polity in France at the End of the Old Regime* (Princeton 1981); Éric Brian, *La Mesure de l'Etat. Administrateurs et géomètres au XVIII^e siècle* (Paris 1994); John Gascoigne, *Joseph Banks and the English Enlightenment. Useful Knowledge and Polite Culture* (Cambridge 1994); id., *Science in the Service of Empire. Joseph Banks, the British State and the Uses of Science in the Age of Revolution* (Cambridge 1998); Drayton 2000 (note 60); Hans Erich Bödeker, 'On the Origins of the "Statistical Gaze": Modes of Perception, Forms of Knowledge and Ways of Writing in the Early Social Sciences', in Peter Becker and William Clark (eds.), *Little Tools of Knowledge. Historical Essays on Academic and Bureaucratic Practices* (Ann Arbor 2001), 169–195; Charles C. Gillispie, *Science and Polity in France: The Revolutionary and Napoleonic Years* (Princeton 2004); Eric J. Engstrom (ed.), *Figurationen des Experten. Ambivalenzen der wissenschaftlichen Expertise im ausgehenden 18. und frühen 19. Jahrhundert* (Frankfurt/M. 2005); Schneider 2005 (note 34), 281.

[76] Sdvižkov 2006 (note 15), 37; Ingrid Gilcher-Holtey, *Eingreifendes Denken. Die Wirkungschancen von Intellektuellen* (Weilerswist 2007); Kirill Abrosimov, 'Die Genese des Intellektuellen im Prozess der Kommunikation. Friedrich Melchior Grimms "Correspondance littéraire", Voltaire und die Affäre Calas', *Geschichte und Gesellschaft* 33 (2007), 163–197.

affair and Voltaire's engagement on behalf of the victims of religious persecution and miscarriage of justice—was an indication of the separation of state and society, of the governmental and the public, of the political and the pre-political (see the articles by K. Abrosimov and S. Zurbuchen).[77] This separation created a place for the intellectual as a figure who, based on his authority and respect in the world of scholars and scientists, was destined to an extraordinary extent, and with great power of conviction to take political positions, to become engaged in social issues, and, in the final instance, to be a martyr in the cause of the persecuted and the oppressed.[78] Nevertheless, despite this reference to the birth of the intellectual in the late Ancien Régime, it must not be forgotten that the great majority of scholars in the eighteenth century remained embedded in the lifeworlds of a social order based on estates and corporations. They fully conducted themselves as proud members of their profession and defended a particular and genuinely community-oriented understanding of honour as, for example, when they became involved in disputes over rank and respectability with citizens in university towns and with members of the nobility.[79] Recent research has advocated the view that eighteenth-century scholars belong in the old European lifeworld, and thus presented them from perspectives that had received too little consideration in the traditional history of science. Stubborn priority disputes on scientific discoveries and bitter conflicts waged against other corporations over primacy and precedence, were both expressions of an agonal culture of controversy in the Republic of Letters. And as Marian Füssel has shown, the members of the Republic of Letters were all the more aware of the importance of symbolic communication for asserting their reputation, precisely because their status as a professional group tended to be precarious.[80] This context also includes an observation on early clientelism

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[77] Sdvižkov 2006 (note 15), 37.

[78] Gilcher-Holtey 2007 (note 76), 12f.; Abrosimov 2007 (note 76).

[79] Shapin 2003 (note 10); Füssel 2006 (note 4), 118–126. Haller, too, signed his articles for the *Supplément of the Encyclopédie* and for the *Encyclopédie d'Yverdon* with the initials "H.D.G." (an abbreviation for Haller de Goumoëns). In 1764 Haller acquired the small homestead of Goumoëns le Jux in the Canton of Vaud. See Alain Cernuschi, 'Le corpus des articles encyclopédiques de Haller: établissement définitif et histoire de la rédaction', in Jean-Daniel Candaux et al. (eds.), *Albrecht von Haller zum 300. Geburtstag* (s.l. 2008), 97–107: 99.

[80] Anne Goldgar, *Impolite Learning. Conduct and Community in the Republic of Letters, 1680–1750* (New Haven 1995); Bots and Waquet 1997 (note 11), 124f.; Markus Friedrich, *Grenzen der Vernunft. Theologie, Philosophie und gelehrte Konflikte am Beispiel des Helmstedter Hofmannstreites und seine Wirkungen auf das Luthertum um 1600* (Göttingen 2004); Martin

made under the impression of the general upsurge of research in the early modern period—that patronage played a substantial role in the scholarly world as an informal institution for the production and reproduction of power relations. Scholars were frequently socially and culturally bound by relations with powerful princely and noble patrons who protected them and gave them financial support. Patrons thus directed the practices of scholarship and even first made them possible, while also leaving their mark on them in terms of their own social, cultural, political and economic interests which did not necessarily have to correlate with the needs and aims of the scholars themselves.[81]

Albrecht von Haller—A Quintessential Scholar

Albrecht von Haller—poet and scholar, collector and experimenter, encyclopaedist and specialised researcher, university professor and magistrate, society president and correspondent, prominent author and influential reviewer, modern scientist and orthodox Christian—is a paradigmatic figure who reflects many of the problematic issues and developments in the eighteenth-century culture of knowledge. If in what follows we place the polymath from Bern in the centre of focus, this is based on two premises. On the one hand, we are less concerned with his extraordinary stature than with his exemplary character. On the other hand, we wish to illustrate the good availability of source material from which we can benefit in Haller's case. Contrasting various sources allows us to trace and analyse many of the tensions as well as the connections between scholarly practice and the figure of the scholar. The process of self-constitution is of particular interest in this respect. Recent biographical studies assume that renowned natural scientists not infrequently participated in constructing a public image of themselves and their activities by actively stylising their biographies, as Charles Darwin did in the nineteenth century and Niels K. Jerne in the twentieth century.[82]

Mulsow, 'Eine Reise durch die Gelehrtenrepublik. Soziales Wissen in Gottlieb Stolles Journal der Jahre 1703–1704', in Schneider 2005 (note 4), 185–201; id., *Die unanständige Gelehrtenrepublik. Wissen, Libertinage und Kommunikation in der Frühen Neuzeit* (Stuttgart 2007); Füssel 2006 (note 4), 126.

[81] Bruce T. Moran (ed.), *Patronage and Institutions: Science, Technology and Medicine at the European Court, 1500–1750* (Woodbridge 1991); Mario Biagioli, *Galileo, Courtier. The Practice of Science in the Culture of Absolutism* (Chicago 1993); Moran 2006 (note 29), 251–271.

[82] Hans Erich Bödeker (ed.), *Biographie schreiben* (Göttingen 2003).

To a certain degree the first biography of Haller, which was published in 1755 (*Das Leben des Herrn von Haller*), is based on such self-construction of the biographical ego. That this biography was meant for representational purposes can already be surmised from the title page, which shows an image of Haller on a medal created by Johann Melchior Mörikofer that portrayed him in profile and in theatrical grandeur, with his head barely distinguishable from the head of King George II as depicted on the prize medal given by the Göttingen Society of Sciences, which had also been created by Mörikofer.[83] This first biography of Haller was written by Johann Georg Zimmermann, who had studied medicine under Haller


Das Leben
des
Herrn von Haller
von
D. Johann Georg Zimmermann,
Stadt-Physicus in Brugg.
— — vvhose Mind
contains a vvorld, and seems for all things fram'd.
ALBERTUS · HALLERIUS
PATRIÆ NOVA SERTA PARAVIT
FAMAM EXPRESSIT
IN ÆRE
MÖRIKOFER
Zürich,
bey Heidegger und Compagnie,
1755.
Bibliothek des Universität Bern Medizinhistorisches Institut

Fig. 2. Johann Georg von Zimmermann, *Das Leben des Herrn von Haller* (Zürich 1755, title page).

[83] Marie Therese Bätschmann, 'Haller im Porträt', in Steinke, Boschung and Proß 2008 (note 1), 497–514: 507.

Fig. 3. Prize medal of the Royal Academy of Sciences of Göttingen (awarded since 1751) with its patron King George II. Niedersächsisches Münzkabinett der Deutschen Bank (Hannover).

in Göttingen and lived in his home. Zimmerman's personal acquaintance with Haller attested to the accuracy of the biographical material he presented, as he noted in his foreword: "But what puts me in a position to present to the world reliable information about the life of Mr. von Haller is the fact that I was fortunate enough to be able to live with him for an extended period of time."[84] By contrast, research on Haller has shown that Zimmermann's biography contains a great deal of stylisation. Haller actually distanced himself from Zimmermann's work in his anonymous review for the *Göttingische Gelehrte Anzeigen*. Yet from his correspondence with Zimmermann we know that he directly influenced many of the details in this biography and also read and corrected the entire manuscript prior to its publication.[85]

Zimmermann makes the life of the young Haller appear to be a true prologue to the life of the later scholar. He described Haller's stay with relatives in the town of Biel when he was 14–15 years old as follows: "He was sickly in Biel and was scorned by everyone he wanted to see. He thus shut himself up in his room for months at a time composing verses, which was his only comfort."[86] In Zimmermann's presentation, Haller the future scholar and poet was in the company of Malebranche, Pascal and Pope—of weak physical stature and excluded from society, but all the stronger in terms of mental faculties. In retrospect, sickliness appeared as the path to scholarliness. Haller's pocket calendar, in which he noted all of his expenses during this time in exact detail, gives a very different

[84] Johann Georg Zimmermann, *Das Leben des Herrn von Haller* (Zürich 1755), preface [unpaginated].

[85] See Erich Hintzsche, 'Einige kritische Bemerkungen zur Bio- und Ergographie Albrecht von Hallers', *Gesnerus* 16 (1959), 1–15.

[86] Zimmermann 1755 (note 84), 16.

picture. His handwritten entries refer to outings, canoe trips, visits to fairs, expenses for wine and tobacco, and gambling losses.[87]

Haller's unsuccessful applications for positions as the fourth city physician and as a professor of rhetoric at the College [Hohe Schule] of Bern in 1734 provide an analogous example. Zimmermann attributed Haller's lack of success to unjustified criticism of his universality: "Why does Dr. Haller want to become a hospital physician when he is a poet, they asked in Bern. And of the professorship of rhetoric it was said that it was not for a physician."[88] This view is put into perspective if we look beyond this particular case to consider the contemporary context more closely. Haller's application for the position of city physician was accepted, even though he was too young according to regulations; indeed, he lost out in the selection process to an older colleague. Most young physicians had similar experiences, both before and after Haller; only rarely, when there was a shortage of physicians, did a young man obtain the position on his first attempt.[89] In the case of the professorship of rhetoric, the young Haller faced competition from 11 other candidates. Johann Georg Altmann, the candidate who was ultimately successful, was 13 years older than Haller and had previously made five unsuccessful applications for a professorship.[90]

The use of contrasting and contextual sources reveals the tensions between the constructed public figure and the actual concrete circumstances of his life. This phenomenon has been widely known in theoretical terms at the latest since Lorraine Daston published her influential essay on the ideal and reality in the Republic of Letters.[91] However, the rich and well-documented body of sources in the case of Haller allows us to extend this approach in multifaceted ways. By doing this on the basis of the categories we proposed for the conference on "The Practice

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[87] Karl S. Guthke, 'Der Stubenhocker als Kegelspieler: Hallers Jugend in neuem Licht', in id., *Das Abenteuer der Literatur. Studien zum literarischen Leben der deutschsprachigen Länder von der Aufklärung bis zum Exil* (Bern and München 1981), 49–54; Urs Boschung, 'Prägendes Jahr für den späteren Forscher. Albrecht von Haller in Biel, 1722–1723', *Bieler Jahrbuch* (2009), 26–58; id., 'Albrecht von Hallers Krankheiten in seiner Korrespondenz', in Stuber, Hächler and Lienhard 2005 (note 1), 221–275: 222–225.

[88] Zimmermann 1755 (note 84), 108–109.

[89] Hintzsche 1959 (note 85), 8.

[90] Friedrich Haag, *Die Hohe Schule zu Bern* (Bern 1903), 101f.; Rudolf Ischer, *Johann Georg Altmann (1695–1758). Die Deutsche Gesellschaft und die moralischen Wochenschriften in Bern* (Bern 1902), 54.

[91] Lorraine Daston, 'The Ideal and Reality of the Republic of Letters in the Enlightenment', *Science in Context* 4 (1991), 367–386.

of Knowledge and the Figure of the Savant in the Eighteenth Century" in what follows, we simultaneously offer a biographically concretised tour of the basic themes of the present volume.

Rising and Advancing: The Career of the Scholar

Only individuals who conducted regular correspondence by letter were eligible for active membership in the Republic of Letters. Not every scholar, however, had a network of correspondence like Haller's, whose dimensions revealed the pre-eminent position in the scholarly world that the Bernese polymath had attained in the course of his lifetime.[92] An attempt to reconstruct how Haller became the focal point of such a pan-European network brings to light some of the basic mechanisms of career advancement in the Republic of Letters.

Johann Georg Zimmermann wrote in his biography of Haller that "never has Mr. Haller initiated correspondence, as the pleasure that he obtained from so doing is at the same time a burden; but never in his life did he leave a letter unanswered—in fact he has always replied with incredible speed."[93] Zimmermann took this passage virtually verbatim from a letter Haller had written to him: "J'en ai jamais commencé [une correspondance], parce qu'en me faisant plaisir elles me chargeoient. Mais aussi je n'ai laissé personne sans reponse et j'ai meme répondu avec expedition."[94] The second part of this compact self-characterisation touched on a basic feature of scholarly communication that was organised according to the principles of reciprocity and useful friendships.[95] Only those who answered letters reliably and quickly were able to maintain a good reputation in the obligation-based community of scholars; this specific obligation, however, was certainly not always a source of pleasure. By contrast, the first part of Haller's statement, "j'en ai jamais commencé", belongs in the category of self-stylisation. It is true that over the entire

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[92] Boschung et al. 2002 (note 1); Stuber, Hächler and Lienhard 2005 (note 1); Martin Stuber, Stefan Hächler, Lothar Krempel and Marion Maria Ruisinger, 'Exploration von Netzwerken durch Visualisierung. Die Korrespondenznetze von Banks, Haller, Heister, Linné, Rousseau, Trew und der Oekonomischen Gesellschaft Bern', in Dauser et al. 2008 (note 31), 347–374.

[93] Zimmermann 1755 (note 84), 410–411.

[94] Letter from Haller to Zimmermann, 28 June 1754, in Eduard Bodemann (ed.), *Von und über Albrecht von Haller: ungedruckte Briefe und Gedichte Hallers sowie ungedruckte Briefe und Notizen über denselben* (Hannover 1885), 18.

[95] Hubert Steinke, *Der nützliche Brief. Die Korrespondenz zwischen Albrecht von Haller und Christoph Jakob Trew 1733–1763* (Basel 1999).

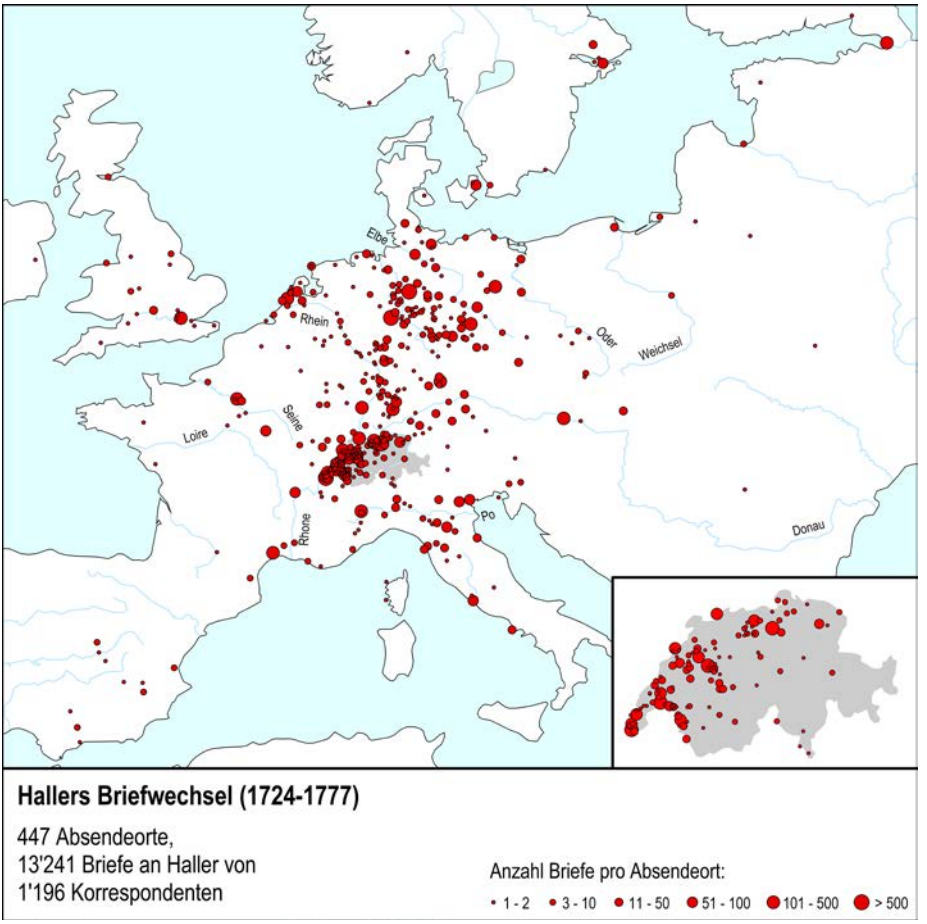

Fig. 4. Haller's European correspondence network. Cartography by Richard Stuber (Bern).

course of his lifetime, the majority of Haller's correspondences were initiated not by him but by his correspondents. As a young man, however, Haller frequently had to take the initiative, particularly when it came to older luminaries in the scientific world. He initiated correspondence with Giovanni Battista Morgagni, Professor of Anatomy in Padua and his elder by 26 years, offering to supply him with foreign literature and provide him with news about his German colleagues.[96] During his study travels, Haller

[96] Boschung et al. 2002 (note 1), no. 719.

deliberately sought meetings with famous scholars including, for example, Lorenz Heister, Professor of Practical Medicine in Helmstedt, who was 25 years older than he; Johann Jakob Scheuchzer, the polymath from Zurich who was 36 years older; and Hans Sloane, President of the Royal Society in London, who was 48 years older. To all three he subsequently wrote a first letter to propose a correspondence.[97] He also initiated a consequential correspondence with Christoph Jakob Trew, physician, botanist and editor in Nuremberg and his elder by 13 years, by writing:

> The surgeon Hommel gave me a very welcome piece of news in assuring me that you, renowned Sir, would not be averse to exchanging letters with me. I shall seize the opportunity and hereby thank you for your openness towards me. I thus invite you to engage with me in a highly desired competition in the spirit of mutual friendship. I shall never allow my good deeds to be surpassed . . . I should also like to collect for you a bundle of Alpine plants which, so I hear, you are fond of . . .[98]

Several typical elements of such correspondence are apparent here: the intermediary figure from the barbers' guild, Johann Ludwig Hommel, who had studied anatomy with Trew in Nuremberg and moved to Bern in 1732 to become Haller's assistant; Hallers' subservient tone; the offer of useful services and, finally, an initial gift in the form of Alpine plants. All of this had the full effect that Haller desired. Ongoing correspondence did indeed result, and Haller was able to publish his first scientific articles in the renowned specialised journal edited by Trew, the *Commercium Litterarium*. It was these publications which ultimately led to Haller being called to Göttingen in 1736, where he himself subsequently became a scholarly luminary. Only at this point did Haller no longer have to initiate correspondence himself; instead, he was sought as a correspondent by others, to a degree that was often excessive.

Printing and Communicating: The Presentation and Diffusion of Knowledge

Haller was one of the most productive scholars of his time. He published 24 monographs in 50 volumes, 136 treatises, 200 articles in encyclopaedias and 25 prefaces, and was the editor of ten works in 52 volumes. In addition, the recorded evidence of his European-wide correspondence network

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[97] Martin Stuber, 'Brief und Mobilität bei Albrecht von Haller. Zur Geographie einer europäischen Gelehrtenkorrespondenz', in Johannes Burkhardt and Christine Werkstetter (eds.), *Kommunikation und Medien in der Frühen Neuzeit* (München 2005), 313–334.

[98] Haller to Trew, 24 November 1733. Steinke 1999 (note 95), 59.

consists of 17,000 letters from approximately 1,200 correspondents and from a total of 447 different locations. Haller's printed publications were frequently closely interlinked with his handwritten communications. On the one hand, broad consultation and use of specialised literature was an integral part of the research process in Haller's concept of science; a pool of around 50 regular correspondents in European centres of scientific activities guaranteed him a continuous supply of specialised literature.[99] On the other hand, the sharp distinction between private and public as seen from the perspective of modern civil society should not be too hastily attributed to the early modern period. Haller's private letters were frequently read not only by those to whom they were directly addressed but, from case to case, by other people, relatives, friends or acquaintances as well. Moreover, subsequent publication of letters was not infrequent. But, nonetheless, it is precisely these moments of transformation from private to public which clearly show that contemporaries were quite well aware of the different levels of communication.[100] Towards the end of his life Haller issued a six-volume selection of letters written to him in Latin. In his own words, he hoped to impart "useful observations" from the fields of medicine and natural history, selecting only letters that had a direct bearing on scientific topics.

Haller also made stylistic improvements, removed any praise of the editor, and omitted most of the controversial passages that dealt critically with third parties.[101] The secretary of the Swedish Academy, Pehr Wilhelm Wargentin, reacted to Haller's publication of letters in very negative terms, deploring that Haller had published his letters without permission, as his use of Latin and French in the letters was poor and he had frequently written in too confidential a manner; he thus expected that the public would certainly find much to object to. In order to reprimand Haller for this breach of trust and prevent the publication of further editions without permission, Wargentin vowed that he would write his future letters to Haller in Swedish—which he actually did.

Similar drawing of boundaries between handwritten and printed communication can be found in many places throughout Haller's extensive

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[99] Hubert Steinke and Martin Stuber, 'Haller und die Gelehrtenrepublik', in Steinke, Boschung and Proß 2008 (note 1), 381–414: 398.

[100] Martin Stuber, Stefan Hächler and Hubert Steinke, 'Albrecht von Hallers Korrespondenznetz. Eine Gesamtanalyse', in Stuber, Hächler and Lienhard 2005 (note 1), 1–216: 54–58.

[101] David Krebs, 'Latein als Medium wissenschaftlicher Kommunikation bei Albrecht von Haller', in Stuber, Hächler and Lienhard 2005 (note 1), 351–370: 365–368.

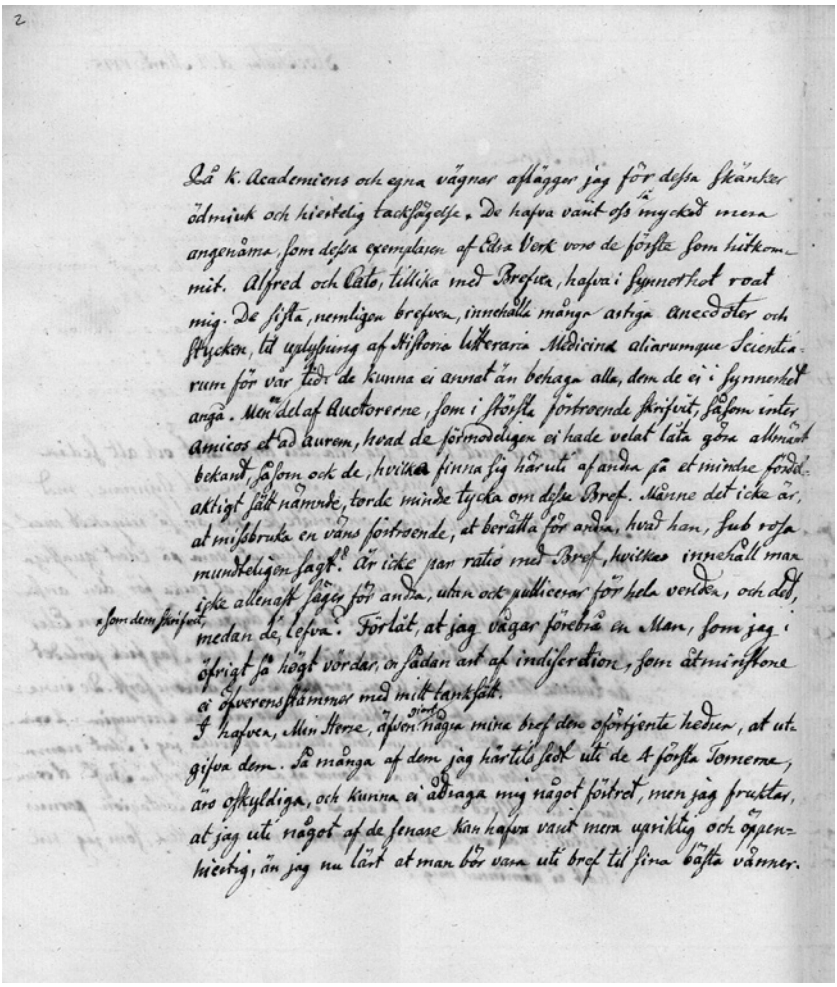

Fig. 5. Letter from Pehr Wilhelm Wargentin to Albrecht von Haller, 7 March 1775, in Swedish. Burgerbibliothek Bern.

correspondence. Thus Haller complained that his botanical antipode, Carl von Linné, despite affirming his friendship in private letters to Haller, criticised him publicly in his publications. Conversely, when Haller himself expressed his criticism of a book of tables published by the renowned anatomist Bernhard Siegfried Albinus, he did not do so publicly in a review in the *Göttische Gelehrte Anzeigen*, but explicitly and confidentially only to one friend, by letter.

Observing and Experimenting: The Production of Knowledge

Haller called repeatedly for observation and experimentation as the central foundation of all sciences. This rhetoric ensured him the general approval of the scholarly world. Nevertheless, the decisive feature of this demand was the consistence with which he implemented it in practice in his various fields of work.[102] Moreover, in the cases of both physiological experiments and botanical observation, this was not only a matter of individual activity by an individual researcher but to an equal degree also concerned the collective practice of an entire group of researchers. In the European controversy over irritability and sensibility, in which Haller played a key role, no less than 144 research scientists were actively involved on his side.[103] And in his major work on the flora of Switzerland, he named 40 contemporaries who had given him essential support in collecting plant specimens.[104]

Within Haller's correspondence network, experimentation and observation by such groups of researchers appear to have been embedded in an economy of exchange.[105] For example, he rewarded two of his most important fellow combatants in the irritability debate, Samuel Auguste Tissot and Leopoldo Marcantonio Caldani, by arranging for them to obtain a prestigious membership in the Royal Society.[106] Haller also bestowed numerous rewards on the naturalist Horace-Bénédict de Saussure of Geneva, who was one of his most important botanical informants. Saussure was mentioned as a collector in numerous places throughout Haller's *Flora*; he was supported by Haller in his successful application for a professorship of philosophy and natural history at the Geneva Academy; and Haller provided medical support for Saussure's sick mother for an extended period of time.[107] Based on the individual correspondences it is even possible to reconstruct an actual typology of relations (vertical

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[102] Otto Sonntag and Hubert Steinke, 'Der Forscher und Gelehrte', in Steinke, Boschung and Proß 2008 (note 1), 317–346: 325–329.

[103] Steinke 2005 (note 1), 125–174.

[104] Luc Lienhard, '"La machine botanique". Zur Entstehung von Hallers Flora der Schweiz', in Stuber, Hächler and Lienhard 2005 (note 1), 371–410: 373.

[105] See Staffan Müller-Wille, 'Botanischer Tausch und Ökonomie der Natur', in Dauser et al. 2008 (note 31), 79–89.

[106] Hubert Steinke, 'Der Patron im Netz. Die Rolle des Briefwechsels in wissenschaftlichen Kontroversen', in Stuber, Hächler and Lienhard 2005 (note 1), 441–462: 551–554.

[107] Stefan Hächler, 'Arzt aus Distanz. Fernkonsultationen bei Albrecht von Haller', in Stuber, Hächler and Lienhard 2005 (note 1), 317–349: 323–325.

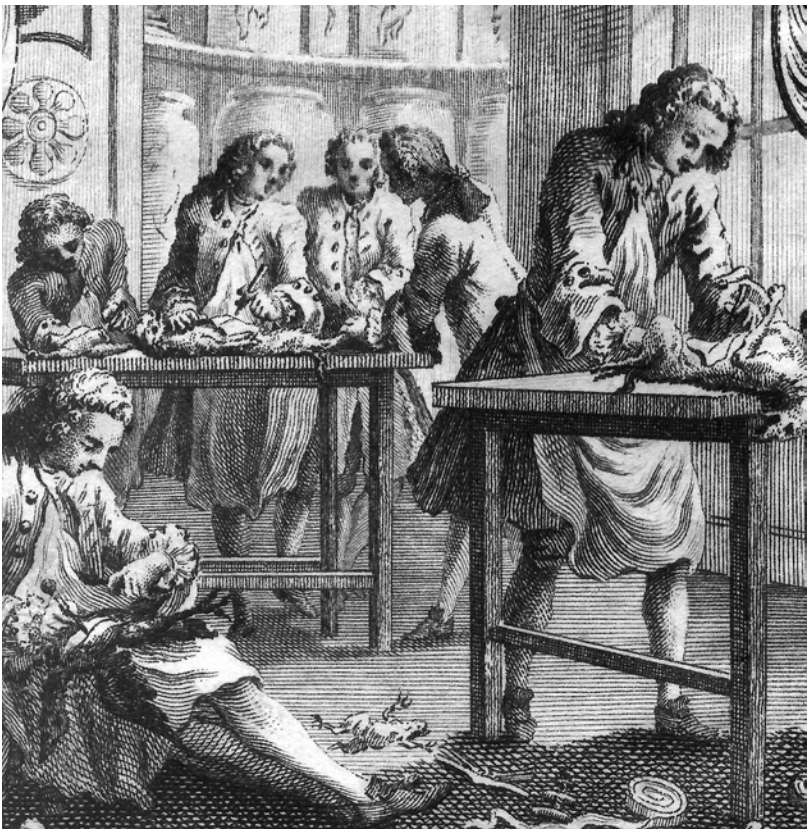

Fig. 6. Frontispiece to Albrecht von Haller's collection of experiments on irritability and sensibility: *Mémoires sur les parties sensibles et irritables du corps animal*, 1756–1760 [detail]. Copperplate engraving, artist unknown. Institute for the History of Medicine (Bern).

and horizontal) and return services.[108] The production of knowledge thus appears as an activity which is to a high degree socially determined.

Reading and Judging: The Appropriation and Criticism of Knowledge

Already as a librarian in Bern in 1735, Haller sought to establish a library that was research-oriented and accordingly focused his acquisition activities on reading, judging what he read, and making it available for use

[108] Stefan Hächler, '"Avec une grosse boete de plantes vertes"—Pflanzentransfer in der Korrespondenz Albrecht von Hallers', in Dauser et al. 2008 (note 31), 201–218.

Fig. 7. Page from Albrecht von Haller's herbarium with a specimen of the mountain kideny-vetch (*Berg-Wundklee*) collected by Horace-Bénédict de Saussure on the Mont Salève near Geneva. Herbarium P. Muséum National d'Histoire Naturelle (Paris).

(see the article by C. Engler). He continued this approach in later stages of his career, pursuing various strategies for managing the increasing flood of publications (see the article by M. Nicoli). One of these strategies was to continuously write critical summaries of everything he read. It is a known fact that Haller wrote an almost unimaginable 9,000 reviews for the *Göttingische Gelehrte Anzeigen* (see the articles by A. Saada and F. Catherine).[109] Less well known, but rather self-evident, is the fact that this review activity left extensive traces in Haller's correspondence.[110] For one thing, Haller was concerned with timely acquisition of publications from throughout Europe. It was not sufficient to know a good bookseller or have a few connections; rather, it took a great number of correspondents in many different places in order to gain access to locally produced books and journals within a reasonable period of time. Furthermore, many of his correspondents tried to prompt Haller to review their own works and attempted to influence his reviews favourably. One example among many illustrates this. The young Friedrich Wilhelm Weiss wrote to Haller in a letter accompanying his botanical dissertation:

> I owe many and, indeed, the most important observations to the instructions given in Your outstanding works on Swiss plants . . . the example of Your Lordship taught me to observe nature itself and to take it as the best teacher. Should I deviate in some cases from Your observations, I hope Your Lordship will not think badly of me for it . . . The influence which the opinions and the recommendations of Your Lordship enjoy with His Excellency our Prime Minister gives me the pleasant hope that a word from Your Lordship to His Excellency our Prime Minister will have an extraordinary effect on my fortune in the future.[111]

At this point it is important to note that in his dissertation Weiss did not follow Haller's nomenclature but that of Haller's competitor, Carl von Linné. At the same time, Weiss nonetheless hoped to benefit from a good word from Haller to the influential curator of the Göttingen university, Minister Gerlach Adolph von Münchhausen, with whom Haller was in close contact.

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[109] Steinke and Stuber 2008 (note 99), 398; see Claudia Profos Frick, *Gelehrte Kritik. Albrecht von Hallers literarisch-wissenschaftliche Rezensionen in den Göttingischen Gelehrten Anzeigen* (Basel 2009).

[110] Entire paragraph after Martin Stuber, 'Journal and Letter: The Interaction between Two Communications Media in the Correspondence of Albrecht von Haller', in Hans-Jürgen Lüsebrink and Jeremy D. Popkin (eds.), *Enlightenment, Revolution and the Periodical Press* (Oxford 2004), 114–141.

[111] Wilhelm Friedrich Weiss an Albrecht von Haller, 21 May 1770. Burgerbibliothek Bern.

The review system can only be understood if its study is not limited to the printed "surface" but also takes account of the "underground" which is not visible to the public but can be accessed through systematic consideration of the letter as a complementary source.

Perceiving and Reacting: The Scholar and Contemporary Trends

Haller was also conscious of the different levels of communication when reacting to the current trends of his time. This can be seen, for example, in his dispute with Voltaire—his ideological opponent. Haller exchanged a total of 13 letters with Voltaire, in which the fundamental differences between the two antipodes nevertheless barely found expression. Much sharper contours become apparent if we examine the many references to Voltaire in the letters Haller exchanged with others. These letters repeatedly refer to inside information, given that Haller corresponded with a total of 73 persons who also corresponded with Voltaire. In January of 1756, after the earthquake in Lisbon in November of 1755 had given Europe a psychological shock, Voltaire was reciting early versions of his poem criticising theodicy in private circles at his residence on the Lake of Geneva. At the same time, Haller was able to follow every detail of the poem's development from the very outset through exchange of letters with trusted correspondents.[112] And when in 1777 Emperor Joseph II paid a visit not to Voltaire in Ferney but to Haller in Bern, Haller relished his triumph throughout Europe, spreading the news of this event in great detail to Geneva, Göttingen, Ingolstadt, Landshut, Lausanne, Stuttgart and Zurich, although he explicitly guarded against saying anything about it in public for fear of being ridiculed.[113]

In the political arena, the letter as a particular vehicle of communication was distinguished on the one hand from closed communication within the municipality and, on the other hand, from the public discourse that was developing in newspapers and journals. When Haller engaged in an intense exchange of letters in the 1760s with his long-time correspondent in Geneva, Charles Bonnet, concerning the political unrest there, Bonnet asked him numerous times to take extreme care in handling these

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[112] Martin Stuber, 'Divine Punishment or Object of Research? The Resonance of Earthquakes, Floods and Famine in the Correspondence Network of Albrecht von Haller', in Michael Kempe and Christian Rohr (eds.), *Coping with the Unexpected—Natural Disasters and Their Perception*. Special issue *Environment and History* 9 (2003), 173–193.

[113] Stuber, Hächler and Steinke 2005 (note 100), 167–169.

Fig. 8. The Emperor's Joseph II visit to Haller in 1777, woodcut after a drawing by G. Roux, mid-19th century. Burgerbibliothek Bern.

letters. Revealingly, Bonnet gave Haller his permission to publish his letters in the planned edition of French letters only under the condition that all passages referring to the Republic of Geneva be omitted.[114]

Advising and Serving: The Function of Experts

Analogous multilayered communication can be found in the area of "advising and serving". Public perception within the European Republic of Letters of Haller's decision to return to Bern in 1753 and assume a position as town hall administrator [Rathausammann] was largely negative and characterised by ridicule, as it was seen as a step backwards in the career of this university professor with European-wide renown. Examination of the intense exchange of letters that Haller conducted with Bern while still in Göttingen reveals how strongly he himself desired this change and how he tried to engineer it by every means at his disposal. His aim was to ensure membership in the patriciate of Bern for himself and his family,

[114] André Holenstein, 'Das Leiden des Gelehrten an der Demokratie', *UniPress (University of Bern)* 135 (2007), 24–25; Stuber, Hächler and Steinke 2005 (note 100), 57.

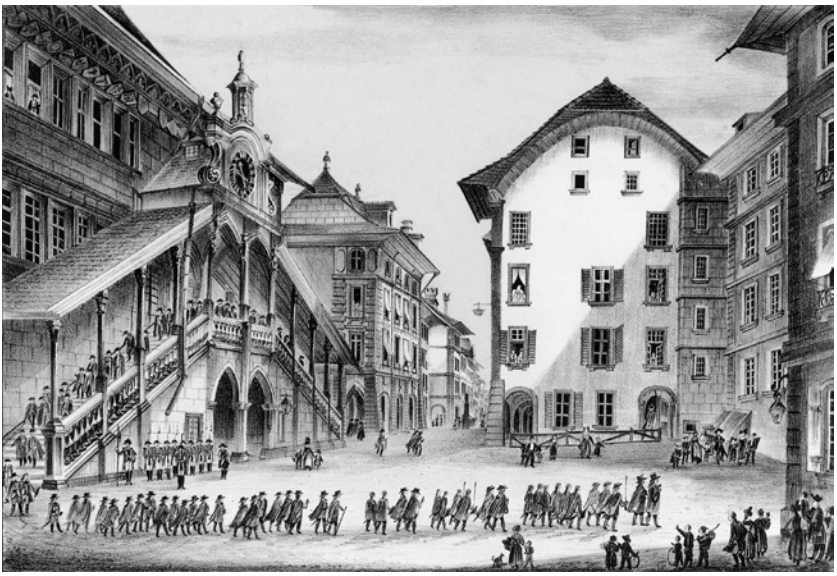

Fig. 9. *L'Hôtel de Ville de Berne* (town hall), lithograph, around 1850, after a drawing from the late 18th century. Historisches Museum Bern.

which could only be done by becoming a member of the Great Council; this in turn would open the door to remunerative public offices.[115] Haller's letters from the period during which he directed Bern's salt works in Roche convey a subjective view of the Bernese administration, thus complementing classic writings on public administration.[116] During his later period in Bern, in the correspondence he conducted as an exponent of the Economic Society of Bern, Haller discussed agrarian-economic innovations for reducing the susceptibility of society to crises and, together with his cousin Samuel Engel, expressed his paternalistic view of the grain policy pursued by the authorities.[117] When exchanging dried plants and

[115] Urs Boschung, 'Albert de Haller ambivalent: réussite scientifique à l'étranger ou réussite sociale dans la patrie', *Révue Médicale de la Suisse Romande* 112 (1992), 1051–1059; Martin Stuber and Stefan Hächler, 'Ancien Régime vernetzt. Albrecht von Hallers bernische Korrespondenz', *Berner Zeitschrift für Geschichte und Heimatkunde* 62 (2000), 125–190: 145–159.

[116] Stuber and Hächler 2000 (note 115), 165–174.

[117] Martin Stuber and Regula Wyss, 'Der Magistrat und ökonomische Patriot', in Steinke, Boschung and Proß 2008 (note 1), 347–380; Martin Stuber, '"Vous ignorez que je suis cultivateur." Albrecht von Hallers Korrespondenz zu Themen der Oekonomischen Gesellschaft Bern', in Stuber, Hächler and Lienhard 2005 (note 1), 505–541.

seeds throughout Europe, he was interested in their economic utilisation.[118] In his function as a Bernese public health official [Sanitätsrat] he bypassed the euphemistic official information policy relating to the pestilence advancing from Eastern Europe in 1771/1772 by directly obtaining detailed information about its current extent from his correspondents in Berlin, Breslau, Lübeck and Vienna; during the cattle plague that spread across Europe in 1772/1773, he corresponded by letter with international experts as well as with local specialists.[119]

A Plea for a Transversal History of Scholarship and Science in the Early Modern Period

If we are to have a history of scholars and of scholarship that is informed by cultural studies, then scholars must be taken seriously as actors who did not simply produce academic knowledge and learned writings but who were integrated in many types of social, cultural, communicative, economic and political contexts, with regard to both their individual personalities and their practices. According to this concept, the history of scholars and the history of science in general cannot be pursued merely as a history of ideas and discourse. The aim must be a history of scholarly culture that leaves behind the narrow confines of self-satisfying, pedantic research on the scholarly world and its microcosm. A step in this direction could be made through consistent and transversal integration of scholarly practices and lifeworlds in the processes and structures of the eighteenth century. With reference to the eighteenth century in particular, the history of scholarly knowledge should not fail to link up with the main debates in historical research on the early modern period.[120] Three research contexts in particular should be considered in this regard.

1) With regard to study of the development of the early modern and the modern state, questions about the specific function of scholarly knowledge

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[118] Martin Stuber and Luc Lienhard, 'Nützliche Pflanzen. Systematische Verzeichnisse von Wild- und Kulturpflanzen im Umfeld der Oekonomischen Gesellschaft Bern 1762–1782', in Holenstein, Stuber and Gerber-Visser 2007 (note 71), 65–106.

[119] Stuber and Hächler 2000 (note 115), 174–178; Martin Stuber and Regula Wyss, 'Die Bekämpfung der Viehseuche 1772/73', in André Holenstein et al. (eds.), *Berns goldene Zeit. Das 18. Jahrhundert neu entdeckt* (Bern 2008), 71–73; see Hubert Steinke and Urs Boschung, 'Nützliche Medizin. Theorie und Praxis bei Albrecht von Haller', in Holenstein, Stuber and Gerber-Visser 2007 (note 71), 133–147.

[120] Füssel 2007 (note 4), 288f.

in the conception and implementation of governmental and administrative activity, as well as in bringing military power into effect, should be posed more consistently than has previously been the case. Following up on research into the role played by scholars in the origins of territorial administration in the medieval period,[121] questions should be posed with regard to the eighteenth century about how and in which sectors scholarly knowledge was invested in developing state structures; to what extent statisticians, mathematicians, cameralists, engineers, botanists, astronomers, cartographers and topographers were systematically employed in order to obtain pertinent knowledge and to rationalise state activities and make them effective; and how the implementation of their scholarly knowledge took place in concrete political-administrative contexts and in military and war-related contexts.[122]

2) A second research context to be considered in an integrated history of scholarship is the connection between the history of science and research on the Enlightenment. Diametrically opposed positions have been advanced in this respect, particularly in Anglo-American academic research.[123] One approach, following Peter Gay, has focused on the different spheres in which representatives of the Republic of Letters and Enlightenment protagonists operated. Recently, however, Laurence Brockliss has warned against declaring the French "philosophes" alone to be the defining representatives of the Enlightenment and, as a result, overlooking the many overlaps and interfaces between the world of scholarship and the world of the Enlightenment.[124] Brockliss has listed the questions that

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[121] Christian Hesse, *Amtsträger der Fürsten im spätmittelalterlichen Reich. Die Funktionseliten der lokalen Verwaltung in Bayern-Landshut, Hessen, Sachsen und Württemberg 1350–1515* (Göttingen 2005).

[122] Gillispie 1981 (note 75); Gascoigne 1994 (note 75); id. 1998 (note 75); Drayton 2000 (note 75), 1–81; Daniel R. Headrick, *When Information Came of Age. Technologies of Knowledge in the Age of Reason and Revolution 1700–1850* (Oxford 2000); Kenneth J. Banks, *Chasing Empire Across the Sea. Communications and the State in the French Atlantic, 1713–1763* (Montreal 2002); Gillispie 2004 (note 75); Edward Higgs, *The Information State in England. The Central Collection of Information on Citizens since 1500* (Basingstoke 2004), 28–63; Kelly DeVries, 'Sites of Military Science and Technology', in Park and Daston 2006 (note 10), 306–319; Arndt Brendecke, Markus Friedrich and Susanne Friedrich (eds.), *Information in der Frühen Neuzeit. Status, Bestände, Strategien* (Münster 2008).

[123] Brockliss 2002 (note 25), 1–19; Roy Porter, 'Introduction', in id. 2003 (note 10), 1–20; Peter Hanns Reill, 'The Legacy of the "Scientific Revolution". Science and the Enlightenment', ibid., 23–43; Brockliss 2003 (note 23), 80f.

[124] Brockliss 2002 (note 25), 8. J.G.A. Pocock argued similarly against the concept of "The Enlightenment" as a unified phenomenon and convincingly described Edward Gibbon's activities and life in various spheres of Enlightenment. See his *Barbarism and Religion*, vol. 1: *The Enlightenments of Edward Gibbon, 1737–1764* (Cambridge 1999), 6–10.

need to be asked in this context: how and where did both these worlds communicate and interact with each other? Did this interaction take the form of a symbiotic process or of one-way communication? Did the world of scholars change after coming into contact with the programmes and the discourses of the Enlightenment?[125] With a view to the situation in France, Brockliss has warned against underestimating the culture of the Republic of Letters in terms of its importance in paving the way for the post-revolutionary order.[126]

3) Finally, attention must be given to economic history or, more precisely, to the history of agrarian reform, industrialisation, the global expansion of European overseas trade, and economic take-off in general. In recent years the question of the cultural causes and prerequisites of economic change in general, and of the Industrial Revolution in particular, has been brought to the fore. Inquiring into the cultural prerequisites of economic modernisation means, for example, examining the development of a scientific and instrumental understanding of nature. But it also involves focusing on critical interfaces and the transfer of knowledge between mechanics, technicians and engineers, on the one hand, and entrepreneurs, on the other hand, as the two key groups of actors involved in mechanisation of the economy in the eighteenth century.[127] By posing such questions, the history of science will become concerned with very worldly and practical matters. It will thus have to turn away from the heroes of science to consider those actors who brought about the merging of useful technical knowledge and the spirit of entrepreneurship:

> The challenge for the historian is to figure out how and why mechanical knowledge and ways of thinking were taken up, or generated by, eighteenth century Westerners with entrepreneurial interests. Rather than looking for the Newtons, or later the Laplaces, [we should focus] . . . less on scientific genius and more on the nature of the cultural values and matrices that fostered application and disciplined curiosity.[128]

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[125] Brockliss 2002 (note 25), 12f.

[126] Ibid., 18f. and 403ff.

[127] Gillispie 1981 (note 75), 335–548; Jacob 1988 (note 21); id., *Scientific Culture and the Making of the Industrial West* (New York 1997); Joel Mokyr, *The Gifts of Athena. Historical Origins of the Knowledge Economy* (Princeton 2002); Margaret C. Jacob and Larry Stewart, *Practical Matter. Newton's Science in the Service of Industry and Empire 1687–1851* (Cambridge 2004); Harold J. Cook, *Matters of Exchange. Commerce, Medicine, and Science in the Dutch Golden Age* (New Haven 2007). For a discussion of Mokyr's contribution, see Maxine Berg, 'The Genesis of "Useful Knowledge"', *History of Science* 45 (2007), 123–133.

[128] Jacob 1997 (note 127), 9.

PART ONE

CLIMBING AND GAINING RECOGNITION: THE CAREER OF THE SAVANT

TRANSNATIONAL CAREERS IN THE SERVICE OF EMPIRE: GERMAN NATURAL HISTORIANS IN EIGHTEENTH-CENTURY LONDON

Thomas Biskup

In the night of 6 March 1754, the Saxonian literary critic and natural historian, Christlob Mylius, died of pneumonia in London, aged 36 years. He bequeathed only 36 shillings in cash, but outstanding debts of £120. For Mylius, London was supposed to have been only an intermediate stop on his way to America, where he first wanted to explore the British-dominated North, and then go on to Dutch Surinam to send back botanical specimens, astronomical data, and descriptions of the fauna and native peoples to Germany. With Mylius's death, a unique expedition project of German natural history came to a premature end. Under the leadership of some of the most renowned German-speaking scholars of the day, such as the Göttingen professor of medicine, Albrecht von Haller, and the Berlin philosopher Johann Georg Sulzer, a group of donors had formed an association with the aim of sending an explorer—quasi in the name of German scholarship as a whole—beyond the borders of Europe and across the oceans. This project, however, was ill-fated from the start: initially, it had been unclear where the explorer was to be sent in the first place, and immediately before his departure, Mylius was diverted from East India to the Americas. Playing the role of future globetrotter in the drawing rooms of North Germany and the Netherlands, Mylius took six months just to travel from Göttingen to London, where he then spent another seven months visiting theatres and translating various pieces. The explorer and his heterogenous community of donors were not bound by a contract, nor did Mylius have a contact person in London that could assist and supervise his preparations for departure and his acquisition of the required equipment. As a consequence, the funds were already spent before Mylius had even left Europe, and his patron Haller was, to a degree, relieved that the failed explorer's death put an end to this embarrassing affair.[1]

[1] Dieter Hildebrandt, *Christlob Mylius. Ein Genie des Ärgernisses* (Berlin 1981).

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Imperial Dependencies: German Natural History and Knowledge Production in the Age of European Expansion

The Mylius expedition was to remain the last attempt of German natural historians in the eighteenth century to organise an independent expedition as a group. It highlights the difficulties of scholars employed at the universities, academies, and courts of the Holy Roman Empire in gaining first-hand experience observing the extra-European world, the exploration of which became a central theme of scholarly as well as popular literature in the course of the eighteenth century. Until the mid-nineteenth century, German states, after all, were land-locked or had no naval resources to speak of. Much of Germany's coast was under the control of Denmark and Sweden, and Hanover was essentially a British subsidiary power from 1714 on. The attempts of Germany's leading powers, the Habsburg Monarchy and Brandenburg-Prussia, to establish themselves as naval powers and gain a share of the Asian and African trade, had been abandoned early in the eighteenth century, and for the remainder of the century, Prussia and Austria concentrated on expanding their military presence on land. This conditioned the way Germans experienced the extra-European world. Far into the nineteenth century, a pattern of "mediated experience" was continued—a pattern that had been a feature of the way German travellers, explorers, and soldiers experienced the wider world for a long time. German gunners had staffed Portuguese ships in the early sixteenth century; German secretaries had served the Dutch East India Company in the seventeenth century, and in Venetian, Dutch and British pay, German soldiers fought all over the globe, from the Eastern Mediterranean to Cape Town, America and India. In particular in the eighteenth century, this also resulted in a rich literature of memoirs that came to occupy an important place in Germany's burgeoning public sphere.[2]

For natural historians based in Germany, however, this increasingly posed a problem. While throughout the eighteenth century the exploration of extra-European territories became increasingly important for the natural sciences, German scholars remained reliant on their correspondence

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[2] Roelof van Gelder, *Das ostindische Abenteuer—Deutsche in Diensten der Vereinigten Ostindischen Kompanie der Niederlande 1600–1800* (Hamburg 2004); Peter Wilson, 'The German "Soldier Trade" of the Seventeenth and Eighteenth Centuries: A Reassessment', *International History Review* 13 (1996), 757–792. For a survey, see Joan-Pau Rubiés, *Travellers and Cosmographers: Studies in the History of Early Modern Travel and Ethnology* (Aldershot 2007) and, very briefly, Gisela Graichen and Horst Gründer, *Deutsche Kolonien—Traum und Trauma* (Berlin 2007), 13–24.

networks and travel reports published elsewhere. The reliability of travel reports, however, was notoriously difficult to assess, and remained a matter of debate throughout the period, although natural historians, including Buffon, continued to use them. The more important first-hand observation became in the hierarchy of epistemological paths, the more precarious the role of travel reports became.[3] Hand in hand with the new role given to first-hand observation, the rank and prestige of the travelling explorer increased: following their return from their first South Sea voyage in 1771, James Cook and Joseph Banks became not only celebrities in Britain, but throughout Europe.[4] Banks, indeed, built his entire career that led to the presidency of the Royal Society, on this voyage.[5] After the Seven Years War, and with the relative decline of the Netherlands and Spain, the great powers Britain and France led the exploration of the Indian and Pacific Oceans, and Russia began to explore the Eurasian land mass.[6] The South Sea came to occupy a particular place in the decades following the Seven Years War—both as an erotically charged utopia where European (male) fantasies of a class-less society and free love were located, and as a scientific challenge, as the descriptions and objects explorers such as Cook and Bougainville brought back from the South Sea raised doubts about many assumptions and theories that had been put forward by natural historians.[7] The geology, flora, fauna and human population of the Pacific, after all, were not easily integrated into the existing systems of classification as, for instance, South Sea plants could not be classified among any of the species known at that time, nor could the Pacific islanders be classified as one of the four "varieties" of the human race, which formed the basis of the natural history of man.[8]

British and French-led exploration was closely linked to imperial projects, which also determined the way expeditions were conducted: they were not primarily, or exclusively, of a scholarly nature; rather, economic

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[3] Lorraine Daston, 'On Observation', *Isis* 99 (2008), 97–110: 102.

[4] Gananath Obeyesekere, *The Apotheosis of Captain Cook: European Mythmaking in the Pacific* (Princeton 1992).

[5] John Gascoigne, *Joseph Banks and the English Enlightenment: Useful Knowledge and Polite Culture* (Cambridge 1994).

[6] Dittmar Dahlmann, Anna Friesen and Diana Ordubaldi (eds.), *Carl Heinrich Merck: Das sibirisch-amerikanische Tagebuch aus den Jahren 1788–1791* (Göttingen 2009).

[7] Christiane Küchler Williams, *Erotische Paradiese: Zur europäischen Südseerezeption im 18. Jahrhundert* (Göttingen 2004).

[8] Hans-Jürgen Lüsebrink, 'Wissen und außereuropäische Erfahrung im 18. Jahrhundert', in Richard van Dülmen and Sina Rauschenbach (eds.), *Macht des Wissens: Die Entstehung der modernen Wissensgesellschaft* (Köln 2004), 629–653.

and political gain stood at the forefront.[9] This economic and political dimension also determined the practice of exploration; despite exchanges in the republic of letters, national and imperial demarcations were becoming increasingly important. The French conceived their expeditions as national projects, and the British, in turn, never employed any Frenchmen. Rather, they turned to Protestant scholars in the smaller German and Scandinavian states. If German-based scholars, in contrast, wished to play a role in botany or anthropology, they needed to establish access to the political as well as scholarly establishment of the naval powers first of all. This also highlights that the image of the republic of letters as a peaceful alternative to the aggressive world of politics, shaped by respect for the force of the better argument, has rightly been long refuted by Robert Proctor and others.[10] In recent studies, questions of rank and prestige, utility and demarcation have been placed at the centre of a history of scholarliness that emphasizes the mutual dependencies of the production of knowledge and socio-economic change.[11]

This chapter will examine how German and English scholars combined their particular resources and qualifications to meet these challenges of natural history. The particular focus will be on German natural historians in the service of the British Empire. This approach, focusing on scholarly practices rather than the contents of publications, takes its cue from recent research into the genesis of early modern and modern cultures of knowledge, which focuses less on theories and ideas—and certainly not on the insights of "great men", the sequence of whom is then supposed to constitute scholarly "progress".[12] Rather, the categories of patronage and hierarchy, the practices of taxonomy and scholarly sociability and the configurations of the European republic of letters and imperial expansion will be used to ask how the world of natural history functioned, and how the production of knowledge and the working of scholarly, social and political institutions were linked. The present chapter thus aims to contribute to reconstructing the culture of knowledge as a cultural practice; an approach that is interested less in the result, the "discovery", of scholarly activity, than in the processes generating knowledge, essential parts of which are

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[9] John Gascoigne, *Science in the Service of Empire: Joseph Banks, the British State and the Uses of Science in the Age of Revolution* (Cambridge 1998), 166–198.

[10] Robert Proctor, *Value-free Science? Purity and Power in Modern Knowledge* (Cambridge 1991).

[11] Marian Füssel, *Gelehrtenkultur als symbolische Praxis: Rang, Ritual und Konflikt an der Universität der Frühen Neuzeit* (Darmstadt 2006).

[12] Ibid., 24.

scholarly exchange and the formation of networks.[13] This blends with a current fresh perspective on later eighteenth-century natural history, the practice of which was dominated by collections. This practice had contributed to the marginalization of this period in the history of science which, until the 1990s, remained primarily interested in laboratories and experiments.[14] No wonder then that aristocratic collectors, such as Joseph Banks, were sidelined as corrupt obstacles to "real" innovation. In the past two decades, however, collections—"factories of the wise", as they were called by Friedrich Heinrich Wilhelm Martini, the founder of Berlin's *Gesellschaft Naturforschender Freunde*[15]—have come to occupy a central place in research, and are now considered important spaces of an observing, ordering and experimenting natural history. Rather than assigning objects a permanent place, eighteenth-century collections were spaces as well as instruments of a scholarly exchange that always had aims other than taxonomical ones.[16] All collections, after all, were places of exchange as well as of communication, for instance as meeting places of scholarly associations. Collections and libraries were at the centre of scholarly networks; they were places where objects were exchanged, and where people met not only on a local, regional or national but also a transnational level.

Anglo-German Scholarship Networks between Holy Roman Empire and British Empire

However, we know surprisingly little about the structures that conditioned exchange between English and German natural historians in the second half of the eighteenth century.[17] This can be blamed partly on the negative

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[13] Helmut Zedelmaier and Martin Mulsow, 'Einführung', in Helmut Zedelmaier and Martin Mulsow (eds.), *Die Praktiken der Gelehrsamkeit in der frühen Neuzeit* (Tübingen 2001), 1–8.

[14] Nicholas Jardine, 'Sammlung, Wissenschaft, Kulturgeschichte', in Anke te Heesen and Emma Spary (eds.), *Sammeln als Wissen: Das Sammeln und seine wissenschaftsgeschichtliche Bedeutung* (Göttingen 2001), 199–220: 214.

[15] Anke te Heesen, 'Vom naturgeschichtlichen Investor zum Staatsdiener. Sammler und Sammlungen der Gesellschaft Naturforscher Freunde zu Berlin um 1800', in te Heesen and Spary 2001 (note 14), 62–84: 62.

[16] Staffan Müller-Wille, 'Botanischer Tausch und Ökonomie der Natur', in Regina Dauser et al. (eds.), *Wissen im Netz. Botanik und Pflanzentransfer in europäischen Korrespondenznetzen des 18. Jahrhunderts* (Berlin 2008), 79–89.

[17] Michael Hoare's remarks on the lack of works in this field are still valid: Michael Hoare, 'Introduction', in Michael Hoare (ed.), *The Resolution Journal of Johann Reinhold Forster, 1772–1775* (London 1982), vol. 1, 1–122: 21.

view of the later eighteenth century that had long dominated British narratives of the history of science, and partly on the way the history of the British Empire as a whole has been written, and is still being written. First, the perceived decline of the Royal Society, and of English scholarship as a whole, after the "heroic" age of Newton and his colleagues, has, in the last decade or two, been challenged, and historians now emphasise that the epistemological changes that marked the transition to the modern world cannot be understood without considering the practice of natural history in the eighteenth century. Secondly, "Atlantic history" has highlighted the interdependencies of imperial "centre" and "periphery".[18] This approach has shown the interconnectedness of the first British Empire in particular in fields such as trading networks or, as Mary Sarah Bilder has recently demonstrated, law, where she identified a "transatlantic constitution".[19]

The field of knowledge formation, however, has always transcended political-legal borders, although of course political and social structures as well as military and economic rivalry also shaped what intellectual historians now call "cultures of knowledge". Historians of science have demonstrated how imperial exploits fostered British pride, and formal and informal connections between scholars and the state have been explored by a historiography analysing the dense webs of politics, patronage, and scholarship that organised the ways information and objects were gathered all over the world and brought to London or Paris. Through the series of studies by John Gascoigne on Sir Joseph Banks, by Richard Drayton on empire, botany and gardening, Lisbet Koerner on Linnaeus, and Emma Spary on French natural history between Old Regime and Revolution, it has become apparent how in Britain, Sweden, and France powerful patrons based in metropolitan institutions and personal networks wielded power at the intersection of national politics and scholarship, thereby contributing to the expansion of Empire as well as the creation, or strengthening, of national identities.[20] All these studies examine the ways in which information—reports, images, and specimens—flowing back from various parts of the Empire was transformed into knowledge back in the capital, thereby demonstrating how crucial the "periphery" was for the formation

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[18] Bernard Bailyn, *Atlantic History: Concept and Contours* (Cambridge 2005).

[19] Mary Sarah Bilder, *The Transatlantic Constitution: Colonial Legal Culture and the Empire* (Cambridge 2004).

[20] Richard Drayton, *Nature's Government: Science, Imperial Britain and the Improvement of the World* (New Haven 2000); Lisbet Koerner, *Linnaeus: Nature and Nation* (Cambridge 2000); Emma Spary, *Le jardin d'utopie: l'histoire naturelle en France de l'Ancien Régime à la Révolution* (Paris 2005); for the work of John Gascoigne, see notes 5 and 9.

of attitudes, values, and identities at the "centre". However, by putting the emphasis on the interrelationship between imperial "periphery" and "centre", these studies tend to exclude other variables, in particular other European centres of scholarship. Despite imperial rivalry and national pride, after all, communication between European scholars remained the bedrock of scholarship, but there is still a need to explore how the imperial and Atlantic connection on the one hand, and European scholarship on the other, were entwined. In his study of "imperial botany", Richard Drayton points out how much of Banks's work at Kew was fired by imperial rivalry with France, and informed by German cameralism, but the search for foreign intellectual "influences" should not cause us to overlook the much more direct ways in which British and continental scholars cooperated. Thus, more can be done to go beyond the relationship of Britain and its colonial "outposts", and to further integrate the British Empire into a wider European framework as well. In this respect, Atlantic history needs to be careful not turn into a new, and methodologically up-to-date, edition of the old British history, which emphasised the particularities of the British Isles and in particular the English *Sonderweg* [peculiar path]. Mainly the connections between British and French scholars have found scholarly attention.[21] In contrast, the connections between England and Germany have remained largely unexplored. We know a lot about the important role Britain played for eighteenth- and nineteenth-century Germany; in particular the phenomenon of Anglophilie, the German image of England as a model of political "freedom", economic prosperity, and sociable culture. Little is known, however, about the role Germany played for England.

Early modern scholarship was a European phenomenon, and in the network of academies and universities, scholarly associations and individual scholars, international epistolary exchange formed the basis of scholarship in all fields despite persisting confessional divides and emerging national rivalries. Exchange between German lands and England had always been determined by confessional proximity, and it had thus been the Holy Roman Empire's Protestant territories and Switzerland that built up particularly close links with England during the early Enlightenment.[22] Throughout the eighteenth century, this confessional

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[21] Ann Thomson, Simon Burrows and Edmond Dziembowski (eds.), *Cultural Transfers: France and Britain in the Long Eighteenth Century* (Oxford 2010).

[22] Stefan Siemer, *Geselligkeit und Methode. Naturgeschichtliches Sammeln im 18. Jahrhundert* (Mainz 2004), 65–73.

dimension remained as important as political links. After the Cromwell years, scholarly exchange between Switzerland, Germany, in particular the Protestant North, and England re-emerged: Johann Jakob Scheuchzer developed his diluvial theory in close co-operation with English scholars,[23] and in the later seventeenth and early eighteenth centuries, a number of Lutheran theologians complemented their studies with a stint at Oxford. Among them were the Prussian court preacher and president of the Berlin Academy, Daniel Ernst Jablonski, who studied at Oxford between 1680 and 1683; and the Brunswick court preacher Johann Friedrich Wilhelm Jerusalem, who was at Oxford in the 1740s.[24] Both were closely associated with the "enlightened" branch of Lutheran theology, which became so important for the spread of *Aufklärung* in eighteenth-century Germany, but never gained much influence within the Church of England. Also, the leading representative of "enlightened" Protestant theology, Johann David Michaelis, made his first English contacts in this tradition when spending a year at Oxford as a student. He later used this as a stepping stone towards a close and long-term involvement with the English world of scholarship, which would mark a new phase in Anglo-German scholarship. This had less to do with the personal union between Hanover and Britain after 1714 as such. Rather, it was a matter of the particular institutional and communicative framework provided for the integration of German and English scholars.

Here, the role assumed by the brand-new University of Göttingen in the European world of scholarship within the first three decades after its founding in 1737, is central.[25] Originally established to provide a training ground for the civil servants and clergy of the electorate of Hanover, it very soon gained a reputation as the leading research university among the 33 universities of the Holy Roman Empire; in the second half of the century it became—as one historian of science has called it—*the* university of the age of Enlightenment, an institution the entire European republic of letters looked to. It was tightly controlled by the state; indeed,

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[23] Michael Kempe, *Wissenschaft, Theologie, Aufklärung: Johann Jakob Scheuchzer (1672–1733) und die Sintfluttheorie* (Epfendorf 2003).

[24] See now Joachim Bahlcke and Werner Korthaase (eds.), *Daniel Ernst Jablonski: Religion, Wissenschaft und Politik um 1700* (Wiesbaden 2008); Klaus Erich Pollmann (ed.), *Abt Johann Friedrich Wilhelm Jerusalem (1709–1789): Beiträge zu einem Colloquium anläßlich seines 200. Todestages* (Braunschweig 1989).

[25] This section is based on Thomas Biskup, 'A University for Empire? The University of Göttingen and the Personal Union, 1737–1837', in Brendan Simms and Torsten Riotte (eds.), *The Hanoverian Dimension in British History* (Cambridge 2007), 128–160.

it was a department *of* the state, but unlike many earlier institutions, including the English universities, it was open to students from *all* confessions in typical Enlightenment spirit. The Hanoverian government, in the person of leading minister Gerlach Adolph von Münchhausen, made a point of appointing a number of highly renowned professors in Law, theology, and medicine. Göttingen was strong not only in law, in particular Imperial Law, the knowledge of which was of course a prerequisite for any diplomatic career in central Europe. It was, above all, strong in those subjects that had traditionally been excluded from the university curriculum: reform theology and natural history, much of which was elsewhere taught only at specialist training colleges, such as the Freiberg mining institute. While a number of continental universities, such as Uppsala, Halle or the Dutch universities, had opened up to these fields in the late seventeenth century, and the Scottish universities were to follow, the two English universities in particular remained essentially theological colleges. Thus, natural history was increasingly conducted outside the universities in eighteenth-century England, in voluntary associations dominated by gentleman scholars, such as the Royal Society.

Building Up a Special Relationship: Göttingen and London, 1760s to 1780s

How, in this intellectual and institutional context, transnational scholarship networks operated, will be demonstrated in what follows by the examples of Sir Joseph Banks and Johann Friedrich Blumenbach. They built on the connections established in the 1760s and 1770s by Michaelis, who had been keen to put Bible Studies on a scientifically sound footing. He stood at the forefront of the re-appraisal of biblical and mythological texts, which was one of the most-discussed problems of the eighteenth century, and signalled a major shift in the representation of the past. Of central importance was the question to which degree Scripture could be taken as a source book on "real" events of the past, or if not, then rather as a source book from which the mind-set of ancient peoples could be reconstructed. Considering that the interpretation of Scripture was central to politics and society in the eighteenth century, when in all European states the Church was still a state church and controlled most levels of the educational systems, this was an eminently political project that stood at the crossroads of several disciplines. Michaelis thus worked closely with scholars in philology and philosophy, geography and ethnography, and

here in particular, with English scholars who belonged to the king's and queen's scholarly circle. This group included, among others, the Bishop of Oxford, Robert Lowth, Robert Wood, politician and famous traveller to the Near East, and Sir John Pringle, President of the Royal Society, court physician, government adviser in scientific matters, correspondence partner of Haller's, and an avid reader in theology. He was the unofficial head of this circle and Michaelis's most important correspondence partner since the mid-1760s, when Pringle had visited Göttingen with his friend Benjamin Franklin, when both were elected to its Academy of Sciences. Unlike biblical philology and chronology, which had for a long time been the domain of Bible scholars, scholarship of the Michaelis-Pringle mould also included the organisation of expeditions to the Near East to gain first-hand reports on the geography, botany, and ethnography of the Holy Land, to be able to establish the factual correctness of data provided by the Bible. Pringle and Haller also closely followed Cook's voyages to the South Sea.[26] Like Banks a decade later, Pringle corresponded with a number of Göttingen experts, and divided his correspondence according to fields of interest, writing to Albrecht von Haller on medical matters, and to Michaelis on theology. This required a certain amount of diplomatic skill, as Haller and Michaelis did not always get on well. Pringle corresponded extensively with people all over Europe, but with Albrecht von Haller and Johann David Michaelis, his two most important correspondents were Göttingen men. Pringle, in turn, was one of the most important correspondence partners of both Michaelis and Haller in Britain.

Michaelis had made his reputation by organising Niebuhr's Arabian expedition of 1761, and in the following decades, he remained closely involved in similar projects, which were organised with the help of London's scientific associations, for instance the Society of Dilettanti, which was instrumental in publishing the results of Robert Wood's travels to Greece and Turkey. Thus, Michaelis became one of the founding figures of what later emerged as "oriental studies" from under the umbrella of theology, and his *Orientalische Bibliothek*, the first scholarly journal dedicated to oriental studies, also served as a model for the *Asiatick researches* published by London's Asiatic Society. Michaelis's work was thus not only situated at the crossroads of several disciplines; indeed, it contributed to the emergence of new disciplines. It was also situated at the crossroads of pol-

[26] Otto Sonntag (ed.), *John Pringle's Correspondence with Albrecht von Haller* (Basle 1999), 11.

itics and scholarship, and high patronage was thus paramount. Thus, close connections to the court and the government of Lord North were essential, which after Pringle's death in 1782 were maintained through the Bishop of Winchelsea, Lord North's brother. No wonder then that Michaelis feared for his connections when the North government ended, as Michaelis's political patronage in London was also a party political matter.[27]

Joseph Banks was elected president of the Royal Society in 1778, mainly due to the reputation he had gained as a travelling botanist on James Cook's first South Sea voyage. He published only a small number of scientific papers but exerted enormous influence over decades through his extensive correspondence, his proximity to king and court, and an enormous number of offices: he was founding director of the Royal Botanic Garden, an influential board member of many scholarly associations, and the most important trustee of the British Museum.[28] Banks's connections were of particular interest to Johann Friedrich Blumenbach, who was professor of anatomy at Göttingen but whose research interests went far beyond what had hitherto been considered the domain of medicine: he made Göttingen a centre of ethnography, and was a key figure in the establishment of the new science of anthropology.[29]

For these comparative projects in botany and anthropology, which aimed at nothing less than the creation of new systems of classification comprehending all species on earth, the acquisition of large collections of specimens was necessary. This went far beyond the exchange of letters and the odd "curious" piece, as in the collection of Sir Hans Sloane in the seventeenth century. Rather, systematic observation and the acquisition of specimens from all corners of the globe were required. Banks built up huge collections in his large house in London's Soho Square, which he readily used as a reservoir for his contacts with other scholars. Systematically, he built up only his botanical collections, which were based on the classification system developed by Linnaeus (or, as he was rather known on the continent, Linné), whose pupil Daniel Solander he also

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[27] Biskup 2007 (note 25), 146.

[28] The Banks correspondence amounts to more than 20,000 letters, see Harold Carter, 'Introduction', in Neil Chambers (ed.), *The Letters of Sir Joseph Banks: A Selection, 1768–1820* (London 2000), xvii. See also notes 5 and 9.

[29] Thomas Nutz, *"Varietäten des Menschengeschlechts": Die Wissenschaften vom Menschen in der Zeit der Aufklärung* (Wien 2009). For the early correspondence between Banks and Blumenbach, see Frank W.P. Dougherty (ed.), *The Correspondence of Johann Friedrich Blumenbach*, vol. 2: *1783/84* (Göttingen 2007), X and 14ff.

Fig. 1. James Gillray's caricature of Joseph Banks as *South Sea caterpillar* (1795): this highlights the central role his travels had for his reputation at home, Library of Congress (Washington).

employed as a private curator.[30] On the basis of his famous Göttingen collection of human skulls, Blumenbach, in turn, developed his theory on the variety of species, which differentiated Linné's classification and remained the standard work in the field until Darwin revolutionised the world of science again in the mid-nineteenth century.[31] The main contributor to Blumenbach's collection was Banks, who instructed his agents in the South Sea and in Canada, Africa and India to send skulls and other specimens relating to the classification of human beings to London, from where he forwarded them to Göttingen. Banks also provided hundreds of plants to Göttingen's new Botanic Garden. Thus, Göttingen's botanic and ethnographic collections—divided into Natural History of Mankind, Fauna, Flora, and Minerals according to Blumenbach's handbook—were largely based on the findings of Cook's voyages, but also integrated into the network of botanic gardens Banks set up all over the Empire, from London to Trinidad and the Indian Ocean (Ceylon).[32] As a whole, however, Blumenbach focussed on anthropology rather than botany, which in turn was Banks's main field of interest. The two patrons thus divided natural history into two fields, each of them covering one area. Blumenbach provided the expert advice Banks was in need of when it came to categorising and analysing Banks's enormous collections. In Soho Square, Banks already had a host of eminent scholarly retainers employed, and through extensive correspondence, scientific papers, and personal visits, Blumenbach came in here as well.

Blumenbach acknowledged in his letters to Banks that he benefited materially much more from the relationship than his English counterpart, but reciprocity was guaranteed as, crucially, Banks gained access to Blumenbach's expertise as well as his students. This was important precisely because, at a time when British expansion into the South Sea in the decades following the Seven Years War required unprecedented botanical, zoological, astronomical and ethnographic expertise, neither qualified "travellers", as explorers were then called, nor qualified curators were readily available in England. Natural history, as botany, zoology and mineralogy were comprehensively labelled, was not part of the English university curriculum. When young Banks became interested in botany while at Oxford, he needed to pay a private tutor out of his own purse.

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[30] Edward Duyker, *Nature's Argonaut: Daniel Solander 1733–1782. Naturalist and Voyager with Cook and Banks* (Melbourne 1998).

[31] Dougherty 2007 (note 29), XIVf. and XXV.

[32] Gascoigne 1994 (note 5), 150–155.

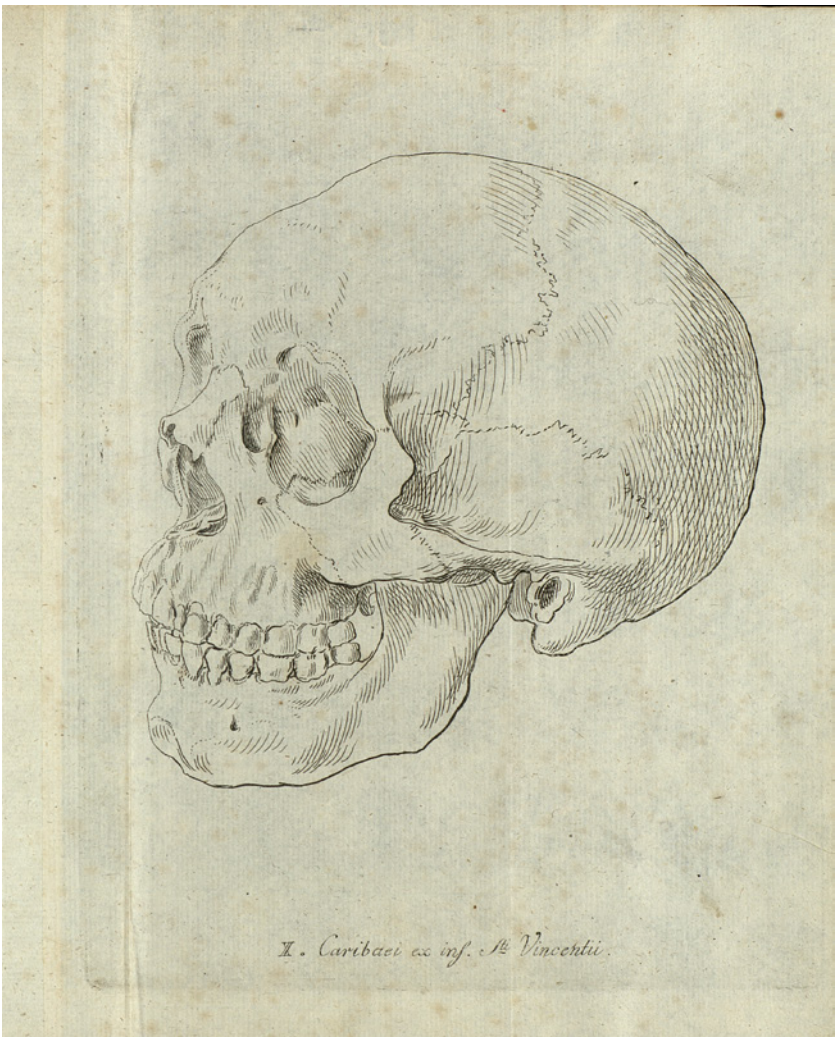

Fig. 2. "Caribaei", from: Johann Friedrich Blumenbach: *Decas Collectionis Suae Craniorum Diversarum Gentium, Gottingae* 1790/1820, 11 [pl. en reg. p. 26: crâne] X.

This turned out to be a good investment as it enabled him to participate in Cook's first South Sea voyage, on which he then built his entire scientific reputation as a leading botanist. When Banks fell out with Cook before the latter's second South Sea voyage, no English talent was at hand to fill the gap. Hence, the father-and-son team Reinhold and George Forster was

employed.[33] The former German-Polish parish priest Forster had been trying for almost a decade to establish himself as a scholar in England. Trying to survive as a tutor for Dissenting Academies, he jumped at the opportunity to join Cook as naturalist aboard the *Resolution* in 1772. After his and his son's return to London, he hoped to emulate Banks in building a career on his scholarly exploits but fell out spectacularly with Banks, Lord Sandwich, and the British establishment over the publication of the travel report (which he and his son wished to pursue on their own, and not on the Admiralty's conditions). Banks's patronage system, however, did not grant the ambitious Forster the position he yearned for. Forster's requests for an annual pension, a donation, and the publishing rights to the official travel report were rejected, and when Forster published his own travel report independently, and engaged in a public row with Lord Sandwich, the First Lord of the Admiralty (and Banks's closest ally in government), the British establishment closed ranks against the immigrant theologian of lowly Polish-Prussian background. Whereas the more elastic Solander had been promoted from Assistant Keeper to Keeper (with a salary of more than £100) at the British Museum following his participation in Cook's first South Sea voyage, Forster had breached the rules of London's scholarly society, and fled Britain, leaving behind a pile of debt. The South Sea voyage that had made his reputation in the first place now appeared as "that fatal voyage which is his ruin", as his son George later wrote.

The powerful baronet Banks was part of a small elite group that influenced almost all decisions when it came to military and trade operations, research trips and the exploitation of new territories, and he was uniquely positioned to guarantee his position as undisputed master of South Sea studies and botany in Britain. Indeed, in contrast to Cook's first South Sea voyage, which was designated the "Banks voyage", the official travel report made sure that Cook's second South Sea voyage came to be called "Cook's voyage", thus highlighting the British navigator at the expense of the German botanist.[34] It is thus particularly ironic that a decade later, Banks conveyed his strategic recommendations to Blumenbach via George Forster,

[33] For the resulting conflict between Forster and Sandwich, Michael Hoare, *The Tactless Philosopher: Johann Reinhold Forster (1729–1798)* (Melbourne 1976), 179–182 is still unsurpassed.

[34] James Cook, *A Voyage Towards the South Pole, and Round the World: Performed in His Majesty's Ships the Resolution and Adventure, in the Years 1772, 1773, 1774, and 1775* (London 1777), 2 vols.

who wrote to his wife Therese: "Banks considers Blumenbach a shining light, and thinks he should lay claim to that skull story, quite as he himself had laid claim to all things South Sea."[35] As late as 1790, Forster was unable to overcome the wall erected by Banks to protect his own field: when visiting England again to publish his research into South Sea botany, George Forster was rejected by all publishers, who were afraid "to displease a man, such as Sir Joseph Banks, who thinks he has the monopoly over South Sea plants", and who might "burden my book with his mighty condemnation."[36] This demonstrates the degree to which informal power structures determined what reached the book market in England, where no official censorship existed. On both sides of the English Channel, scholarly grandees exploited George Forster's knowledge and reputation as a traveller while withholding recognition and patronage when it came to salaried positions. Forster, who had been educated by his father and had no academic degree, was forced to accept an academic post at the remote University of Vilnius, from where he later moved to the courts of Cassel and Mainz. George Forster was used by English as well as German scholars when it came to mediating between Germany and Britain, but he fell through the loops of the very net that he helped to weave.

Explorers and Curators: German Natural Historians in 1790s and 1800s London

While the Forsters needed decades to recover from the financial consequences of this conflict, Banks learned that the lack of scientific talent needed to be addressed systematically. After the Forsters had left in 1780, Blumenbach and Banks thus intensified their co-operation by filling positions in the "imperial" sciences with Göttingen graduates. First, they jointly organised the expeditions of Friedrich Hornemann and Johann Ludwig Burckhardt to Africa and Arabia, to determine the course of the rivers Niger and Nile, and generally send back information relating to botany and zoology as well as to ethnography and geography. Banks, as the leading force of the "Association for promoting the discovery of the interior of Africa", and Blumenbach devised a concept whereby Blumenbach chose able Göttingen graduates in natural history, and provided them with a

[35] Gerhard Steiner (ed.), *Georg Forsters Werke*, vol. 16: *Briefe 1790 bis 1791* (Berlin 1980), 153.
[36] Ibid.

linguistic, geographical, and mathematical training that was designed to allow them to travel alone, which meant in disguise as travelling Muslims, through regions no European had ever set foot in, as well as to maximise their scholarly output. Hornemann and Burckhardt were then sent to London, where Banks and the African Association provided them with the latest geographical information as well as the necessary equipment, and the Royal Navy then organised the transport. Like so many explorers of that period, they all perished, but not before sending back valuable travel reports, which were then published by the Association, and which formed the basis of further explorations in the nineteenth century. Thus, in the decades following the Seven Years War, Britain, the undisputed naval power, came to occupy something of a monopoly when it came to organising overseas expeditions from Germany. While Michaelis still organised his Arabian expedition of 1761 with the help of the Danish court, all German post-war explorations of the Near East and the South Sea were arranged through the London link. Only when even Banks could not secure funds was it necessary to find other paths. Due to the financial difficulties of the African Association, Ulrich Jaspar Seetzen thus had to fall back on a grant provided by the Duke of Saxe-Gotha.[37]

Second, British expansion filled the collections of the newly-established British Museum as well as those of private gentleman-collectors, such as Banks or John Hunter, with an unprecedented number of plants and animals, mineralogical and ethnographic specimens. Due to the lack of home-grown natural historians, however, these collections were largely administered by curators trained abroad: Banks's private collection was in the hands of Linnaeus's pupil Solander, who also served as part-time curator in the chronically understaffed British Museum. Jonas Dryander, another Linnaeus pupil, also worked both for the Banks collection and for public institutions under Banks's control.[38] Through Blumenbach, Banks was now able to place a number of highly-qualified Göttingen graduates in different London collections.

The case of the Brunswick-born Carl Dietrich König is typical. On Blumenbach's recommendation, he was invited to London, where Banks

[37] Hans Plischke, *Johann Friedrich Blumenbachs Einfluß auf die Entdeckungsreisenden seiner Zeit* (Göttingen 1937), 31–38.

[38] Edward Edwards, *Lives of the Founders of the British Museum* (reprint of 1870 edn., Bristol 1997), 532 and 575; P.R. Harris, *A history of the British Museum Library 1753–1973* (London 1998), 36, 48 and 171; Marie Boas Hall, *The Library and Archives of the Royal Society 1660–1990* (London 1992), 17–21.

had him employed to re-organise Queen Charlotte's collections at Kew.[39] There, he also co-edited and contributed to the *Annals of Botany*, one of the ever-increasing number of scholarly journals. Banks later employed him in his own household, which in König's case as in so many others was a stepping stone to an official position in the English world of science. König was thus appointed to the British Museum in 1807, where he catalogued the mineral collections that had been thoroughly neglected by his predecessor George Shaw, who had even been temporarily suspended due to the neglect of his duties. Keeper of the Natural History Department at the British Museum from 1813, and Keeper of the Mineralogical and Geological Branches from 1837, König was also instrumental in bringing about major acquisitions, such as the Greville Collection, bought with the help of a Parliament Grant of more than £13,000 in 1810, and the German collection of the Baron von Moll in 1815; here, the fact that the then Crown Prince of Bavaria had also been an impressed student of Blumenbach's at Göttingen paid off. König worked closely together with another Göttingen graduate, the Museum's principal librarian Joseph Planta, whose years in office transformed the library after it had been left virtually untouched by his predecessor Charles Morton, and certainly uncatalogued, since it had moved into Montague House. The Garrick bequest of plays, the library of George III, the Cottonian library (although acquired earlier), and other major collections were integrated into what later became the British Library under Planta's reign, using cataloguing systems developed by Göttingen University Library, then Europe's leading research library.[40] This transformed a rather random collection of bequests into an "international repository that was truly global in scope".[41]

König's career followed a pattern that had been established two decades previously on Solander's arrival: qualified staff were being shuttled between the collections of London's scholarly grandees quite like the objects of natural history themselves. Thus, Banks exchanged considerable parts of his own collections with fellow collector John Hunter. After the latter's death, his collection was bought "for the nation" by Parliament, and entrusted to the Royal College of Surgeons. It was overseen by a Board

[39] For the role of the Royal court in these aristocratic urban networks, see Jane Roberts (ed.), *George III & Queen Charlotte. Patronage, Collecting and Court Taste* (London 2004).

[40] Philip Rowland Harris, *A History of the British Museum Library 1753–1973* (London 1998), 36ff.; Neil Chambers, *Joseph Banks and the British Museum: The World of Collecting, 1770–1830* (London 2007), 3f., 34–43 and 61–69.

[41] Chambers 2007 (note 40), x–xi.

of Trustees dominated by Banks, who thus found himself again in charge of parts of his own collection. The patronage resources of the Royal court were also integrated into this network: the Silesian philologist Gottfried Woide, for instance, was given the position of Reformed Chaplain at the court of St. James in 1770. Twelve years later, he was appointed Assistant Librarian in the British Museum's Department of Natural History, and the very circumstances of his death highlight the density of Banks's network: in 1790, Woide died of apoplexy in his grace and favour apartment in the British Museum, following a dinner of scholarly sociability at Banks's house.[42]

Subservience and Politeness: Immigrant Curators in London's Aristocratic Collections

A considerable part of the duties of scholars such as Woide and König was of a social nature: they had to entertain Banks's aristocratic guests at his famous Sunday dinners, as well as to function as tour guides for high-ranking visitors in the British Museum, not least Members of Parliament, who repeatedly were asked to approve additional Museum funds. Here, scholarship had to be "useful" as well as "polite", a combination for which the University of Göttingen was particularly well known. The concept of the "polite scholar" not only set the "bookish" antiquary apart from the improving *Aufklärer*; a "perfectly polished behaviour" was also the prerequisite for any success within the hierarchies of a scholarly world dominated by aristocratic grandees.[43] Simultaneously, this shared set of values facilitated trust between scholars, which became a key word for the conduct of natural history. British and German scholars were, to a degree, dependent on each other and the enormous number of forgeries in the age of Enlightenment—from archaeological artefacts to fossils—testifies to the importance of reliability and trust. "Sedentary" scholars such as Michaelis and Blumenbach thus preferred to rely on observers and channels of communication they knew well.[44]

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[42] W.P. Courtney, rev. S.J. Skedd, 'Woide, Godfrey', in *Oxford Dictionary of National Biography* (Oxford 2004), vol. 59, 948.

[43] Robert Huxley, 'Natural History Collectors and Their Collections: "Simpling Macaronis" and Instruments of Empire', in Kim Sloan (ed.), *Enlightenment: Discovering the World in the Eighteenth Century* (London 2003), 88–90.

[44] "Without the ability to place trust in reports of matters of fact that had not been personally experienced by people like oneself, the new philosophy would have remained

This taxonomic as well as sociable practice of scholarship, however, increasingly contrasted with the European republic of letters, which in the second half of the eighteenth century came to measure scholarly achievement by the number and quality of publications, and the link a scholar had with scholarly hypotheses and "discoveries". The scholarly practices of König and Planta resulted in the production of new catalogues, but only few publications in the form of articles published in the Transactions of the Royal Society, and even these were often published under the name of other, more prominent patrons. This not only reduced the visibility of curators in the Republic of Letters, but also their place in the histories of science written in the nineteenth and twentieth centuries. The same practices, however, affected their aristocratic patrons, who did not all contribute to those scholarly publications that Albrecht Haller and other luminaries considered necessary for what was now being called scientific progress. Banks was rejected by the Paris Academy at first owing to a perceived lack of publications, and tried to bolster his position in the Republic of Letters by giving away parts of his collections, but the great botanical work he had long planned never made it to the printing press.[45] In this context, his European correspondence partners took on an important function in safeguarding Banks's status: publications emphasizing Banks's contributions to scholarship, such as Blumenbach's introduction to the third edition of his *De generis humani varietate nativa* (1795), thus served to function as reminders that despite his lack of publications, Banks had contributed enormously to the progress of natural history.

The reciprocity and complementarity of German professors and English collectors did not simply rely on personal arrangements; on the basis of structurally different cultures of knowledge, they rather established a transnational co-operation that far exceeded the exchange practices cultivated by members of the Republic of Letters. While some German universities, such as Göttingen, enjoyed respect all over Europe, it was religion and politics that accounted above all for the eminent position of German natural scientists in eighteenth-century London. In Germany, natural history had a fixed place at the Empire's many universities and academies,

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fragmented and isolated in local social and geographical spaces", David Lux und Harold Cook, 'Closed Circles or Open Networks? Communicating at a Distance during the Scientific Revolution', *History of Science* 36 (1998), 179–211: 181.

[45] David Philip Miller, 'Joseph Banks, Empire, and "centers of calculation" in Late Hanoverian London', in David Philip Miller and Peter Hanns Reill (eds.), *Visions of Empire: Voyages, Botany, and Representations of Nature* (Cambridge 1996), 21–37: 21.

whereas England's most innovative scholarship was not situated at the two ancient universities, but propelled by wealthy gentleman-collectors, whose collections and associations determined the structures of the English culture of science well into the nineteenth century. Incorporating the specimens assembled in these collections into a "body of theory which would make sense of their significance",[46] however, remained a challenge for this brand of decentralised, non-academic natural history, the limits of which were highlighted by Samuel Johnson as early as 1770:

> The virtuoso therefore cannot be saied to be wholly useless; but perhaps he may be sometimes culpable for confining himself to business below his genius, and losing in petty speculations, those hourse by which if he had spent them in nobler studies, he might have given new light to the intellectual world. . . . Collections of this kind are of use to the learned, as heaps of stones and piles of timber are necessary to the architect.[47]

London's scholarly associations, such as the Royal Society or the Society of Dilettanti, were above all gentlemanly clubs serving the cultivation of elite sociability, whereas the actual work of cataloguing and classifying objects was done by scholars on lower social levels.[48] The principle of scholarly meritocracy, according to which "knowledge, achievement and contribution to the progress of science" should determine a scholar's rank, applied in this culture only to a degree.[49] Natural historians from modest backgrounds, such as König and Hornemann, had to be prepared to integrate into hierarchical structures that provided for them materially and guaranteed a certain amount of respectability. Successful curators, such as Solander and König, who had trained with luminaries such as Linnaeus or Blumenbach, were able to use their continental connections as bargaining chips; this was another field where Reinhold and George Forster could not compete. The correspondence of German and Swedish scholars, both with their old continental patrons and their acquired

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[46] Gascoigne 1994 (note 5), 158f.

[47] Quoted in: Roy Porter, *The Making of Geology: Earth Science in Britain 1660–1815* (Cambridge 1977), 169f.

[48] Harry Liebersohn, 'European Geographic Societies and Ethnography (1821–1840)', in Philippe Despoix and Justus Fetscher (eds.), *Cross-Cultural Encounters and Constructions of Knowledge in the 18th and 19th Century: Non-European and European Travel of Exploration in Comparative Perspective / Interkulturelle Begegnungen und Wissenskonstruktionen im 18. und 19. Jahrhundert* (Kassel 2004), 145–160: 150f.

[49] Hubert Steinke and Martin Stuber, 'Haller und die Gelehrtenrepublik', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008), 381–414: 393.

English ones, demonstrates that proximity and distance were continually negotiated to safeguard a salaried position. The functional character of such relations—often remarked upon critically by the powerful, such as Linnaeus—is revealed by the recurring decline in communication once these aims were reached or the balance of patronage resources changed.

For immigrants, however, successful integration into the world of English natural history was only ever possible on a subservient level, with the apex being a salaried curator's, or keeper's, position. These positions were overseen by the same aristocratic trustees who also employed immigrants in their private collections, and continued to call on them once they had moved into public service. This demonstrates yet again that the borders between "public" and "private" collections remained permeable well into the nineteenth century. All this migration, however, never reached the higher social echelons of natural history, and English gentlemen-collectors as well as German professors of Blumenbach's rank would never spend more than a few weeks away from their domestic power bases.

The integration of migrant scholars was, however, not determined by national but by social descent. It affected immigrants as well as those British scholars who had no genteel background. Above all, it appears that natural history, which was structured around large private and public collections, was more hierarchical than other fields, such as astronomy. The career of William Herschel, who rose from immigrant German musician to ennobled court astronomer, would have been inconceivable in that playground of aristocratic ambition, botany. Strict as these hierarchies were, they were, in both correspondence and sociability, masked by a rhetoric of friendship, the translation of which into social equality, however, remained out of bounds. The ethos of friendship, which found expression in the presentation and exchange of objects, thus always needs to be seen in the context of patronage relations.[50]

Religion and Empire: German Scholars in the Age of Anglo-French Antagonism

In eighteenth-century London it was thus less national affiliation than social rank and scholarly ethos that determined the role of German natural historians, many of whom anglicised their Christian names once their

[50] Jardine 2001 (note 14), 216.

migration to Britain turned out to be permanent. Even beyond the Anglo-Hanoverian personal union, religion and politics shaped the career paths of German natural historians: first, the close connection of natural history and theology, which had produced scholars such as Scheuchzer and Linnaeus earlier in the century, became evident even at the turn of the nineteenth century. Upper and Lower Saxony, the Netherlands, Sweden and Switzerland—the traditional corridors of the theological *peregrinatio academica*—continued to facilitate the careers of natural historians until the early 1800s. Secondly, Banks and Blumenbach intensified their co-operation during the 1790s and early 1800s when Britain and France were almost constantly at war; 80 per cent of their letters were written in the few years between 1790 and 1803.[51] This highlights the particular role Anglo-German scholarship networks had in this period: during the 60 years between 1755 and 1815, Britain and France were at war for no less than 34 years, and imperial rivalry shaped in particular the conduct of natural history. Not least among the reasons why Buffon's system of species classification never gained a real foothold in Britain was that Buffon was French and Catholic, whereas the Swedish Protestant Linnaeus, in contrast, posed a threat in neither imperial nor confessional terms. Thus, British natural historians rejected Buffon's classification system as French scientific imperialism, and it was during the Seven Years War that Peter Collinson and John Ellis undertook an effort to achieve acceptance of Linnaeus's botanical classification system in Britain, inviting the master's star pupil Daniel Solander for this purpose at the height of the conflict with France in 1760. Apart from the structural differences between the English and German cultures of knowledge, it was confessional proximity and lack of global power that made Scandinavian and German scholars attractive for science in the service of the British Empire. Hanover was linked to Britain through the Personal Union, but also Prussia, Brunswick, Mecklenburg, and the Thuringian states were throughout the period usually either allied with Britain or at least neutral. They were certainly no threat on the global level, and quite as throughout the eighteenth and nineteenth centuries, British Royalty drew its male and female consorts from respected Protestant houses ruling over small-scale territories, these German states similarly served as a reservoir for the expanding world of English scholarship which was evidently unwilling to satisfy its demand

[51] Dougherty 2007 (note 29).

for highly-qualified botanists, mineralogists, and philologists with the help of its great rival France or her allies.

The employment of scholars standing, at least formally, outside the imperial dualism of France and Britain also contributed to the continuation of exploration throughout this period of conflict, and added weight to Banks's claims that scholarship should not be affected by war. When English explorers in the South Sea began to be arrested by the French (Matthew Flinders was arrested on Mauritius in 1803 and kept in prison by the French for seven years), non-British personnel offered the advantage of neutrality. Hornemann had no difficulty travelling through France in 1797, at the exact moment when Napoleon was preparing his Egyptian campaign, and even received the explorer in Paris. When, a few months later, the French caught up with Hornemann in Egypt, Napoleon's authorities actually assisted the German emissary of London's African Association.[52] This, however, threatened to undermine Banks's position in the British public, and his attempts to differentiate between political conflict and scholarly exchange resulted in accusations of "unpatriotic" behaviour. At this point, the inherent tension between a science that understood itself as "useful" and "imperial" on the one hand, and the norms of the European Republic of Letters on the other, could no longer be contained.

Conclusion: Scholarship and Migration

Britain was not only the period's greatest naval power and the centre of its own imperial networks. Britain was the lens through which many continental Europeans came to see the extra-European world in the eighteenth century, and as we can see in the case of the South Sea mania that gripped Germany in the 1770s and 1780s, this also determined what became visible at all, and what did not.[53] Simultaneously, however, it was also Europe which helped England make sense of her own imperial experiences. For the task of incorporating these rich collections, and of making them

[52] Gascoigne 1994 (note 5), 243.

[53] This was considered by George Forster, Helmut Peitsch, '"Noch war die halbe Oberfläche der Erdkugel von tiefer Nacht bedeckt". Georg Forster über die Bedeutung der Reisen der europäischen "Seemächte" für das deutsche "Publikum"', in Hans-Jürgen Lüsebrink (ed.), Das Europa der Aufklärung und die aussereuropäische koloniale Welt (Göttingen 2006), 157–174; John Gascoigne, 'The German Enlightenment and the Pacific', in Larry Wolff and Marco Cipollini (eds.), The Anthropology of the Enlightenment (Stanford 2007), 141–171.

relevant to the European republic of letters, she remained dependent on others. German scholars, in turn, who in this age of European expansion wished to get their hands on first-hand information from places as far as Tahiti, were dependent on the money and logistics of Britain as a world power. When the Napoleonic Wars interrupted communication between the continent and Britain, the exchange of texts, objects, and staff could no longer be maintained. The Anglo-German networks in natural history that had grown with the British Empire for half a century now fell victim to Napoleon's *Empire*, and were not resumed in the decades after 1815 when England set about restructuring the sciences. In the later nineteenth and twentieth centuries, the ensuing build-up of new domestic institutions, such as the University of London, and the reform of old ones, such as the Universities of Oxford and Cambridge and the Royal Society, would take pride of place in the narratives of a History of Science that came to be written along national lines. The dependencies and connections between the British Empire, natural history, and continental scholars were conveniently forgotten. In the genealogy of "British discoveries", Newton, Cook, and Darwin would figure as heroes, whereas gentlemen-collectors, such as Banks, as well as their continental servants, were marginalized.[54] It is perhaps no accident that these immigrant scholars are being rediscovered today, in another age of academic migration.

[54] Andrea Rusnock, 'Correspondence Networks and the Royal Society, 1700–1750', *British Journal for the History of Science* 32 (1999), 155–169: 155.

STARTING-OUT, GETTING-ON AND BECOMING FAMOUS IN THE EIGHTEENTH-CENTURY REPUBLIC OF LETTERS

Laurence Brockliss

Background

The Republic of Letters was the brainchild of Erasmus (c. 1467–1536) and his humanist friends largely north of the Alps in the first half of the sixteenth century. The northern humanists were a small if growing group of intellectuals dotted around the continent who were dedicated to the resurrection of Ciceronian Latin and the recovery through careful textual exegesis of the original versions of classical texts and the Scriptures. Thereby, it was believed, the true moral and spiritual meaning of these texts might be extracted and their readers would be led to a better, more Christ-like life. Dependent on the patronage of sympathetic churchmen and princes, the humanists self-consciously formed themselves into a virtual community of likeminded scholar citizens who wanted to distinguish themselves absolutely from the masters and doctors of Europe's universities who traditionally claimed the monopoly of learning. This community would be held together in part by personal contact—humanist scholars were frequently on the move—but also by correspondence. Church and state had always used letters to issue orders, lay down the law and strengthen the faint-hearted in imitation of St. Paul. The rediscovery of Cicero's letters to his family and friends by the Italian Renaissance humanist, Petrarch (1304–1374), gave the nascent community a new epistolary model to build on whereby a close relationship could be maintained at a distance through the exchange of information and news.[1]

[1] Hans Bots and Françoise Waquet, *La République des Lettres* (Paris 1997). Erasmus intended his own copious correspondence to be a model for the future: he published a *Libellus de conscribendis epistolis* in 1521 and saw a huge collection of his letters through the press: see Chris L. Heesackers, 'Erasmus epistolographus', in Christiane Berkvens-Stevelinck, Hans Bots and Jens Häseler (eds.), *Les grands intermédiares culturels de la république des lettres* (Paris 2005), 29–59. For the development of letter writing in Europe, see Roger Chartier, Alain Boureau and Cécile Dauphin, *Correspondence. Models of Letter-Writing from the Middle Ages to the Nineteenth Century* (Cambridge 1997).

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In the second half of the sixteenth and seventeenth centuries membership of this virtual community expanded dramatically. By 1700 its members were not only classical and Biblical scholars but also lawyers, antiquarians, historians and natural philosophers. The Republic's *raison d'être* had also developed far beyond the original conception of its humanist founders. On the one hand, the Renaissance humanists' critical approach to contemporary versions of classical texts and the Scriptures had been extended to texts and artefacts of all ages. On the other, the natural philosophers and mathematicians within the Republic believed they were well on the way to replacing the text-based qualitative physics of the Ancients with a new science based on observation and measurement.[2] Nonetheless, on the eve of the eighteenth century, the Republic of Letters still retained a close connection with its roots. As was the case for Erasmus, correspondence at a distance between its citizens was the key to its maintenance, a task that had become considerably easier by the end of the seventeenth century with the development of state postal services.[3] Like Erasmus, too, its members believed that learning must have a deeper social purpose: study was not to be pursued for its own sake but to improve mankind morally, and increasingly, materially. In consequence, what distinguished the Republic's citizens in 1700 as it had two centuries earlier was that they held a broadly positive view of human beings and their potential, which put them at odds with the gloomy Augustinian anthropology of both the Protestant and Catholic churches.[4]

The citizens at the turn of the eighteenth century also remained true to the humanists' original belief that they themselves in their personal interaction within the virtual community held a mirror up to the rest of Christendom. Theirs was a virtuous republic which was kept in being by

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[2] For recent studies of the development of the Republic, see Sebastian Neumeister and Conrad Wiedemann (eds.), *Res Publica Litteraria: Die Institutionen der Gelehrsamkeit in der frühen Neuzeit* (Wiesbaden 1987), 2 vols.; Hans Bots and Françoise Wacquet, *Commercium litterarium. La Communication dans la République des letters 1660–1750. Forms of Communication in the Republic of Letters* (Amsterdam 1994); Berkvens-Stevelinck et al. 2005 (note 1) (which has chapters on most of the leading members).

[3] They were still not to be relied on. Wherever possible, citizens of the Republic entrusted letters to merchant intermediaries. Parcels were particularly difficult to get safely to their destination.

[4] Counter-Reformation Catholics were just as austere as Protestants. One might believe in justification by faith and works and one by faith alone. But Catholics believed that human beings could only perform acts that would gain merit in God's eyes through a gift of divine grace. Humans could do nothing on their own. For the Catholics' complicated theology of grace, see Laurence Brockliss, *French Higher Education in the Seventeenth and Eighteenth Centuries: A Cultural History* (Oxford 1987), 247–258.

the understanding that humans had an obligation to serve and help one another irrespective of national, confessional and other differences. The Republic of Letters had no frontiers. A republican in one country would welcome a fellow citizen from another, answer his letters and even lend him books. It was a republic built on an ethic of reciprocity, which drew on both the ideas of classical citizenship and the honour culture of the aristocracy, which equally in theory knew no boundaries. Of course, as this chapter will make clear, the Republic of Letters was never the virtuous community that its citizens imagined. Its members were never completely emancipated from the shackles of state, confession, social position and gender. Nor were they free from the temptations of the Old Adam in consolidating their position within the virtual community. Nonetheless, in both public and private statements—especially in their correspondence—citizens emphasised their allegiance to this ideal and made it the touchstone of membership. They presented themselves as selfless members of a community of scholars and scientists seeking to improve man's understanding of himself, his past and the world around him, so that superstition should be routed, reason triumph and mankind prosper.[5]

The Republic in the Age of Enlightenment

The Republic of Letters in the eighteenth century was just a larger version of its earlier self. In the age of Haller the Republic of Letters was at its zenith. This was still an age of faith. It was certainly a different and novel era in that for the first time a growing number of Europeans broke with their Christian inheritance and no longer accepted that the Bible was the Word of God and Christ the Redeemer. But they were always a minority.[6]

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[5] A good account of the ethics of the community and their frequent transgression is contained in Ann Goldgar, *Impolite Learning: Conduct and Community in the Republic of Letters, 1680–1750* (London 1995). In recent years, even Erasmus has been accused of self-centredness, see Lisa Jardine, *Erasmus, Man of Letters: The Construction of Charisma in Print* (Princeton 1993). For an eighteenth-century critique of the gap between rhetoric and reality, see the chapter by Marian Füssel below.

[6] Throughout this chapter there is no attempt to distinguish the Republic of Letters from the Enlightenment. Those, like Peter Gay, who see the Enlightenment as essentially a Paris based movement dedicated to the marginalisation of the church and the reform of the state and society make a clear distinction between the two: see id., *The Enlightenment: An Interpretation* (London 1970), 2 vols., I: especially 21. For other scholars, such as Daniel Roche, for whom the Enlightenment is a much broader movement embracing all who believe that human beings can be improved morally and materially this distinction

What really distinguished the century from its predecessors was that many educated Christians came to hold a more positive view of human potential and rejected the Augustinian underpinning of traditional Christianity. This development, whatever its cause, inevitably redounded to the benefit of the virtual Republic.[7] Whereas its citizens, especially its natural philosophers, had hitherto been frequently cold-shouldered by suspicious clerics and fundamentalist princes who had seen their thirst for useful knowledge as the devil's work, now more and more members of the elite shared the republicans' vision of moral and material improvement and wanted to contribute to it.[8] It has been suggested that the community still only numbered 1,200 at the turn of the eighteenth century. On the eve of the French Revolution, it contained at the very least 30,000 active citizens, who were to be found living not just in Europe but virtually everywhere in the world where Europeans had colonised or settled.[9] Moreover, the Republic's activities were sustained by hundreds of thousands of peripheral participants who collected samples and artefacts in the field, did the

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is otiose: see, e.g., id., *Les Républicains des letters. Gens de culture et lumières au XVIII^e siècle* (Paris 1988). I belong to the second camp. Eighteenth-century intellectuals who challenged the authority of the church and denied the divinity of Scripture form a sub-set of the Republic but are not *sui generis*. For a recent account of the spread of atheism and deism in Europe from the late seventeenth century, which somewhat controversially takes Spinoza and the Netherlands, as its starting point, see Jonathan Israel, *Radical Enlightenment: Philosophy and the Making of Modernity, 1650–1750* (Oxford 2001).

[7] The development of a more this-worldly Christianity has not been studied to the same degree as the growth of deism and atheism. But for a useful introduction to the way France was dividing into two new religious camps in the eighteenth century—Augustinian and anti-Augustinian—see Robert R. Palmer, *Catholics and Unbelievers in Eighteenth-Century France* (Princeton 1939).

[8] Of course long before 1700 there had always been some princes happy to patronise experimental philosophers. Alchemists, who promised to use their knowledge to build up the wealth of the state, were often welcome at court, though their position was usually precarious: see *inter alia* Pamela H. Smith, *The Business of Alchemy. Science and Culture in the Holy Roman Empire* (Princeton 1994): on the projector Johann Joachim Becker (1635–1682).

[9] Laurence Brockliss, 'La République des lettres et les médecins en France à la veille de la Révolution', *Gesnerus* 61 (2004), 255–283: 255; Charles Withers, *Placing the Enlightenment: Thinking Geographically about the Age of Reason* (London 2007); James Delbourgo and Nicolas Dew (eds.), *Science and Empire in the Atlantic World* (London 2008): both works insist that western Europe in the eighteenth century did not have a monopoly over original scholarship and science but that innovative research was being done world-wide. For the growth of one sub-group within the Republic, the botanists, see the chapter by René Sigrist in this volume.

donkey-work in the laboratory and the garden, and helped get the citizen's ideas into print.[10]

Virtually all of the active members of the Republic had studied at university or received at the very least a good classical education: they were thus predominantly male and almost exclusively belonged to the affluent elite. For the most part the citizens were princes, aristocrats, clergymen, lawyers and doctors (and physicians rather than surgeons).[11] Only in Italy do female members of the Republic seem to have formed a recognisable group.[12] Only in the first British Empire were there to be found in any number active participants who were merchants, such as the London naturalist and antiquarian, Peter Collinson (1694–1768), or even artisans, such as the printer and inventor, Benjamin Franklin (1706–1790).[13] Peripheral participants could come from all sections of the population, on the other hand: even peasants made a contribution to the world of learning by placing antiquities that they discovered in ploughing in the hands of a local collector (for a price) rather than throwing them to one side or smashing them.[14]

There has been a tendency to treat the Republic as egalitarian, a virtual embodiment of the classical republics much beloved and vaunted by Jean-Jacques Rousseau (1712–1778) and his followers. In fact, it was no such thing. It was a virtual state in which the traditional hierarchies did

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[10] Cf. the account of the Zurich botanist, Scheuchzer's, team of outworkers in the chapter by Urs Leu in this volume.

[11] The presence within the Republic of princes and aristocrats in large numbers was a sign of changing times: its citizens were no longer socially marginalised.

[12] The women were treated as marvels whom every tourist to Italy had to visit: see Marta Cavazza, 'Between Modesty and Spectacle: Women and Science in Eighteenth-Century Italy', in Paula Findlen, Wendy Wassyng Roworth and Catherine M. Sama (eds.), *Italy's Eighteenth Century. Gender and Culture in the Age of the Grand Tour* (Stanford 2007). In Italy there were female natural philosophers and mathematicians; elsewhere they were mainly poets and novelists with limited pretension to scholarship or learning. For female citizens of the Republic in France, see Bridgette Byrd O'Connor, *Marie Le Masson Le Golft: Eighteenth-Century Educator, Historian, and Natural Philosopher*, PhD dissertation, University of Oxford, 2005, chapter 1.

[13] For Collinson, see *Oxford Dictionary of National Biography*, sub nomine.

[14] Laurence Brockliss, *Calvet's Web. Enlightenment and the Republic of Letters in Eighteenth-Century France* (Oxford 2002), 213–214. Many outworkers were women, such as the female draughtsman who worked for the naturalist, Réaumur (1683–1757), and inherited his papers on his death. Some outworkers became members of the Republic in their own right. The botanist, André Thouin, used his position as head gardener at the Paris Jardin du roi from 1764 to 1793 to build up an international correspondence: see Emma Spary, *Utopia's Garden. French Natural History from Old Regime to Revolution* (London 2000), chapter 2.

not usually pertain, but it was hierarchical nonetheless: status reflected perceived expertise rather than titles, wealth, or age. In 1748 an Oxford medical practitioner called Humphrey Sibthorp (1712–1797) became director of the Oxford Botanical Garden on the death of the respected botanist, Johann Jakob Dillenius (1687–1747). The latter had been in contact for some time with his Göttingen counterpart, the Swiss physiologist, Albrecht von Haller (1708–1777), swapping seeds and roots for the mutual advantage of their two gardens. Sibthorp wished to continue the trade but he had never met Haller, and Haller was a professor of anatomy and botany of fifteen years standing with a growing reputation as a natural historian thanks to the publication of his *Flora Helvetica* in 1742. Understandably. Sibthorp, although only four years younger than Haller, was nothing if not deferential in his first approach. He assured Haller that the late Dillenius had repeatedly called the Göttingen professor the "prince of botany" and insisted that he alone could bring the *Pinax* of Caspar Bauhin (1560–1624) up to date (a task Dillenius had been appointed to perform but had failed to finish). In his second letter he reiterated the sobriquet and offered his services as a conduit not just for seeds and roots but botanical and medical books too.[15] But there was nothing strange in Sibthorp's sycophancy. The Oxford physician was putting his foot on the first step of a tall ladder whose rungs were very wide at the bottom but very narrow at the top. He was a tyro who was expected to speak to Haller as a son to a father or as a client or courtier to a prince, not as an equal. Every republican occupied a rung on the ladder, if their position seldom stayed exactly the same, and in writing to another citizen, they adjusted their tone according to the perceived status of the recipient. Those at the bottom offered services; those at the top commanded it. Linnaeus (1707–1778), the one naturalist in the mid-eighteenth century with a truly pan-European renown, was particularly "grand". As the merchant, Collinson—a highly respected botanist but not in the top flight—peevishly reminded the Swede in another letter of 1748: "It is a General Complaint that Dr Linnaeus Receives all & Returns nothing."[16]

There has also been a tendency to treat the Republic as homogeneous, or if fractured, primarily divided along confessional, imperial, national or

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[15] Burgerbibliothek Bern, Sibthorp to Haller, 2 April and 23 December 1748.

[16] *"Forget not mee & my garden…". Selected letters, 1725–1768 of Peter Collinson, F.R.S.*, edited and with an introduction by Alan W. Armstrong (Philadelphia 2002), no. 79, 27 March 1748.

embryonic disciplinary lines.[17] This neglects the extent to which viewed from the bottom up there were as many republics as republicans. It is best represented spatially as a bizarre coat of chain mail made from 30,000 single and singular links. Each member of the Republic had his or her own personal link, whose size and durability was determined by the number, permanence and geographical range of his or her circle of intellectual sociability, measured in terms of his or her correspondence.[18] Many, probably most, republicans were only ever small links in the coat of mail, for their closest contacts were with other members of the Republic in their immediate region and their intimate circle was small. The physician, antiquarian and naturalist, Esprit Calvet of Avignon (1728–1810), for instance, was an important celebrity in the Rhône valley but was little esteemed or known outside. He received letters during his lifetime from some 330 fellow citizens, yet he never had more than seventeen close correspondents at any one time, and all but three of these came from the Midi and only one, the Sicilian physician, Joseph Micciari, from outside France.[19] A few republicans, on the other hand, formed large, adamantine links: their lasting and genuine epistolary exchanges were many and cross-national. Voltaire (1694–1778) must evidently be put in this category; so, too, must Haller who included many long-lasting international contacts among his 1,200 correspondents, such as the London physician, John Pringle (1707–1782), author of nearly 160 letters to his Swiss friend between 1760 and 1777.[20]

At the same time, however large or small an individual's correspondence circle, it always interlocked with others ensuring that the coat of mail knitted together. Calvet's close correspondents each had his own circle, but as far as can be known (apart from Calvet, only the correspondence

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[17] There *is* much truth in this. See the chapter in this volume by Thomas Biskup on the close links between citizens in Hanover and England, both governed by the same prince in the eighteenth century; also Caspar Hirschi's essay on the different profiles of England and France.

[18] The metaphor is my own. There have been several attempts in recent years to isolate the chief characteristics of a scientific circle: e.g., Philippe Dujardin, *Du groupe au réseau* (Paris 1988); Daniel Parrocchia, *Philosophie des réseaux* (Paris 1993). For the eighteenth-century correspondence circle, see the recent P.Y. Beaurepaire (ed.), *La Plume et la toile. Pouvoirs et réseaux de correspondence dans l'Europe des lumières* (Paris 2002).

[19] Brockliss 2002 (note 14), chapter 2. Micciari came from Messina. Calvet kept him informed about the latest medical publications.

[20] Theodore Besterman (ed.), *Voltaire's Correspondence* (Geneva 1953–1965), 108 vols. Voltaire had 1,392 correspondents. Otto Sonntag (ed.), *John Pringle's Correspondence with Albrecht von Haller* (Basle 1999).

Fig. 1. Esprit Calvet (1728–1810) was an archetypal unsung member of the Republic of Letters in the eighteenth century. Little known outside his native Provence, he was a physician, naturalist and antiquarian who left his fortune, library and collections to his native city of Avignon to establish a museum. Portrait in oils, attributed to Philippe Sauvan, Musée Calvet (Avignon).

of one of the group has survived in its entirety) they chiefly corresponded with each other. They formed, then, a tight web of Midi antiquarians and naturalists (though not one, it should be said, that embraced all the active participants in these fields in the region).[21] The group, though, did not exist in isolation for through their usually weaker, more brittle contacts with outsiders, they were joined to the greater Republic and touched many other links in the coat of mail. Though Calvet had never met or written to Voltaire and had little time for his religious beliefs, they had eight correspondents in common. Nor, despite being a physician, did he have any direct contact with great Swiss physiologist, Haller, though he had a number of the latter's medical works. Still, Calvet and the citizen of Bern had eleven mutual correspondents in France.[22] Moreover, the coat of mail was never finished, for fresh links were always being added as new citizens joined the Republic, and the individual links expanded or contracted as a republican's star waxed or waned on his becoming more established or on his losing energy, enthusiasm or credit as he grew old. Calvet for one peaked in the Republic on the eve of the Revolution. He survived the holocaust of the 1790s but he was an old man by the time stability returned and several of his close friends lost their livelihood and in one case their life during the Terror. For the last ten years of his life, he was a relatively isolated figure, living in Avignon in the midst of his collection with only two librarians for his close correspondents, the abbé de Saint-Véran (1733–1812), an antiquarian based a few miles away in Carpentras, and his former medical pupil, Claude-François Achard (1751–1809), further afield in Marseille.[23]

Becoming a Member

The Republic of Letters was thus a complex, competitive and plastic entity, a far cry from the scholarly arcadia outside time that its representatives frequently idealised it as. Like all labyrinths entry was deceptively easy. All that was needed to make a start was a good knowledge of Latin

[21] Brockliss 2002 (note 14), especially 87–88 and 95.

[22] Ibid., 391. According to Calvet's library catalogue, he possessed a 1752 French translation of Haller's *Elements of Physiology* and an eleven volume *Artis medicae principes* (Lausanne 1769): Bibliothèque Municipale Avignon MS 2346, nos. 263 and 302.

[23] Brockliss 2002 (note 14), chapter 8. Saint-Véran looked after the Bibliothèque Inguimbertine set up in 1768, while Achard was custodian of the library set up from books confiscated during the Revolution.

(Greek was less necessary), a surplus income (though not a large fortune), a passion for one of more branches of the sciences or humane letters, and a few relevant books. Discovering what moved individuals to join the Republic is not easy, given the gaps in the biographies of even the most famous. But it would appear that many republicans first developed an enthusiasm for "knowledge creation" and learnt the tricks of the trade while at school or university. The educational institutions of eighteenth-century Europe are not renowned for their contribution to the advance of science and learning. But it must be remembered that throughout the eighteenth century many universities and not a few schools that taught philosophy harboured at least one professor who was an established member of the Republic and who was ready to pass his enthusiasm on to the young, and most medical faculties boasted an anatomist or botanist whose intellectual horizons extended beyond the immediate demands of the classroom.[24] Moreover, after the foundation of the University of Göttingen in the 1730s, in the German universities at least, professors were expected to involve themselves in some form of research.[25] Even humble Königsberg sheltered an Immanuel Kant (1724–1804), though he appears not to have taught his critical philosophy in the classroom. Calvet's interest in antiquities and natural history almost certainly was fired while he was a boarding pupil at the Jesuits' college at Lyon. The college had a well-equipped natural-history cabinet and offered extracurricular lessons in experimental philosophy. Calvet's mathematics professor was one Laurent Béraud (1702–1777), who published papers on both Gallo-Roman history and the physics of electricity.[26]

Others, for whom school and university were a disappointment, gained inspiration and the requisite knowledge from local republicans who took them under their wing. This was particularly true of female citizens for whom there was seldom chance of institutional education. The Bolognese,

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[24] In Catholic countries, where secondary education was dominated by the regular orders, it was commonplace for philosophy to be taught at school after the Latin and Greek humanities course. The universities in these states tended to be reduced to the three higher faculties of theology, law and medicine.

[25] Charles E. McClelland, *State, Society and University in Germany, 1700–1914* (Cambridge 1980), chapters 2 and 3. For an early attempt to evaluate the German universities' contribution to research in this period, see R. Steven Turner, 'University Reformers and Professorial Scholarship in German 1760–1806', in Lawrence Stone (ed.), *The University and Society* (Princeton 1974), 2 vols., II: chapter 10.

[26] Notably, *Dissertation sur le rapport qui se trouve entre la cause des effets de l'aiman et celles des phénomènes de l'electricité* (Bordeaux 1748). For his influence on Calvet, see Brockliss 2002 (note 14), 195.

Laura Bassi (1711–1778), one of the handful of women experimental physicists in the period, whose erudition was the wonder of Europe in the mid-eighteenth century, was not brought up to be a female prodigy, for her lawyer father did nothing to promote her intellectual interests. She was only able to enter the Republic thanks to the lessons she received in secrecy from Gaetano Tacconi, professor at the local university and the family's physician, and her subsequent marriage to the experimental philosopher, Guiseppe Veratti.[27] Other fathers were more discerning. The naturalist, local historian and educationalist, Marie Masson-Le Golft (1749–1826), whose membership of the Republic of Letters has only recently been uncovered, came from Le Havre and was the daughter of a merchant. About the age of fifteen, her father entrusted his talented daughter's education to a family friend, the abbé Dicquemare (1733–1789), who taught experimental physics in the town and was himself a budding natural historian. From being his pupil, Masson Le Golft became his assistant, his amanuensis and close, though Platonic, friend, and was herself enabled to enter the Republic in her own right.[28] Aristocratic women, on the other hand, who desired to join the Republic, could command the educational services of the learned. The Marquise de Châtelet (1706–1749), as is well known, gained her ability to manipulate Newton's mathematical physics better than her more famous lover thanks to the private tuition she was given by Maupertuis (1698–1759).[29]

Most tyro members of the Republic, it must be suspected, did not take a conscious decision to seek admission, all the more that for many the intellectual activities that led to their membership were a hobby, something they did (usually in the evenings) once they had ceased curing souls, administering justice or caring for the sick.[30] The famous epiphany of the historian, Edward Gibbon (1737–1794), on 15 October 1764 while sitting amidst the ruins of the Roman forum, smacks of hindsight. So, too, the many obituaries of French experimental philosophers which suggest that science was a vocation, pursued by the young acolyte to the despair of family and friends, should be seen as a rhetoric, an idealisation of a

[27] Paola Bertucci, *Viaggio nel paese delle meraviglie. Scienza e curiosità nell'Italia del Settecento* (Torino 2007), 208–210.

[28] Byrd O'Connor 2005 (note 12), especially 40–45.

[29] Mary Terrall, 'Emilie du Châtelet and the Gendering of Science', *History of Science* 33 (1995), 283–310.

[30] Many noblemen first became interested in forming a collection or pursuing a branch of learning once they had retired from the army or navy in middle age.

conventional biography.[31] Starting-out seldom required hard choices. Some novices initially must have been virtually self-contained citizens, solitary links in the chain, displaying an independence of which Rousseau would have been proud. The abbé Constantin (d. 1797) was a humble curé at Aurel, a village in the Sault valley to the east of Mont Ventoux. Somehow or other he put together a small coin collection in a part of Dauphiné which was far from the main centres of Roman Gaul and a much more plausible site to pursue natural history. His existence seems to have been completely unknown to antiquarians in the south-east of France until one day early in 1781 he made contact with Calvet of Avignon through a friend who was a canon in local Cavaillon. Calvet graciously agreed to be his correspondent, and there began a frequent and learned exchange of letters that would last for nearly twenty years until Constantin's death.[32] Just as geographically isolated was another Dauphinois curé, Dominique Chaix (1730–1799), who from 1758 was based at Baux (or Les Baux) in the Basses Alpes, a village with 150 inhabitants. Chaix was a botanist of peasant stock who seems to have gained his interest in plants from the local Carthusians at Durbon. For forty years, he assiduously served his small flock, while devoting his leisure and three-quarters of his small garden of 800 square meters to rearing local flora. Each year he would plant, grow, dig up, then dry 40 to 60 new or unusual varieties.[33] Chaix seems to have had next to no visitors, and he owed his limited connections with the outside world to a fellow botanist of equally lowly origins from the neighbouring village of Le Noyer, Dominique Villars (1745–1814). Chaix and Villars apparently teamed up in 1765 and kept in regular correspondence from 1772, two years after Villars moved to the bright lights of Grenoble where he trained to be a surgeon. Patronised by the local intendant, Villars became an important figure in the town's medical establishment and in the last years of his life (1805) would eventually become a professor in the medical faculty at Strasbourg.[34] Thanks to Villars, Chaix was put in touch with

[31] Charles B. Paul, *Science and Immortality. The Eloges of the Paris Academy of Sciences (1699–1791)* (London 1980). For the Paris and other eighteenth-century academies, see below.

[32] Bibliothèque Municipale Avignon MS 2350, fol. 7–8: Constantin to Calvet, 24 January 1781. Constantin's last dated letter to the Avignonais was written on 22 January 1797, a few months before he died: ibid., MS 2351, fol. 251.

[33] Roger L. Williams, *The Letters of Dominique Chaix, Botanist-Curé* (London 1997), introduction.

[34] Ibid. The collection contains 170 letters.

botanists in Montpellier and Paris and had the loan of books that he could otherwise not afford, such as Haller's study of alpine plants.[35]

Becoming Known

The majority of citizens of the Republic of Letters, however, who had the necessary cultural and material capital, were not content to rest on the bottom rung of the social ladder. They wanted to climb as high as they could and enjoy the marks of a widespread positive endorsement of the value of their studies: that is to say, a geographically broad array of correspondents, prestigious intellectual visitors, and membership in some form of the growing number of academies set up to promote science and letters. In the eighteenth century, the academy was the institutional embodiment of the Republic of Letters. In 1700 only a handful existed apart from the London Royal Society and the Paris Académie des Sciences. On the eve of the Revolution, they numbered at least a hundred: virtually every European state could boast at least one and they were beginning to be founded in the Americas. For most part devoted to both the sciences and humane letters, the academies provided an institutional focus for citizens of the Republic resident in the large cities and pulled their less fortunate brothers and sisters into their orbit through the offer of associate or corresponding membership. Not every citizen felt the need to become a member but their importance can be measured by the fact that an individual's status in the Republic could be quickly determined by the number of academies to which he was affiliated.[36]

Mounting the ladder, though, took time and some citizens were far better placed to succeed than others. It helped in the first place to live and work in a large, preferably capital city, where there would be an existing

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[35] Ibid., letters 17–22 passim: Chaix to Villars, 2 September 1776—12 September 1777. Villars left 4,000 books, Chaix 50 and a herbarium of 3,000 plants. Chaix was so poor at one stage he had to sell his watch to buy books and brown paper (to mount his plants?): ibid., no. 10: 26 February 1774.

[36] James E., McClellan III, *Science Reorganised: Scientific Societies in the Eighteenth Century* (New York 1985). Specialist societies were usually in the capital cities. The most famous was the Paris Académie des Sciences: see Roger Hahn, *The Anatomy of a Scientific Institution: The Paris Academy of Sciences, 1666–1803* (London 1971). France had nearly 40 provincial academies in 1789 with 2,500 members, see Daniel Roche, *Le Siècle des lumières: Académies et académiciens provinciaux, 1680–1789* (Paris 1978), 2 vols., I: especially chapter 4. For membership of one German academy, see the chapter by Marion Mücke in this volume.

and expanding scientific community, increasingly institutionalised around a learned society. In a city a tyro republican would never be isolated and would have no difficulty attaching himself to an established citizen who could help him up the lower rungs and introduce him to outside correspondents. Only those at the very top or the socially prominent could ape Voltaire and hide themselves in the countryside. Ambitious young republicans realised this only too well. It explains why Villars decided on a career change in his late twenties. He seems to have had no formal education and had originally been a notary's clerk, then a minor bureaucrat in his tiny home town: a medical practitioner with an enthusiasm for botany in Grenoble had many more opportunities of getting on. The city had no official academy until 1789 but a private society existed from the early 1770s, which was patronised by a number of local medical and legal luminaries, such as the Voltarian, Henri Gagnon (b. 1728), the much-loved grandfather of Stendhal (1783–1842), who had a large library and his own botanical garden.[37]

Villars, it must be said, was lucky. He was able to take advantage of a local government initiative aimed at increasing the number of learned surgeons in small town Dauphiné and was granted a three-year scholarship by the *intendant* to study at Grenoble's newly-established surgical school. Once there he wormed his way into the *intendant*'s affection.[38] Many other small-town republicans could not abandon their profession so easily, and very few, even Villars, were able to relocate to one of the handful of really dynamic cultural centres, such as Paris or London. Only one of Calvet's correspondents, the vulcanist, Barthélemy Faujas de Saint-Fond (1741–1819), managed to settle permanently in the French capital, and then not until he was in his forties. Having trained as a lawyer and practised for some years in Grenoble. Faujas at twenty-four eventually settled in his home town of Montélimar, where he was president of the local court. Nine years later, however, in 1774 he made a very enjoyable visit to Paris and somehow persuaded the French government to enlist his help in writing a natural history of Dauphiné. As soon as the first volume was printed in 1781, he decamped for good to the capital, where through the patronage

[37] Roche 1978 (note 36), I: 55 and 58–59.

[38] Williams 1997 (note 33), no. 6: 24 May 1773. Schools for the study of surgery were founded in many French cities in the eighteenth century as part of a move to improve the training of surgeons: see Laurence Brockliss and Colin Jones, *The Medical World of Early Modern France* (Oxford 1997), especially 506 (map). The Grenoble school was attached to the local Hôpital de la Charité run by a male nursing order which had its own botanical garden.

of the naturalist, Buffon (1707–1788), he became part of the establishment of the Jardin du roi (later the Muséum d'histoire naturelle).[39]

For the large majority of citizen hopefuls the best chance of gaining entrée to the world of the Republic's elite was to have travelled when young. Those who had been on some form of grand tour in their late teens and early twenties had usually had some contact with significant figures in the Republic, even if at that date they had no conscious ambition of becoming one of the learned themselves. This is one of the reasons why medical practitioners in particular were well placed to mount the ladder. Few of them came from backgrounds that allowed them to embark on the classic Italian grand tour when young.[40] But it was established practice in the eighteenth century that medical students after starting their studies in a local university would visit one or more of Europe's leading centres of medical training to gain hands-on training in dissection, surgical operations and patient care. Paris above all was the medical Mecca that drew students from all over the continent because of the wealth of its facilities. Haller's medical cursus, after leaving Tübingen and travelling to Leyden to listen to the great Hermann Boerhaave (1668–1738), was only peculiar in that he went on from the French capital to London, at that date not considered to be medically important.[41] While in Paris medical students inevitably tasted its many delights. Calvet graduated from Avignon in 1749 and spent the next year in Montpellier, the most important medical centre in the Midi, where he met the up-and-coming nosologist, François Boissier de Sauvages (1706–1767). He then spent eighteen months in Paris from the autumn of 1750 to the summer of 1752. Besides listening to medical lectures given at the Collège royal by Jean Astruc (1684–1766) and taking private courses with the popular physician anatomist, Antoine Petit (1718–1794), he developed his literary interests, improved his Greek,

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[39] Louis de Freycinet, *Essai sur la vie, les opinions et les ouvrages de Barthélemy Faujas de St-Fond* (Valence 1820), 3–5; Brockliss 2002 (note 14), 109, 116 and 270; Spary 2000 (note 14), chapter 4.

[40] Jeremy Black, *The British Abroad: The Grand Tour in the Eighteenth Century* (Stroud 1992).

[41] Toby Gelfand, *Professionalising Modern Medicine. Paris Surgeons and Medical Science and Institutions in the 18th Century* (London 1980). The fullest account of a young physician's stay in Paris was penned by the Swiss Johann Gessner (1709–1790): see *Johannes Gessners Pariser Tagebuch 1727*, ed. by Urs Boschung (Bern 1985). For the medical grand tour more generally, see Laurence Brockliss, 'Medical Education and Centres of Excellence in Eighteenth-Century Europe: Towards an Identification', in Ole Peter Grell, Andrew Cunningham and Jon Arrizabalaga (eds.), *Centres of Excellence. In Search of the Best Medical Education in Europe, 1500–1789* (Farnham 2010), 17–46.

and visited Parisian collectors, dealers and scientists, presumably armed with letters of introduction. He returned to his native city, set up his plate and never travelled further than Marseille again. But he had acquired a store of useful cultural contacts, including the abbé Jean-Jacques Barthélemy (1716–1795), later keeper of the royal coin cabinet, and the ageing naturalist, Réaumur.[42]

So important was some sort of grand tour for advancement in the Republic of Letters that those who had not managed to travel when young took the opportunity to do so later in life. Goethe (1749–1832) purportedly visited Italy just to escape the boredom and demands of the Weimar court, but the abbé Jean-Antoine Nollet (1700–1770), one of the century's leading experimental philosophers, went there in 1749 to increase his already numerous contacts. Nollet by the late 1740s was a highly regarded electrical philosopher (if later to be worsted by Franklin). As someone who had originally trained to be a priest, however, he had had no chance to travel when young, so welcomed the suggestion that he should go to Italy on an expenses-paid trip as a government spy to investigate the peninsula's silk manufacturing industry. While doing the bidding of the government in secret, he spent eight months improving his image in the Republic of Letters by getting to know the leading scientists south of the Alps and demonstrating his superiority as a an experimental scientist. As a result of his voyage, he had collected a number of new international correspondents, including the coveted scalp of the talented Laura Bassi.[43] Not surprisingly younger men who had not travelled leapt at the opportunity to do so. The only citizen in the Midi to whom the mature Calvet deferred was the naturalist and antiquarian, Jean-François Séguier (1703–1784) of Nîmes, who in 1759 became famous as the man who had cracked the inscription on the pediment of the Maison Carrée. Séguier, though wealthy, had trained as a lawyer at nearby Montpellier and never seen the world. When the

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[42] Brockliss 2002 (note 14), 26–27. Letters of introduction were easy to obtain. When asked, established members of the Republic were expected to provide their juniors with a brief character reference which would gain them admittance to a prominent citizen in another city. Their true views of the tyro were sometimes conveyed in a separate communication: cf. British Library Additional MSS 4056, fol. 72–78: the Paris physician and academician, Etienne-François Geoffroy (1672–1741), to the London physician and collector, Hans Sloane (1660–1753): 12 and 18 April 1739 (private letter and letter of recommendation for a merchant). The Collège royal was an independent institution set up by Francis I in the 1530s to provide lectures in the higher sciences.

[43] Bertucci 2007 (note 27), passim. On Nollet and Franklin, see especially I. Bernhard Cohen, *Franklin and Newton. An Inquiry into Speculative Newtonian Experimental Science and Franklin's Work in Electricity as an Example thereof* (Cambridge 1956).

Italian *érudit* the Marchese Francesco-Scipione di Maffei (1675–1755), on a belated grand tour of his own, visited Nîmes in 1732 to see its antiquities, he agreed to take on Séguier, now nearly thirty, as his secretary. In the marquis's company, the Nîmois visited Paris, then moved on to England and the United Provinces. He accompanied Maffei back to Verona and lived in his villa until he died, thereby becoming integrated into the Italian's own large correspondence circle.[44]

Reciprocity and Dependency

However, it was one thing to make widely flung contacts, another to be able to use them. The leaders of the Republic did not patronise their juniors without good cause. Social climbers in the Republic needed to have something to trade: information, books, seeds, coins, artefacts, even instruments. If there is good reason for seeing the Republic as modern and bourgeois in essence despite its commitment to an ethic which drew on classical and aristocratic discourse, it lies in the fact that its wheels were oiled by the exchange of commodities. Those who had nothing to give might attempt to initiate a correspondence with a republican star but would at best receive a polite and non-committal reply. Part of the art of getting-on therefore was to have something to trade and know exactly who would be most likely to covet it. A young republican with a precious cultural resource could find a prominent "buyer" regardless of any earlier meeting. Humble Chaix was of interest to the botanists of Montpellier and Paris because he had the seeds and roots of precious alpine plants. Calvet was well-placed because the Rhône valley was a treasure trove of Roman antiquities that Parisian antiquarians sought to add to their collections. In his case, too, he had a stroke of luck early in his career as a citizen. One of his first permanent correspondents was an elderly priest called Gérouin, who was prior of the abbey of Forques on the opposite bank of the Rhône to Arles. Gérouin in the 1750s was acting as a collector of interesting antiquities for the Parisian connoisseur, Anne-Claude-Philippe de Thubières, comte de Caylus (1692–1765), who was in the process of publishing his

[44] Séguier left a short account of his Grand Tour: see Bibliothèque Municipale Nîmes MS 286. For his life and work, see Gabriel Audisio and François Pugnière (eds.) *Jean-François Séguier. Un Nîmois dans l'Europe des Lumières*, transactions of a colloquy held at Nîmes in 2003 (Aix-en-Provence 2005). Séguier's activities in Paris and London are also known through the letters he wrote to his friend and fellow botanist, the physician, Pierre Baux (d. 1786): see Bibliothèque Municipale Nîmes MS 416, letters 1–48.

Recueil d'antiquités égyptiennes, étrusques, grecques et romaines, which was supposed to thereafter establish the canons of good taste. When the abbé died in 1760, Calvet seized the opportunity to offer to fill his shoes, although he appears never to have met the count in Paris. Thereby he obtained as his patron a wealthy aristocrat and leading light in both the capital's Académie des Inscriptions and Académie de Peinture.[45]

Woe betide a Republican tyro, though, who had not done his homework. In November 1767, Calvet, now thanks to Caylus, a man to cultivate in the Midi, received a letter from a physician of Aix-en-Provence called Tournatoris, expressing a desire to swap the results of their respective researches in anatomy and chemistry. This was followed a few months later by the gift of a preparation of a spleen as a pledge of their future fruitful cooperation. Admittedly, Calvet had professed anatomy at the University of Avignon in 1753–1754, but he had only an academic interest in the subject. Tournatoris's brief courtship of Calvet, therefore, came to an abrupt end: there were no more letters; he was presumably repulsed, if he received a reply at all, and had lost rather than gained from the approach by irritating an important local regional player.[46]

Nor was it necessarily plain sailing once the attention of a leading citizen of the Republic had been captured. Patrons were ruthless and could drop an aspirant citizen when it appeared that they had outlived their usefulness. Sibthorp's approach to Haller proved successful and for some years they exchanged seeds. But after nine years, in the spring of 1757, the correspondence came to an abrupt end.[47] By then, Haller was no longer in Göttingen and presumably had no need of the Oxford garden's seeds which seem to have seldom germinated. An Oxford correspondent, too, was hardly ideally placed to search out books published in England, especially one who seems to have had a narrow range of close acquaintances, so had limited news to proffer. Haller had a potentially much more useful English correspondent in the London merchant Collinson with whom he was equally exchanging letters, seeds and news from 1748 until the

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[45] Brockliss 2002 (note 14), 72–73. Caylus's *Recueil* appeared in 7 vols. between 1752 and 1767. For an account of his mission to revivify French decorative art using the best classical models, see Marc Fumaroli, 'La République des Lettres VI: Un gentilhomme universel: Anne-Claude de Thubières, comte de Caylus (1694–1765)', *Annuaire du Collège de France* 93 (1992–1993), 563–581.

[46] Bibliothèque Municipale Avignon MS 2353, fol. 346–349: Tournatoris to Calvet, 11 November 1767 and 23 February 1768.

[47] Sibthorp's last letter was dated 1 March 1757. From 1754 he had only written one letter a year.

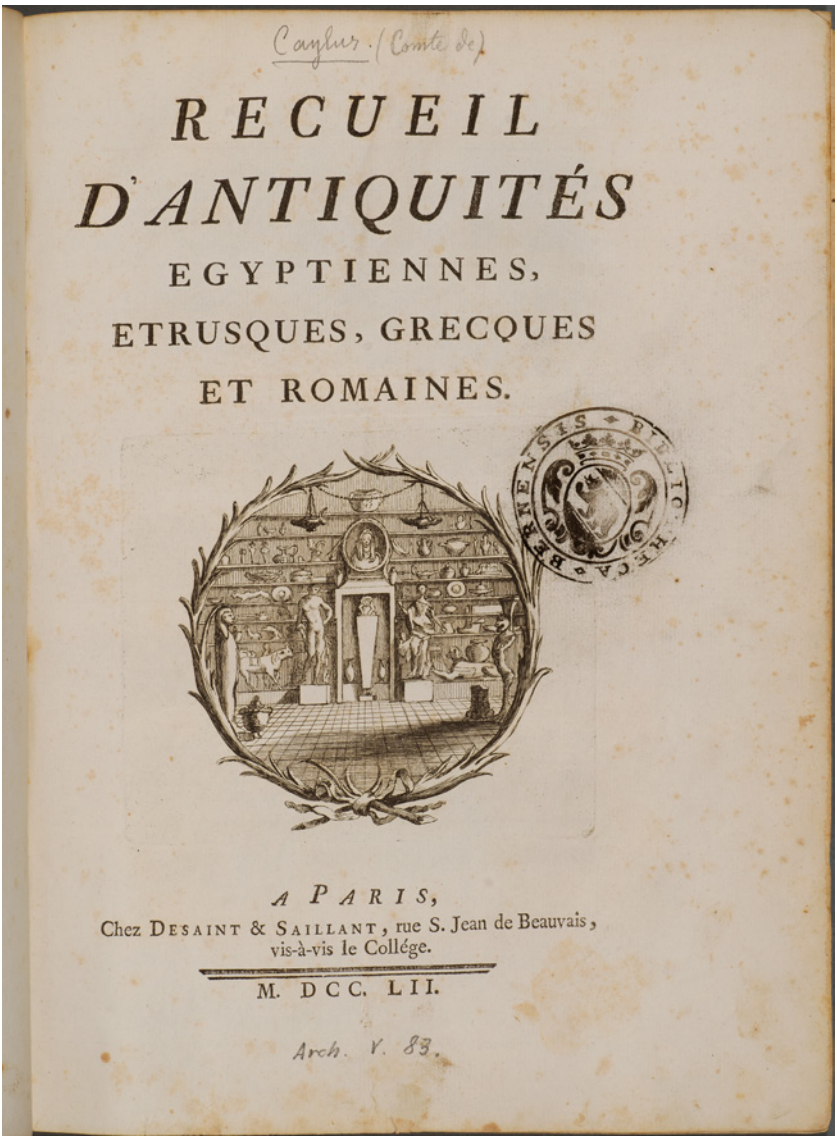

Fig. 2. Caylus (1692–1765) was one of the leading figures in Parisian polite society in the mid-eighteenth century. Grand aristocrat, author of many *contes*, member of both the Académie des inscriptions and the Académie de peinture, and patron of many provincial érudit, he spent the last part of his life in search of the most interesting and exquisite Gallo-Roman artefacts which might be used to improve contemporary French design.—Frontispiece from his *Recueil d'antiquités égyptiennes, étrusques, grecques et romaines* (7 vols; Paris, 1752–67). Bern University Library.

latter's death twenty years later.[48] Moreover, from the end of 1760, if not before, he had found a peach in the queen's physician, Sir John Pringle, who might not have been a source of seeds but had his finger on the pulse of London's cultural life. Thus, when the naval expedition led by James Cook (1728–1779) to observe the transit of Venus in the Pacific returned in the summer of 1771, Haller must have been among the first, if not the first, continental republican, to have a detailed account of the voyage thanks to Pringle's friendship with the civilian naturalists on board, Joseph Banks (1743–1820) and the Swede, Daniel Solander (1736–1782).[49]

High profile correspondents, even if constant, could also end up reducing the young republican to a state of dependency. Tyro citizens could easily become serfs rather than freemen providing a service. This seems to have been particularly the case in the American colonies where the small number of active republicans before the War of Independence were largely isolated and relied heavily on the mother country for books, information and access to the giants of the continent.[50] Collinson's utility to the likes of Haller was that he was the primary conduit whereby seeds from the American colonies reached Europe. And he governed his intellectual empire despotically. His American clients were told what roots and seeds were required and were expected to use the London merchant when they wanted to get into print. Only a few Americans, notably Franklin, ever gained a modicum of independence, and even Franklin was far more in thrall to the British connection than he cared to remember at the end of his life.[51]

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[48] See Urs Boschung et al. (eds.), *Repertorium zu Albrecht von Hallers Korrespondenz 1724–1777* (Basel 2002), 2 vols., I: 98. Collinson also did not think much of Sibthorp: see his letter to Linnaeus, 26 October 1747, in Armstrong 2002 (note 16), 78.

[49] Sonntag 1999 (note 20), 167ff. Pringle announced the safe return of the *Endeavour* in a letter of 23 July 1771 only a few days after its arrival. In this and subsequent letters he passed on to Haller the substance of his private conversations with Solander and Banks about their discoveries. For more on the transit of Venus, see the chapter by László Kontler in this volume.

[50] The best introduction is Nicholas M. Wrightson, *Franklin's Networks: Aspects of British Atlantic Print Culture, Science and Communication, c. 1730–60*, PhD dissertation, University of Oxford, 2007. This successfully demolishes the argument put forward by some recent American historians of science that the British American colonies had developed a separate national scientific tradition before 1776: e.g., Susan Scott Parrish, *American Curiosity: Cultures of Natural History in the Colonial British Atlantic World* (Chapel Hill 2006), chapters 5–7.

[51] In his autobiography, written after independence and his embassy to the French court, Franklin gave a highly coloured account of his earlier role in the Republic of Letters.

One way to escape the dangers of personal dependency was to seek institutional approbation. The second half of the eighteenth century offered a new way for the young to gain recognition beyond their immediate native hearth in the form of the growing number of annual prize-essay competitions. Sponsored in particular by the learned academies and societies, they offered the chance of glory without dependency.[52] It can be no coincidence that Rousseau, so anxious to remain detached from all links of obligation, should first have become an international name through the two essays he presented to the newly-formed Dijon academy for the competitions of 1750 and 1753.[53] Relative old stagers, such as Calvet (he was established by the time the genre really took off post-1760), were not enticed to compete. But citizens of a slightly younger generation entered the fray with gusto. One such was the Montpellier physician, Pierre-Joseph Amoreux (1741–1824), whose interests lay in botany and agronomy, the former inherited from his father, Guillaume, who had practised medicine at Beaucaire. After a conventional medical training—three years at Montpellier, then a spell in Paris—Amoreux returned to the Midi in 1762, where he stayed for the next forty years. Although based in a city where he both practised medicine and looked after the recently founded library of the medical faculty, he had the good fortune to own a small estate outside Montpellier where he pursued his enthusiasm for natural history. Amoreux was a prize-essay competition "groupie". For the next thirty years he churned out papers at the rate of more than one a year on a wide range of topics—enclosures, silk-worm farms, olive cultivation and so on. His reward was membership of Montpellier's scientific academy and honorary membership of numerous others.[54] Like Calvet, Amoreux's

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[52] The fullest account of essay questions set by an academy is Janice Spurlock, *Essays in Reform on the Eve of the Revolution: The Academy of Chalons-sur-Marne, 1776–1789*, PhD dissertation, University of London, 1993. On one occasion a nun sent in an essay. Some essay questions were set by journals (for these, see below). Indeed, the best remembered essay question in the eighteenth century 'Was ist Aufklärung?' was set in 1783 by the *Berlinische Monatsschrift*, not an academy.

[53] Rousseau claimed that his decision to enter the first contest was the result of reading by chance the issue of the *Mercure de France* where the Academy had advertised its competition for 1750 on the question: "Has the progress of the sciences and the arts done more to corrupt morals or improve them?": see Rousseau, *The Confessions* (English trans., Harmondsworth 1954), 327–328. The *Mercure* was a weekly literary journal that carried Parisian news. Kant also first came to public notice when he responded to the Berlin academy's essay competition of 1763.

[54] For an account of Amoreux's life and intellectual activity, see Bibliothèque Municipale Avignon MS 1269, *Mémoires de ma vie*. He won the prize on several occasions. E.g., in 1784, for his answer to a question set by the Paris Société royale de médecine on "les abus

fame scarcely travelled beyond the Midi. He had only one known foreign correspondent—a brief liaison with Jean-Jacques Dapples of Lausanne (c. 1701–1774) in 1760–1762.[55] But unlike Calvet, there is no evidence he was ever anyone's client, even if the correspondence that he maintained with Séguier of Nîmes from 1772 to 1784 reveals that he could sometimes be the junior partner in a relationship.[56]

Getting into Print

Entering a prize-essay competition had the added bonus that the winning entry would be probably published at the expense of the academy, thereby potentially making the young citizen name known to the whole Republic. A relatively isolated intellectual could be thereby raised from obscurity over night, as the Hellenist, Guillaume-Emmanuel-Joseph Guihem de Clermont-Lodève, Baron de Sainte-Croix (1746–1808), who lived in his château in the village of Mormoiron near Carpentras, discovered in 1772. In that year, just twenty-six, he was crowned by the Paris Académie des inscriptions for his account of the historiography of Alexander the Great. When his lengthy essay (it had taken five years to complete) was published three years later, like its subject, it took the world by storm.[57] In fact, getting into print was almost certainly the best way to cause a splash for any aspiring republican. The problem was that it could be very expensive. Most publishing houses would not take on the cost of printing learned monographs, especially if their subject matter was too novel, demanded close reading, was couched in mathematics, or simply unfashionable. Commercial publishers liked works of history or books that would titillate, such as accounts of monstrous births. More demanding and dryer texts were only attractive if they had captured, albeit temporarily, the attention of the *beau-monde* and would turn a quick profit. Botany was always fashionable and became more so as the century progressed; in the mid-eighteenth century the fad was electricity; later on it was gas

à reformer dans l'éducation physique des enfants" (ibid., 65). He entered contests as far away as Denmark.

[55] Bibliothèque Nationale Ms français nouvelles acquisitions 6570, fol. 42–51.

[56] Ibid., MS 6571, fol. 112–240: letters from Séguier to Amoreux.

[57] Brockliss 2002 (note 14), 313–314 and 331. Later in life Sainte-Croix made important contributions to the comparative study of ancient religions. Sainte-Croix had had a brief military career before turning to historical study. It is unclear how he became a more than competent Greek scholar.

chemistry. As the radical wing of the Republic of Letters was well aware even subversive works, which in most states had to be published anonymously abroad and smuggled in to escape censorship, did not usually sell well unless they were packaged as entertainment.[58]

The new academies and societies that were often backed by government money were able to ensure that some serious works of learning and science got into print. At the end of the seventeenth century the Royal Society saw the *Principia* (1687) of Newton (1642–1727) through the press with help from a subsidy given by Edmund Halley (1656–1742). In 1775 the publication of *Travels in Asia Minor and Greece* by Richard Chandler (1730–1810) was overseen by the London Society of Dilettantis which had financed his expedition to the Ottoman Empire to collect Greek inscriptions.[59] But even scientific institutions could baulk at the cost of publishing learned works. The Académie des inscriptions paid for the publication of Sainte-Croix's *Alexander* but made the Baron pay for the cost of reproducing his maps himself. In consequence, many authors were forced to fall back on their own resources entirely. Publishing a book or paper on one's own account, however, was not to be undertaken lightly if one was a professional man with limited means, a family to support and a dowry to find: many dedicated republicans got their fingers burned. Sibthorp suspected that Dillenius's publication of his *Hortus Elthamiensis* (1732) and his *Historia Muscorum* (1742) lost him £200, a not inconsiderable sum.[60] A large number of citizens then paid to have their name put on the cover of a book only once or twice in their lives, generally when they were starting out and wanted to offer evidence of their scholarship to patron and friends. And they kept it short. Calvet's one and only publication was a brief account of a Gallo-Roman guild of water boatmen who plied their

[58] Hence the best-selling works from the pens of the French *philosophes* were usually short, witty and verging on the pornographic and presented as anecdotes, memoirs or histories. See the list of top underground sellers in Robert Darnton, *The Forbidden Best Sellers of Pre-Revolutionary France* (London 1996), 63–65. Publishers who took a risk on a "dry" work of learning could learn the hard way: David Hume (1711–1776) was a great success as a historian; his masterpiece, the *Treatise on Human Nature* (1738–1739) was a complete flop.

[59] For Chandler and his contribution to epigraphy, see *Oxford Dictionary of Biography*, sub nomine.

[60] About £16,000 in today's money: Burgerbibliothek Bern, Sibthorp to Haller, 1 March 1757. Even affluent citizens could find the cost of financing their own publications daunting: the great eighteenth-century English antiquarian, Richard Gough (1735–1809), resorted to credit to publish his first work, *Anecdotes of British Topography* in 1768: *Oxford Dictionary of National Biography*, sub nomine.

trade on the Durance. It appeared in 1766, when he was just beginning to attract notice, sadly too late for Caylus to receive a copy.[61]

In the second half of the eighteenth century, however, there were many more opportunities for going into print without breaking the bank. The English developed the art of subscription publication which allowed unpromising works such as the voluminous history of famous English ladies by the autodidact, George Ballard (1706–1755), to see the light of day. Prominent individuals were needed to get the list started, so patronage still played a part in the process, but they were not required to risk a large sum of capital.[62] More importantly, all over Europe new possibilities were opened up with the explosion in the number of learned and not-so-learned periodicals, many totally unconnected with the existing academies and some by the end of the century even devoted to specialist sciences.[63] The abbé Dicquemare for one benefited greatly from the new medium. Living in a port town with no academy and little intellectual life, not even a *collège de plein exercice* (that is, a secondary school that taught mathematics and philosophy), he understandably jumped at the chance to write for the eclectic Paris-based periodical, launched by Jean-Baptiste-François Rozier (1734–1793) in 1771: the *Observations sur la physique, sur l'histoire naturelle et sur les arts*. Between 1772 and his death in 1789, Dicquemare published seventy-five articles in Rozier's journal, the majority on marine invertebrates.[64] His pupil, Marie Masson-Le Golft, who would have helped him prepare many of these articles, followed his lead on her own account, at least initially. Between 1779 and 1785 she published five journal articles, three in the *Observations* and two in the *Travaux*

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[61] *Dissertation sur un monument singulier des utriculaires de Cavaillon, où l'on éclaircit un point important de la navigation des anciens* (Avignon 1766).

[62] *Memoirs of Several Ladies of Great Britain Who Have Been Celebrated for Their Writings or Skill in the Learned Languages, Arts and Sciences* (Oxford 1752). Ballard was one of the most bizarre members of the English Republic of Letters. He had little formal schooling but became an expert in the Anglo-Saxon language and compiled an important collection of manuscripts which he left to the Bodleian library. For a complete list of books published by subscription in Britain, see Francis J.G. Robinson and Peter J. Wallis, *Book Subscriptions Lists. A Revised Guide* (Newcastle 1975). Publication by subscription never took off in France, although the original folio edition of the *Encyclopédie* was published this way.

[63] E.g., the *Annales de chimie*, launched in France in 1789 to disseminate the new chemistry of Lavoisier (1743–1794).

[64] Byrd O'Connor 2005 (note 12), 41–43. He did write a few books and invented a celestial planisphere. He may have known Rozier through Nollet whose course he had followed as a young man. For Rozier and the *Observations*, see Charles Coulston Gillispie, *Science and Polity in France at the End of the Old Regime* (Princeton 1980), 188–190. For learned journals generally, see the chapter by Jeanne Peiffer in this volume.

de l'Académie de Rouen, a society of which Dicquemare was an associate member. An ambitious woman who managed to break into a male world by eventually becoming an honorary member of the Arras academy in 1787, Le Golft was a demanding contributor. She seems to have dropped Rozier when he failed to live up to her expectations. First, he did not find a publisher for her book-length history of Le Havre, as she had hoped, and then she took exception to the way he had produced her second article on the physical changes that occurred to milk when it boiled.[65]

The new journals introduced another figure of authority into the Republic of Letters, the editor, who had the power to make or break young citizens. But the journals did offer the impoverished tyro a real chance to reach an audience without having recourse to traditional channels of patronage and beg at the gate of the rich. Only the very marginalised needed a patron to negotiate with the editor on their behalf. It was Collinson inevitably who decided that an American botanist's endeavours were good enough for the Royal Society's *Transactions* and undertook, if an article was found wanting, to place it in another organ. Unpromising material was hawked round Europe. In the late 1740s, the classification of Virginian flora by Cadwallader Colden (1688–1776) was eventually published in the *Acta* of the Upsalla Academy, while botanical papers by another Virginian, John Mitchell (d. 1768), ended up in the Nuremberg journal of Christoph Jakob Trew (1695–1769). One suspects that neither was particularly happy with the outcome.[66]

Becoming Famous

For the most part, it was clearly far easier in the second half of the eighteenth century to become established as an independent member of the Republic of Letters than ever before. That said, publishing in periodicals, albeit regularly, would be unlikely to bring a citizen lasting fame. Short pieces, often no more than a page or two, could put a citizen in the public eye but was unlikely to demonstrate that a new star had appeared in the scientific firmament. Haller's 1752 article on irritability in the commentaries of the Göttingen Royal Society must have been one of the few to cause a real splash in the Republic of Letters in the eighteenth century, but the author was already well-known, it was long, appeared in an official

[65] Byrd O'Connor 2005 (note 12), 42, 49–50 and 267.
[66] Armstrong 2002 (note 16), especially letters 61 and 65.

publication and was quickly translated.[67] The dominant currency of academic respectability before the French Revolution remained the book, as Le Golft's keeness to get her lengthy history into print attests. And books, as we have seen, were not easy to place in the public domain unless the author was wealthy or backed by a wealthy patron or institution. The second half of the eighteenth century saw the emergence of a more modern publishing environment, but *pace* Habermas, it was no bourgeois public sphere. Patronage was still frequently the key that unlocked the door to fame. A few had both the means and the intelligence to construct their own success in the Republic. Joseph Banks, who would be President of the Royal Society from 1778 to 1820, had an inherited rent-roll of £5,000 a year: hence his ability to join a naval expedition as a civilian; Voltaire an income of 75,000 *livres* because he had been part of a syndicate that fixed a government lottery in the 1720s.[68] But the large majority of citizens were not in that comfortable position and few lived from their pen, even in London's Grub Street. The relatively impecunious lexicographer and essayist, Samuel Johnson (1709–1784) took a great risk when he famously spurned the grudging patronage of Lord Chesterfield in 1747 while compiling his dictionary.[69] The result was that many republicans left their life's work in manuscript in the hope that someone might publish it after their death. Dicquemare entrusted 900 pages to the care of Le Golft; Calvet in the 1790s carefully copied out twice all the six volumes of papers that he bequeathed, leaving one copy to Avignon, the other to Marseille (where he had been an associate member of the academy). In neither case was their oeuvre ever put in print.[70]

Even the wealthy, well-positioned and talented did not always rise to the top of the ladder. Science and scholarship in the eighteenth century were frequently at the mercy of nature and the elements: libraries and laboratories went up in flames; manuscripts were lost in transit. The Chevalier Jaucourt (1704–1780) is remembered today as the man who wrote as much as half of the later volumes of the *Encyclopédie*. But he turned

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[67] For its dissemination, see Hubert Steinke, *Irritating Experiments. Haller's Concept and the European Controversy on Irritability and Sensibility, 1750–90* (Amsterdam 2005).

[68] Sonntag 1999 (note 20), 238; Theodore Besterman, *Voltaire* (London 1969), 160–161. Pringle still felt that Banks would not be able to publish the drawings that he made on the voyage with Cook without royal assistance.

[69] *The Yale edition of the works of Samuel Johnson* (1958ff.), 13 vols., I: 262 (from Boswell's *Life*). The standard account of Grub Street is Pat Roger, *Grub Street. Studies in a Sub-Culture* (London 1972).

[70] Byrd O'Connor 2005 (note 12), 43; Brockliss 2002 (note 14), 17 and 332–334.

his hand to hack work because his medical *magnum opus* had been lost at sea. Other bright stars shone brightly, then fizzled out. The botanical ambitions of Joseph de Jussieu (1704–1779) were ultimately scotched by his own physical decay. Of the three Jussieu brothers who dominated French botany in the age of Buffon, Joseph was best placed to succeed. Idealistic, rich and a member of the Paris Académie des Sciences, he was allowed to wander fairly freely around Spanish Latin America for three and a half decades from the early 1730s. However, his wanderings bore no fruit: papers and samples he sent back to France were lost en route, his health suffered and he lost the will and energy to make the best of his opportunities. On his death, Condorcet (1743–1794), secretary to the Paris Academy, tried his best to extol Jussieu's achievements in his eulogy but to no avail.[71]

It also remained the case that throughout the eighteenth century many citizens gained positions of respectability in the Republic of Letters who had done little or nothing to merit the status. Provincial academies and societies were full of individuals who had been coopted because they were local grandees. Their contribution to scholarship was minimal.[72] Admittedly, academicians in capital cities, where entry was normally closely policed by the central government, usually merited their elevation, even if patronage always played a role in success. To this extent the Republic of Letters was a meritocracy. But where a state's leading academies and societies were in effect gentlemen's clubs, dependent on members' subscriptions, then the intellectual quality of the membership could be just as low as any provincial society's. The Royal Society was a case in point. After the death of Newton in 1727 it lapsed into a state of semi-somnolence that even Banks's long stint as president did little to allay.[73] The young

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[71] Frank A. Kafker, *The Encyclopedists as a Group: A Collective Biography of the Authors of the Encyclopédie* (Oxford 1996), 118; Neil Safier, 'Fruitless Botany: Joseph de Jussieu's South American Odyssey', in Delbourgo and Dew 2008 (note 9), chapter 8.

[72] On the eve of the Revolution there was talk of Calvet becoming one of the 30 resident academicians of Marseille, a rare honour in that he lived in Avignon. He was to replace one Louis-François de George d'Ollière, abbé de Luminy, about whom nothing is known save that he purportedly wrote a panegyric on Louis XV. He had been an academician since 1764! See Brockliss 2002 (note 14), 31.

[73] Banks was quite happy to induct as fellows prominent figures in the public eye who claimed to be interested in the natural world but gave no obvious evidence of the fact. One such, for instance, was the surgeon who had looked after the dying Nelson at Trafalgar, William Beatty (1773–1842), who became an FRS in 1818: see Laurence Brockliss, John Cardwell and Michael Moss, *Nelson's Surgeon. William Beatty, Naval Medicine and the Battle of Trafalgar* (Oxford 2005), 173–174.

and talented but poor were therefore having to strive for success not simply within an ever expanding field—the Republic was getting larger and larger—but with outsiders who by dint of their social position expected to be given a place of honour in any Ancien Régime institution.

Not surprisingly, in such a competitive environment where the odds were stacked against success, many tyro citizens were tempted to make extravagant claims for their research in order to get themselves in the public eye. This probably explains the extraordinary lengths to which the physician and future revolutionary journalist, Jean-Paul Marat (1743–1793), went to in pushing the merits of his theories of electricity, fire and light in the 1770s and 1780s. Having wormed his way into favour at court, he looked to storm the Académie des Sciences. Thinking big and aiming high, he declared in the papers that he presented to the academy that his research had shown up the limitations in the dominant Newtonian paradigm.[74] Other citizens must have been tempted to play fast and loose with the ethics governing the Republic in order to improve or sustain their position with minimum effort. Linnaeus, we saw, was accused of ignoring the obligations of reciprocity. But he was a paragon of virtue compared with the naturalist, Emanuel Mendes da Costa (1717–1791), clerk to the Royal Society, who promised foreign correspondents the earth in exchange for artefacts and did nothing.[75] Success too was so difficult to obtain that old friends became jealous and were not above spreading rumours that fame had been achieved at the cost of virtue. Faujas de Saint-Fond's circle never forgave him for deserting Montélimar and making good in Paris. At best he was accused of failing to correspond and getting ideas above his station in ordering a fancy bookplate; at worst he was judged guilty of mistreating wife in his search for success.[76]

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[74] The academy gave him a fair hearing but understandably dismissed his claims. Marat came from Prussian-controlled Neuchâtel and was part of a large lower middle-class family. He came to believe that the academy was a despot and scientific achievement should be evaluated by the lay public: Robert Darnton, *Mesmerism and the End of the Enlightenment in France* (Cambridge 1968), 93–94 and 164–165; Gillispie 1980 (note 64), 303–318.

[75] George Rousseau and David Haycock, 'The Jew of Crane Court: Emanuel Mendes da Costa (1717–1791), Natural History and Natural Excess', *History of Science* 38 (2000), 127–170; Brockliss 2002 (note 14), 256. Da Costa misappropriated membership fees and ended up in prison. Another transgressive was the naturalist John Hill (1714–1775) who saw the Republic as an opportunity to make money and devoted his life to encyclopaedic publishing ventures which were short on scholarship.

[76] Brockliss 2002 (note 14), 108, 117 and 312. There is no evidence that Faujas did reach the top by nefarious means.

The Advent of Professionalisation

It would be wrong in consequence to feel that the Republic of Letters was beginning to break down on the eve of the French Revolution. As was pointed out at the beginning of this chapter, the Republic had never functioned perfectly. There again, the sense of alarm that the antics of a Marat or a Mendes da Costa evoked among contemporaries would suggest that there was considerable fear in the second half of the eighteenth century that the Republic might implode. This makes sense. The canons of knowledge gathering were becoming ever more rigorous as the century progressed, especially in the sciences that were fast splitting up into discrete branches.[77] The Republic's members on the other hand were largely amateurs and generalists: most had day jobs, and most, if they had specific intellectual interests, made an effort to keep abreast of developments in all the learned arts and sciences.[78] The exponential expansion of the Republic, moreover, had inevitably created an extremely disparate community: even among committed members, there was a great distance between the dabbler and the "research active".

It was inevitable then that in the maelstrom of the French Revolution the world of the Republic of Letters would be turned upside down as much as Ancien Régime Europe *tout court*, all the more that its institutional embodiment, the academies and societies, were initially seen by the revolutionaries as elitist "aristocratic" bodies that had to be purged from the body politic.[79] By the early nineteenth century, the new intellectual stars were much more carefully distinguished from the interested amateurs. On the continent of Europe, virtually every significant researcher was now a salaried state official who held a post in higher education. In return for spending some of his day teaching his specialism in a university or specialist school, he was provided with the space and facilities to pursue his intellectual interests, be it within the university or school itself or in

[77] See especially Christian Licoppe, *La Formation de la pratique scientifique. Le discours de l'expérience en France et en Angleterre (1630–1720)* (Paris 1996).

[78] As is clear from the contents of their libraries: e.g., Brockliss 2002 (note 14), chapter 6; id., 'Medicine, Enlightenment and Christianity in Eighteenth-Century France', in Ole Peter Grell and Andrew Cunningham (eds.), *Medicine and Religion in Enlightenment Europe* (Aldershot 2007), chapter 6.

[79] The French shut all the Ancien Régime academies in 1793. For the attack on the Paris Académie des sciences in particular, see Hahn 1971 (note 36), chapters 6–9.

a research institute or hospital.[80] In the course of thirty years scholarship and science had been professionalised. Only in England, where the impact of the French Revolution was felt far less, did the traditional Republic of Letters survive into the second half of the nineteenth century. And it was England that gave birth to the last great gentleman amateur scientist, Charles Darwin (1809–1882). We remember his *Origin of Species* (1859) as the first blast on the trumpet of modernity. In fact, with its publication, the Erasmian Republic of Letters took its final, superlative bow.[81]

[80] It makes sense in this context to see both the creation of the French *grandes écoles*, the Paris *école/faculté de médecine* and the *Institut* and the creation of the Humboldtian university as part of the same movement, even if sociologists of science, notably Joseph Ben-David in his classic 'The Rise and Decline of France as a Scientific Centre', *Minerva* 8 (1970), 160–179, have seen them as different stages in the professionalization of science. It has been recently suggested that in many respects the professionalization of knowledge creation was a sham and that criteria for success under the new dispensation were just as subjective as before: see William Clark, *Academic Charisma and the Origins of the Research University* (London 2006).

[81] Amateur intellectuals continued to flourish in continental Europe in the nineteenth century in the many provincial societies and they did important work especially in the fields of archaeology, local history and folklore. But they were looked down upon by professional researchers. For the amateur tradition in France, see Robert Fox, *The Culture of Science in France, 1700–1900* (Aldershot 1992), especially chapters II and III.

FROM ARISTOCRATIC SUPPORT TO ACADEMIC OFFICE: PATRONAGE AND UNIVERSITY IN THE SCOTTISH ENLIGHTENMENT

Iris Fleßenkämper

Although international research on the Scottish Enlightenment today still readily draws on methods and questions from the early history of biography and ideas, recent scientific approaches have proven themselves by merging these perspectives and enhancing them from a social-historical point of view. Consistent with a new "social history of knowledge",[1] most research on the specific historical conditions of the production and dissemination of enlightened knowledge focuses on the literary and publishing culture of eighteenth-century Scotland.[2] However, the role that social networks played in the rise and legitimation of knowledge and the sciences has only recently begun to be studied extensively.[3] The present article aims to elucidate the transition in forms of scholarly patronage that finally led to the establishment of professional autonomy in eighteenth-century Scotland.

Enlightenment historians still tend to assume that the social backbone of this movement included members of a "free intelligentsia" (Karl Mannheim) who were "beholden to none but themselves, the public who bought their writings or subscribed to their lectures, and such cultural middlemen as publishers."[4] However, authors such as David Hume, who received a substantial income from his publications, most notably for his *History of England*,[5] and who was able to live on his writings even in the longer term, remained an exception. The majority of eighteenth-century Scottish scholars were still dependent on the support of mostly aristocratic patrons to finance their research. Compared with previous

[1] Peter Burke, *A Social History of Knowledge. From Gutenberg to Diderot* (Cambridge 2000).

[2] Richard Sher, *The Enlightenment and the Book. Scottish Authors and Their Publishers in Eighteenth-Century Britain, Ireland, and America* (Chicago 2007); Stephen Brown and Warren McDougall (eds.), *The Edinburgh History of the Book in Scotland, Volume 2: Enlightenment and Expansion 1707–1800* (Edinburgh 2011).

[3] See Sher 2007 (note 2), 203ff. and Roger L. Emerson, *Academic Patronage in the Scottish Enlightenment. Glasgow, Edinburgh and St Andrews Universities* (Edinburgh 2008).

[4] Roy Porter, *The Enlightenment. Britain and the Creation of the Modern World* (London 2000), 479.

[5] David Hume, *History of England* (London 1754–1762), 6 vols.

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centuries, however, academic patronage in the Age of Enlightenment changed its traditional form: While in most cases a single patron still paid for the personal support of a scholar and his projects at the beginning of the eighteenth century, patrons increasingly lobbied for official positions for their scholars in the course of the century. Thus, with the patronage of office behind them, scholars were supported first and foremost in their professional career, which in the long run offered them the necessary financial and social independence to act as researchers and authors.

This article deals with the question of the extent to which patronage helped Scottish Enlightenment scholars to position themselves institutionally in order to consolidate as an intellectual elite and thus to contribute to the implementation and dissemination of innovative knowledge. On the basis of several prominent examples, it will investigate the function and etiquette of patronage as an institution that promoted university careers. A further aim is to examine the significance of patronage in the promotion and legitimation of innovative knowledge.[6]

The Scottish Patronage System in the Eighteenth Century

Numerous studies on patronage within hereditary monarchies, republics and principalities of the early modern period have proven that patronage never existed "as a pan-European single institution",[7] but that it appeared in various forms depending on the political culture, social structure and temporal context. Within Scotland the mechanism of patronage in the eighteenth century was also subject to specific domestic rules which were themselves political consequences of the Anglo-Scottish Union in 1707. The Scottish were excluded from participating in governmental policies, at least formally, after the new Westminster parliament had abolished both the *Privy Council* and the ministry of the *Scottish Secretary of State* in 1708–1709.[8] After the union, Scotland no longer had a recognised minister

[6] See also Iris Fleßenkämper, *Considerations, Encouragements, Improvements. Die Select Society in Edinburgh 1754–1764. Soziale Zusammensetzung und kommunikative Praxis einer schottischen Gelehrtengesellschaft zur Zeit der Aufklärung* (Berlin 2010), 171–231.

[7] Birgit Emich et al., 'Stand und Perspektiven der Patronageforschung. Zugleich eine Antwort auf Heiko Droste', *Zeitschrift für Historische Forschung* 32 (2005), 233–265: 258.

[8] Major studies on the political structure of Scotland after the union are: Alexander Murdoch, *The People Above. Politics and Administration in Mid-Eighteenth-Century Scotland* (Edinburgh 1980); John Stuart Shaw, *The Management of Scottish Society, 1707–1764. Power, Nobles, Lawyers, Edinburgh Agents and English Influences* (Edinburgh 1983); id., *The Political History of Eighteenth-Century Scotland* (London 1999); John M. Simpson, 'Who Steered

who could effectively represent the interests of the country. For most of the eighteenth century, the Scottish administrative apparatus thus remained under the influence of English ministers, the first and foremost of these being the Duke of Newcastle.

Although Scotland had no institutionalised interest group, a few Scottish peers succeeded in exerting considerable influence on Scottish office distribution through patronage and placement activities around the middle of the century. Initially, Archibald Campbell, 3rd Duke of Argyll (1682–1761) significantly determined the political course of his country together with his delegate, Andrew Fletcher, Lord Milton (1692–1766). Argyll was able to establish a broad network of dependants due to his social standing, his territorial property and wealth, and not least to numerous family relationships with members of the nobility all over Scotland. He was thereby able to manipulate for his own benefit not only the Scottish constituency and the allocation of parliamentary seats but also the domestic allocation of offices. Argyll was far more successful in such political manipulations than the Duke of Newcastle, who tried to undermine the dominance of Argyll as *Secretary of State for the Northern Department* through his own network of dependants. Yet in the end he had disproportionately less influence in Scotland than the local magnate Argyll.

The political constellation in Scotland changed when George III ascended the throne in 1760 and Archibald Campbell died the following year. At that time, Argyll's nephew, John Stuart, 3rd Earl of Bute (1713–1792), entered the scene as a political intermediary between Scotland and England. Being the King's former tutor and confidant, Bute was appointed *First Lord of the Treasury* in 1762, which corresponded to the office of Prime Minister at the time. Thus, Lord Bute was the first Scotsman after the union to hold an English ministry and was allowed to play an active role in the domestic and foreign affairs of Great Britain.

Bute, as a high-ranking statesman and confidant of the King, commanded the allocation of nearly all resources. Between 1761 and 1765, almost all sinecures and a major portion of the vacancies in both the Scottish courts as well as the financial administration were granted to people who owed their promotion or appointment primarily to Bute

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the Gravy Train, 1707–1766?', in Nicholas T. Phillipson and Rosalind Mitchison (eds.), *Scotland in the Age of Improvement. Essays in Scottish History in the Eighteenth Century* (Edinburgh 1970), 47–72. For the late eighteenth century, cf. Michael Fry, *The Dundas Despotism* (Edinburgh 1992).

and his brokers.[9] His sphere of influence was not restricted to the state's administrative apparatus: Like his predecessor Argyll, Bute also gave particular attention to the Scottish university system. Although it officially fell to the town council to decide on the composition of the staff at the University of Edinburgh, it was, in effect, Bute who regulated recruitment during his mandate as minister of state. Hence, some of the most prominent scholars and university professors in the Enlightenment owed their positions and their success to the commitment of their patron, Bute.[10]

Although Bute held as much political significance as his uncle for a few years, he was not able to exercise his influence in Scotland in the long term as Argyll had been able to. Bute was highly unpopular among the English people due to his position as the King's favourite minister and his Scottish heritage. In spring 1763, he was finally forced to resign from his office as *High Lord of the Treasury* as a result of foreign-policy differences. Despite his short term in office, Bute, like his predecessor Archibald Campbell, contributed significantly to the territorial integration of Scotland into the new Kingdom of Great Britain. Contemporaries such as Argyll and Bute served as intermediaries for the monarch and the government and delegated their power through several dependants in Scotland. In this manner, they succeeded in bridging both spatial and hierarchical distances as well as connecting the local elite in Scotland to central political power in London. Measured against Great Britain's equilibrium policy in the eighteenth century, Scottish patronage research occasionally advances the position that the political rise and career of the Duke of Argyll was a matter of a downright "prodigy".[11] His position of power, however, only revealed that the London government was not able to cope by itself with the administration of the territorial integration of Scotland after the union. Instead, it depended to a great extent on the intermediatory activities of Scottish nobles who had a recognised position of local power and a large clientele alliance. Both Argyll and Bute could thus act convincingly as intermediaries between the centre and the periphery and

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[9] Murdoch 1980 (note 8), 104–123.

[10] Emerson 2008 (note 3); id., 'Lord Bute and the Scottish Universities 1760–1792', in Karl W. Schweizer (ed.), *Lord Bute. Essays in Re-interpretation* (Leicester 1988), 147–179. Concerning the influence of Argyll and Lord Bute on the staffing of the medical chairs in Glasgow and Edinburgh, cf. Roger L. Emerson, 'Medical Men, Politicians and the Medical Schools at Glasgow and Edinburgh 1685–1803', in Andrew Doig et al. (eds.), *William Cullen and the Eighteenth Century Medical World* (Edinburgh 1993), 202–203.

[11] Simpson 1970 (note 8), quotation 65; cf. Shaw 1999 (note 8), 26.

take over important functions in the integration and state-building process of Great Britain.[12]

In the first instance, therefore, the professional and social rise of an ambitious professionist in Scotland depended on direct or indirect contact with Scottish delegates who in turn were in contact with the Scottish nobility at court. Through a direct or indirect relationship with an influential patron, young and qualified scholars who aspired to an academic university career could not only secure the necessary financial resources for their research projects but could also gain a higher status, a new social identity and, above all, academic credibility. In return, the patron received mostly intellectual and solidarity-related gifts that underscored his power as patron and provided him with the recognition of his rank. Hence, early modern patronage can be understood as a system of service and return service as well as a medium not only of financial promotion but also of academic and social legitimation.[13]

Nobility, Brokerage and Patronage: The Rise of William Cullen

Patronage did not consist of a fixed constellation of people that exclusively represented a direct "face to face" exchange between patron and client; rather, patronage was mediated through a broker.[14] It was the main function of the broker to facilitate contact between a low-ranking client and a higher-ranking patron without compromising the reputation

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[12] On the interrelation of patronage and state formation or territorial integration, cf. Emich 2005 (note 7), 244–250; Heiko Droste, 'Patronage in der Frühen Neuzeit—Institution und Kulturform', *Zeitschrift für Historische Forschung* 30 (2003), 555–590: 587f.; Ronald G. Asch, *Der Hof Karls I. von England. Politik, Provinz und Patronage 1625–1640* (Köln et al. 1993), 294; Antoni Mączak, *Klientelsysteme im Europa der Frühen Neuzeit* (München 1988), 352.

[13] Cf. Mario Biagioli, *Galilei, Courtier: The Practice of Science in the Culture of Absolutism* (Chicago 1993); Droste 2003 (note 12), 574.

[14] Sharon Kettering, *Patrons, Brokers, and Clients in Seventeenth-Century France* (Oxford 1986); Jeremy Boissevain, *Friends of Friends. Networks, Manipulators and Coalitions* (Oxford 1974), 147–169; Anne Goldgar, *Impolite Learning. Conduct and Community in the Republic of Letters, 1680–1750* (New Haven 1995), 30–34. Cf. also Andreas Pečar, who introduces the term "Maklerpatronage (broker patronage)" for the function of the intermediary in Andreas Pečar, *Die Ökonomie der Ehre. Der höfische Adel am Kaiserhof Karls VI. (1711–1714)* (Darmstadt 2003), 102. The terms "broker" and "brokerage", which originated in Anglo-American patronage research, have increasingly been taken over in German research since the late 1970s. Cf. Hans-Heinrich Nolte, 'Patronage und Klientel: das Konzept in der Forschung', in id. (ed.), *Patronage und Klientel: Ergebnisse einer polnisch-deutschen Konferenz* (Köln and Wien 1989), 1–17: 5.

of the latter. In retrospect, however, it is not always easy to distinguish patron and broker, as the broker not only acted as a social intermediary but often even possessed himself the necessary financial resources that a petitioner hoped to obtain.

The Scottish lawyer Henry Home of Kames (1696–1782), for example, was a noble landlord, renowned lawyer and contact person for the political elite in London and, therefore, simultaneously a patron and broker. Initially, Kames had worked as a lawyer before he was appointed as a judge of the Scottish Court of Justice in 1752 and acquired the title of Lord Kames. During his career, Kames wrote numerous scripts on moral and natural philosophy and, accordingly, showed particular interest in the cultural advancement of his country. After his promotion to the rank of judge, Kames had the necessary financial and social resources to adequately promote and sponsor the country's talented young academics.[15] Alexander Fraser Tytler, a close friend of the Home family, wrote in a biography of Lord Kames:

> The situation which Lord Kames now filled, while it extended his opportunities of promoting every species of improvement, gave the greater weight and efficacy to his patronage; and his example and encouragement were more particularly beneficial in exciting a literary spirit, which now began to prevail among his countrymen and which was destined to shine forth in his own times with no common lustre. It was but a just tribute to his merit, when many years afterwards, Adam Smith, then in the height of his literary reputation, said, in reference to a remark on the great number of eminent writers which Scotland had of late years produced, 'We must every one of us acknowledge Kames for our master.'[16]

Kames was a "cultural manager" of the Scottish Enlightenment. Moreover, as a member of economic planning boards in Scotland and of the landed gentry, Kames considered it of central importance to promote the agricultural and industrial production of his country and, therefore, also to support natural scientific research projects in particular.

One of his most successful clients in the scientific field was the chemist William Cullen (1710–1790). Cullen was renowned in the eighteenth century above all for his theories on the latent heat of vaporisation as well as for his research on innovative bleaching methods and natural fertilisers. Since the beginning of their acquaintance in 1748, Cullen and Kames

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[15] Ian Simpson Ross, *Lord Kames and the Scotland of His Day* (Oxford 1972), 113–151.

[16] Alexander Fraser Tytler, *Memoirs of the Life and Writings of the Honourable Henry Home of Kames* (Edinburgh 1807), vol. 1, 159f.

Fig. 1. Henry Home, Lord Kames (1696–1782). Portrait by David Martin, National Galleries of Scotland (Edinburgh).

Fig. 2. William Cullen (1710–1790), chemist and physician. Portrait by William Cochran (ca. 1768), National Galleries of Scotland (Edinburgh).

often exchanged views on questions dealing specifically with agriculture and practical chemistry.[17] Kames supported Cullen's research specifically by providing the required financial means and devices to conduct various experiments. Although Kames commissioned the research projects, Cullen could decide freely on the management and organisation of the projects.[18]

In 1749, Kames introduced his protégé to Archibald Campbell, Duke of Argyll, which proved to be extremely beneficial for Cullen's academic career. After Cullen had undertaken several mineralogical chemical analyses by order of Argyll, Argyll successfully championed Cullen's application for the chair of medicine at the University of Glasgow.[19] Meanwhile, Kames did not remain idle: He sent Cullen's agricultural treatises to interested landowners, supported his reception into the renowned Philosophical Society of Edinburgh, and introduced Cullen to Lord Milton, who in turn allowed Cullen to conduct further chemical experiments at his manor in Saltoun.[20]

In 1755, Cullen had the opportunity to continue his academic career at the famous medical faculty in Edinburgh. Andrew Plummer, professor of chemistry and medicine at the University of Edinburgh, was seriously ill and could no longer pursue his teaching activities. Kames then suggested Cullen as the successor of Plummer to George Drummond, Lord Provost of Edinburgh, and praised his academic qualities in a letter to Milton. The town council, however, did not even have the chance to decide, as the Duke of Argyll was already determined to champion Cullen's career again and to lace his appointment. When Cullen later thanked Provost Drummond for appointing him to the post of professor, the latter replied:

> [It is] very obliging in you to mention the part I took in bringing you into the university of Edinburgh . . . But indeed Sir I cannot claim any merite in it.

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[17] John Thomson, *An Account of the Life, Lectures, and Writings of William Cullen* (London 1832), vol. 1, 591–602. See also William Cullen to Henry Home, c. 1752–1753, Glasgow University Library (hereafter GUL), MS Cullen 430/3; William Cullen to Henry Home, n. d., GUL, MS Cullen 430/4; Henry Home to William Cullen, Kames, 30 May 1757, GUL, MS Cullen 26.

[18] Cf. William Cullen to Henry Home, Glasgow 1749, in Thomson 1832 (note 17), 596f.; Henry Home to William Cullen, Edinburgh, 5 January 1750, in Thomson 1832 (note 17), 592f.; William Cullen to Henry Home, Glasgow, 17 January 1750, ibid., 593ff.

[19] Thomson 1832 (note 17), S. 70f.

[20] William Cullen to Henry Home, Glasgow, February 1753, in Thomson 1832 (note 17), 76f.; Henry Home [to William Cullen], Edinburgh, 3 March 1753, National Library of Scotland (hereafter NLS), MS. 10782, fol. 58; Henry Home [to William Cullen], Kames, 25 March 1753, NLS, MS: 10782, fol. 61.

> I had the opinion of The Man on Earth [meaning the Duke of Argyll] to whose Judgment, in matters of that kind, I pay the greatest deference, That you was [!] The man in the island who was the best qualified to fill the vacant professor's chair; and I thought my self happy to have any share in bringing you to it.[21]

It is clear from this letter that the town council had only very limited influence—if any—on the filling of the chair. This finding disagrees with the thesis, that it had primarily been the town council that restricted "this (indolence), job chaffering and sinecure administration"[22] which, in turn, constrained the development of the Scottish universities. In the case of the appointment of Cullen, the town council had just as little input in the matter as had the senate of the University of Edinburgh, which had formerly at least been consulted on applicant selection by the council.

Cullen's relationships with influential noble patrons such as Kames and Argyll turned out to be beneficial in several respects. Being a respectable lawyer and landowner, Kames not only provided for the social network and the financial independence of the aspiring scholar but also enhanced the social recognition of Cullen's research at the same time. Cullen himself characterised his acquaintance with Kames "as one of the most fortunate accidents of his life".[23] Kames, too, could take advantage of the relationship with his protégé in several ways. With Cullen, he had found a skilled assistant who could help him with the composition of his own scientific writings. He was only able to finish his book *The Gentleman Farmer*[24] (1776), which was designed to familiarise landowners with new and fruitful agricultural technological methods, with the help of the accurate know-how of his protégé Cullen.[25] As a client, Cullen was in turn obliged to report on his research work regularly and to send Kames the outcome of his experiments in the form of scientific treatises. If he did not meet the expectations of his patron, the latter could demand better discipline. Statements such as, "I insist upon one paper or another; and I insist

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[21] George Drummond to William Cullen, London, 3 February 1756, GUL, MS Cullen 20.

[22] Michael Maurer, 'Die Universitäten Englands, Irlands und Schottlands im 18. Jahrhundert. Intellektuelle, soziale und politische Zusammenhänge', in Notker Hammerstein (ed.), *Universitäten und Aufklärung* (Göttingen 1995), 243–272: 265.

[23] William Cullen to Henry Home, Glasgow, February 1753, in Thomson 1832 (note 17), 78.

[24] Henry Home of Kames, *The Gentleman Farmer; Being an Attempt to Improve Agriculture, by Subjecting It to the Test of Rational Principles* (Edinburgh 1776).

[25] Steven Shapin, 'The Audience for Science in Eighteenth Century Edinburgh', *History of Science* 12 (1974), 95–121: 103; William C. Lehmann, *Henry Home, Lord Kames, and the Scottish Enlightenment: A Study in National Character and in the History of Ideas* (The Hague 1971), 287.

upon it as a point of right"[26] or, "If I do not get this summer some of your experiments about husbandry, I will abandon you altogether as an utter bankrupt",[27] were not infrequently used by Kames to reinforce his position. Kames saw his position as broker particularly threatened when Cullen also neglected his duties to higher-ranking noblemen to whom he had recommended Cullen.[28] Both the social position of Kames and the status of William Cullen were dependent on Cullen's commitment in equal measure. Therefore, it may be assumed that the dynamics of service exchange which formed the basis of patronage ultimately advanced the scientific dedication of the scholar and, thus, also of overall scientific progress.

Teachers and Students: Joseph Black's Early Promotion

As had been the case for Kames, several opportunities also arose for Cullen to help ambitious scholars achieve success after his own career advancement. As a university professor, he already had it *ex officio* in his power to promote gifted students and to support their research projects. One of his protégés was Joseph Black (1728–1799), who was to go down in history as the discoverer of carbon dioxide and the founder of scientific calorimetry. In the first years of his teaching activities, Cullen employed Black as his assistant and encouraged him to start an academic career. He had Black participate in his teaching and analysed Black's own experiments in his lectures, thus making him publicly known as a skilled young scientist at an early stage of his career.

For his academic career, however, it was at first necessary for Black—as it had been for Cullen—to come in contact with renowned scholars, noble landowners and political decision makers who gave him the chance to carry out independent research. Career-promoting social contacts could be established easily through memberships in scientific associations with high-ranking members. In 1749, Kames proposed that his client Cullen be accepted as a member of the famous Philosophical Society of Edinburgh, and Cullen did the same for Black in 1754. Hence, Cullen and Black were brought into direct contact with important decision makers on the *Board of Trustees*, a planning board that had been commissioned by

[26] Henry Home to William Cullen, n.d., in Thomson 1832 (note 17), 85.
[27] Henry Home to William Cullen, Edinburgh, 14 July 1752, in Thomson 1832 (note 17), 598.
[28] Such as in the case of James Ogilvy, Lord Deskford; ibid.

Fig. 3. Professor Joseph Black (1728–99), chemist. Portrait by David Martin (1787), National Galleries of Scotland (Edinburgh).

the government to advance economic development in Scotland particularly in the fields of textile production and fishery. The two men also made the acquaintance of aristocratic representatives of the *Forfeited and Annexed Estates Commission*, which governed large parts of Scotland on behalf of the crown after the last Jacobite Rebellion was put down in 1746. These contacts gave Cullen and Black the chance to work on behalf of

these boards occasionally, to apply their chemical knowledge in a profitable way, and to call attention to their skills as natural scientists.[29] Moreover, a short time after he had been accepted into the Society, Joseph Black had the opportunity to give a paper on his experiments on magnesia and quicklime and to publish his results in the second volume of the Society's *Essays and Observations Physical and Literary*. He wrote:

> I have been advised to publish my experiments upon magnesia in a collection of papers printed here under the title of Essays physical + literary by a Society of Gentlemen (mostly professors of the University). As most of the papers of this Collection are English I have revised + translated that part of my Thesis into the same language + added besides some experiments upon Quicklime which seem to throw a new light upon the nature of that useful substance. . . . These experiments have been read before the Society above mentioned, approved of + ordered to be printed in their next volume which is to appear in the beginning of winter. . . . I must own this last essay on Quicklime has detained me here somewhat longer than I intended but I may trust to the Opinion of several good Judges my time has not been thrown away + my paper may be of some service in introducing me into the world.[30]

Along with their own publication means, it was, above all, extensive contacts with renowned scholars all over Europe that ensured the Society an influential position in the republic of letters. Through his research and also by publishing his experiments in English, Black was able to achieve a considerable profile not only among colleagues, but also among the politically influential and the noblemen who were interested in the natural sciences. His profile also ensured that he, along with William Cullen, was considered, even in his younger days, as one of the most promising candidates for the famous chair of chemistry at the University of Edinburgh.[31] As a direct competitor of his former teacher and patron Cullen, however, Black had divided loyalties, a situation he tried to mitigate early on. For example, shortly after it became known that Andrew Plummer was to relinquish his teaching duties due to illness, Black informed Cullen that he would renounce his candidacy if need be:

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[29] Roger L. Emerson, 'The Philosophical Society of Edinburgh, 1748–1768', *British Journal for the History of Science* 14 (1981), 133–176: 163.

[30] Joseph Black to John Black, 2 September 1755, Black MSs, Edinburgh University Library (hereafter: EUL), MS. gen. 874. v. Philosophical Society of Edinburgh (ed.), *Essays and Observations Physical and Literary* (Edinburgh 1756), vol. 2.

[31] Thomson 1832 (note 17), 86.

> From some hints I have received, I have a reason to suspect that I am not excluded the possibility of an offer; but I assure you, Doctor, I am absolutely resolved to refuse it, if there is any hopes of its being of any advantage to you. For God's sake, do what you can as soon as possible, and let me know if I can do any thing for you.[32]

What is more, Black expressed his willingness to support Cullen in taking up his work at the medical faculty of Edinburgh, known as the *medical school*. Black himself was more familiar with the faculty's conditions, as he had spent the last four years there before he finished his studies at Edinburgh University. Cullen actually needed the support: The professors of the medical faculty, Plummer himself among them, were split into two factions over Plummer's replacement. They had come out in favour of the physicians Francis Home and Joseph Black over Cullen. Being a protégé of the Duke of Argyll, Cullen was not among the preferred candidates of the *medical school's* professors, so he could not count on the support of his future colleagues. In a letter of congratulations, Black informed Cullen:

> It is indeed very proper you should come as soon as possible, in order to settle matters with respect to the teaching for this winter, as I am afraid you will receive but little help or encouragement from the Professors. They all seem to be very much out of humour at the Town Council's having managed this affair with so little ceremony, and as if the College had no sort of concern in the matter. Plummer himself will certainly be highly incensed; and as the laboratory is entirely his property, you need not expect to obtain the use of it for this winter…[33]

The rebellious stance on the part of the medical faculty and of the senate reflects the fact that although the influence of the Scottish nobility on the staffing of university chairs still existed, there was a growing resistance to their authority on the part of the university faculty. Although the university bodies could not reverse the decision of the town council, they nevertheless tried to deny Cullen a membership in the academic senate as long as Plummer was alive. Cullen took up his teaching activities in the winter term of 1755/1756 as a not fully entitled university member, supported by his assistant Black, who as a doctoral candidate had already argued for a radical reformation of the practice of chemistry teaching.[34] It was not until after Plummer's death in July 1756 that Cullen was neces-

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[32] Joseph Black to William Cullen [summer 1755]. Ibid., 87.
[33] Joseph Black to William Cullen, Edinburgh, 22 November 1755, ibid., 92f.
[34] Arthur L. Donovan, *Philosophical Chemistry in the Scottish Enlightenment* (Edinburgh 1975), 175f.

sarily accepted into the senate as full professor and as a result of this act could endeavour to furnish a new laboratory with the aid of the town council.[35] At the same time, he returned the favour of his supporter and student Black by recommending him to the Duke of Argyll as successor to his former chair at the University of Glasgow.[36] As a result, Black was appointed professor of medicine at the University of Glasgow in 1756.

Client and Broker: The Academic Career of William Robertson

Soon after his appointment, Cullen succeeded in drawing a large number of students into the Edinburgh lecture halls with the range of his courses and in further enhancing the academic reputation of the *medical school*. Compared to England, for example, the reputation of chemists in the Scottish republic of letters depended much more on the quality of their lectures and teaching activities than on their publications.[37] Without an academic position, Cullen and Black would probably not have achieved sufficient legitimation and broad effect. Cullen's reputation was after all also responsible for his receiving the chair of theoretical medicine at the University of Edinburgh in 1766 and that of practical medicine in 1773. William Robertson, who had held the influential office of university principal since 1762, was largely responsible for the promotion of Cullen at the University of Edinburgh. Robertson saw to it that the teaching posts at Edinburgh University were allocated to those members of the city's scholars' scene who were closely related to the moderate faction of the Presbyterian *Scottish Kirk* (the so-called Moderates) and who were, in addition, also connected through friendship and affiliation.[38]

Robertson's own career began in early 1759 with the publication of his book *History of Scotland*, valued highly by the English press primarily because of its balanced attitude towards Mary Stuart, which earned Robertson the status of an unbiased and politically moderate historian.[39]

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[35] Ibid., 74.

[36] Thomson 1832 (note 17), 89.

[37] Jan Golinski, *Science as Public Culture: Chemistry and Enlightenment in Britain, 1760–1820* (Cambridge 1992).

[38] Cf. Richard Sher, *Church and University in the Scottish Enlightenment. The Moderate Literati of Edinburgh* (Edinburgh 1985), chap. 3.

[39] William Robertson, *The History of Scotland, During the Reigns of Queen Mary and of King James VI. Till His Accession to the Crown of England. With a Review of the Scotch History Previous to that Period; And an Appendix Containing Original Papers. In Two Volumes* (London 1759). On Robertson's career see Sher 1985 (note 38), 98–105.

Against the backdrop of his international success as an author, Robertson decided to write a new historical work, but being in the social position of a parish minister, he felt subjected to considerable restrictions. In order to optimise his promotion prospects as a clergyman and as a scholar in equal measure, he turned to his friend from university Sir Gilbert Elliot of Minto in London who, as a member of Parliament and a confidant of Lord Bute, had a high degree of political influence.

Convinced by the academic skills of his client, Elliot at first tried to set up a chair in history at the University of Edinburgh specifically for Robertson.[40] Although Robertson had already framed a detailed lecture scheme together with Elliot, the project failed because of the reluctance of Bute, who already had other plans for Robertson in mind. Ever since he had read his *History of Scotland*, he had tried to convince Robertson to write a history of England.[41] At first, Robertson was rather sceptical of Bute's suggestion as, on the one hand, he did not want to compromise the interests of his friend David Hume who was writing a multivolume work on the same topic[42] and as, on the other hand, he had already compiled material for a study dealing with the regency of Charles V. Bute, however, did not desist from his intention. For strategic reasons, he first promoted William Robertson to the rank of chaplain in July 1761—a post which increased Robertson's status and income only slightly.[43] However, Bute was less concerned about an adequate reward for Robertson's merits with this measure. He rather used his power as patron to make Robertson commit himself to him in the long term and to make him comply with his wishes.

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[40] William Robertson to Gilbert Elliot, Edinburgh, 7 February 1761, NLS, MS. 11009, fols. 79–80; Gilbert Elliot to William Robertson, 3 March 1761, NLS, MS. 3942, fols. 42–43.

[41] Cf. James L. McKelvey, 'William Robertson and Lord Bute', *Studies in Scottish Literature* 6 (July 1968–April 1969), 238–247: 238f.

[42] Cf. William Robertson to Gilbert Elliot, Edinburgh, 7 August 1762, NLS, MS. 11009, fols. 149–152: "Soon after the publication of my last book, I refused very tempting offers from Booksellers as well as the promises of very considerable publick protection, & would on no account hear of entering upon Davids field before he himself had gone through it." Bute was probably hoping that a new English history by Robertson could counteract the sceptical religious interpretations of Hume. See Jeremy J. Cater, 'The Making of Principal Robertson in 1762. Politics and the University of Edinburgh in the Second Half of the Eighteenth Century', *The Scottish Historical Review* 49 (1970), 60–84: 63f.; Stewart J. Brown, 'William Robertson (1721–1793) and the Scottish Enlightenment', in id. (ed.), *William Robertson and the Expansion of Empire* (Cambridge 1997), 7–35: 21.

[43] William Robertson to Gilbert Elliot, Edinburgh, 25 June 1761, NLS, MS. 11009, fols. 81–82; Gilbert Elliot to William Robertson, London, 2 July 1761, NLS, MS. 3942, fols. 44–45.

Initially, Bute's plans had called for Robertson to give up his position as parish minister in Edinburgh and to move to London in order to stay close to the archives.[44] For family and social reasons, however, Robertson did not want to give up either his residence in Edinburgh or his status as a clergyman.[45] Therefore, Bute suggested to Robertson to continue to reside in Scotland and to keep his ministry as chaplain, but to give up his parish ministry in Edinburgh and to assume in return the presidency of the University of Glasgow or the University of Edinburgh.[46] He proposed the latter with a view to the fact that the university principals in Glasgow and Edinburgh were already at an advanced age and in bad health.

On the death of the Principal of Edinburgh University, John Gowdie, on 19 February 1762, Robertson's career was to take a decisive turn. Even a few days before Gowdie's death, Robertson had shown his great interest in a candidacy in a letter to Gilbert Elliot, asking Elliot for his support and advocacy with Bute. He was perfectly aware that a successful application was primarily dependent on the favour of Lord Bute: "The office is in the gift of the Town Council", he wrote to Elliot, "but that you know alters the matter only one remove."[47] Ultimately, Elliot's commitment played only a minor part as Bute—as mentioned above—had already committed himself to William Robertson as new university Principal in November 1761. He delegated his decision to his intermediary Milton, who, in turn, instructed the Town Council in spring 1762 to elect William Robertson as the new principal of the University of Edinburgh. Bute hoped that Robertson, in his capacity as principal, now had the necessary resources that he needed for his historical research. After Robertson had received his post, however, it turned out that his new office at the university involved more work and less income than he had expected, thus limiting his possibilities to complete the study of Charles V he had already begun. Robertson thus entreated Elliot again to speak for him with Lord Bute about appointing him *Historiographer Royal for Scotland*, offering to resign from his parish ministry in return.[48] Bute felt compelled to agree to Robertson's barter, for otherwise the chances for him to soon take up his research on the history

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[44] Lord Cathcart to William Robertson, Pain's Hill, 21 August 1761, NLS, MS. 3942, fols. 48–49.

[45] William Robertson to William Mure, 25 November 1761, in Sher 1985 (note 38), 113.

[46] William Mure to Lord Bute, 30 November 1761, ibid.

[47] William Robertson to Gilbert Elliot, 15 February 1762, NLS, MS. 11009, fols. 105–106, ibid.

[48] William Robertson to Gilbert Elliot, Edinburgh, 7 August 1762, NLS, MS. 11009, fols. 149–152.

of England would dwindle. Through his brokers Elliot and Lord Cathcart, he had Robertson notified that he would accept his request but that he thus also considered the negotiations terminated.[49]

On 6 August 1763, William Robertson was appointed *Historiographer Royal for Scotland* by George III and received an annuity of £200. Bute had resigned from his office as *First Lord of the Treasury* a few months earlier. Released from his obligations to his benefactor, Robertson did not finish his study on Charles V until 1769. His next major project was a history of America, which was published in 1777.[50] In the end, Robertson never wrote a history of England. Throughout his life he also refused to give up his position as a clergyman in Edinburgh.

The patronage relationship between Bute and Robertson is a particularly striking example of skilled eighteenth-century academics being dependent on their patrons for their career but not necessarily being at their patron's mercy. Instead, they could influence their careers to meet the desired conditions through a sophisticated negotiation strategy. Obtaining tenure eventually allowed them to free themselves permanently from allegiance to their patrons.

In the position of university principal, William Robertson hoped to have a certain say himself in the filling of vacant chairs. As there was initially no acknowledged "manager" of Scottish patronage after Bute had resigned, Robertson—as an intermediary between the political elite in London and Edinburgh's town council—had a stronger influence on the assignment of posts in his professional environment than his predecessors. In this he pursued the aim of recruiting professional teaching staff who satisfied his moderate and progressive mindset. Shortly after he had been elected Principal, he asked his benefactor Elliot to be permitted to send him brief opinions on the respective candidates in the case of prospective applications: "I hope therefore you will permit me for the future to write you some account of any Candidate that may offer for any office in the College. I shall do it fairly."[51]

With the vacancy of the sheriff depute in the county of Edinburgh in January 1763, the opportunity arose for Robertson to fill the chairs of moral philosophy and natural philosophy with skilled academics of his

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[49] Lord Cathcart to William Robertson, 4 April 1763, NLS, MS. 3942, fols. 50–51.

[50] William Robertson, *The History of the Reign of the Emperor Charles V.* (London 1769); id., *History of America* (London 1777).

[51] William Robertson to Gilbert Elliot, Edinburgh, 12 August 1762, NLS, MS. 11009, fols. 153–154.

choice and to get rid of unwelcome professors at the same time. Among the latter was James Balfour, professor of moral philosophy in Edinburgh since 1754, who was an orthodox Presbyterian and deliberately used his teaching activities at university to propagate his Calvinistic doctrine of faith. As Balfour also remained rooted in scholastic traditions, corroborated metaphysical speculation as a philosophical approach and resisted the modern philosophical trend of empiricism, William Robertson termed his appointment "a cruel circumstance to the College, & a real & essential loss to the country".[52] In a letter to Elliot, Robertson suggested that Balfour relinquish the renowned chair of moral philosophy to Adam Ferguson and take on the position of the sheriff depute of Edinburgh in return.[53] Adam Ferguson, historian and social ethicist of the Scottish Enlightenment, was a leading representative of the *Moderate Party* and thus a close acquaintance of Robertson. He had held the chair of natural philosophy of the University of Edinburgh since 1759. In the event of his relocation, Robertson advocated that the vacant chair of natural philosophy be given to Ferguson's cousin James Russel, surgeon and scientist, who had been known to him for several years in his role as founder member of the Select Society and as co-editor of the literary journal *Edinburgh Review*. His plans were realised in May 1764, however, when Balfour was appointed to the chair of public law upon the recommendation of Robertson and when Adam Ferguson received the chair of moral philosophy in return and James Russel, as Ferguson's successor, the chair of natural philosophy.[54]

In his new position as professor of moral philosophy, Adam Ferguson was exceedingly successful. Even before the negotiations about his relocation were officially finalised, Hugh Blair wrote to David Hume in Paris: "In our Colledge, we are making a great improvement. In Consequence of a Bargain made with Ja. Russel Bruce the Professor of the Law of Nature & Nations goes out, Balfour of Pilrig moves into his place, Fergusson into the Chair of Moral Philosophy, and Russel into that of Natural. Is not this Clever?"[55] A few months later, he was already able to report to Hume:

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[52] Alexander Bower, *The History of the University of Edinburgh* (Edinburgh 1817), vol. 2, 374–375; Sher 1985 (note 38), 118; William Robertson to Gilbert Elliot, Edinburgh, 8 January 1763, NLS, MS. 11009, fol. 163–164.

[53] William Robertson to Gilbert Elliot, Edinburgh, 8 January 1763, NLS, MS. 11009, fols. 163–164.

[54] Cf. Sher 1985 (note 38), 118–119.

[55] Hugh Blair to David Hume, Edinburgh, 6 April 1764, NLS, MS. 23153, fol. 52.

"Our Colledge is very flourishing. Fergusson & Russel are both beginning their new Courses with much applause."[56]

Apart from Adam Ferguson and James Russel, other protégés of Robertson's were Joseph Black, who in return assumed the chair of chemistry as successor to Cullen, as well as Dugald Stewart, John Hope and John Gregory, who gained international reputation as professors of philosophy and medicine in the republic of letters. With William Robertson as its chairman, the University of Edinburgh evolved into a centre of learning of the European Enlightenment in which the scientific and medical faculty, in its international importance, gradually took the place of Leyden. Fundamental to this was a strategic patronage policy which considerably benefited the rise of innovative researchers but which was not unselfishly motivated: in accordance with the spirit of the time, patrons and brokers such as Argyll, Bute, Kames and Elliot always had an eye on the common interest, but being land owners, they were primarily also interested in scientific and practical knowledge because it directly complied with their pragmatic ambitions—the reformation of the Scottish agricultural sector. As the social status of, above all, the Scottish (landed) gentry was much rather based on the amount of annual rental income than on genealogy, the noble patrons were constantly anxious to increase the economic power and the value of their manor.

In addition, it was their intention to fill the top positions of the university with liberal and moderate Calvinists, who, being convinced Whigs, were ready to cooperate with the political elite in London and who believed in the necessity of a stable social order; an order that could only be maintained by what Hugh Blair once described as "the duty of subordination to lawful superiors".[57] Thus, at the same time, the aristocratic recruiting policy aimed to deny the members of the Scottish Presbyterian Church's social radical wing access to university teaching.

Conclusion

Even in the Age of Enlightenment Scottish scholars remained dependent on social relations to the Scottish nobility if they aspired to a professional career at university or in the higher judiciary and administration. Although achievement-oriented qualification attributes increasingly decided the

[56] Hugh Blair to David Hume, Edinburgh, 15 November 1764, NLS, MS. 23153, fol. 54.
[57] Hugh Blair, *Sermons* (Edinburgh 1777), vol. 1, 16; Sher 1985 (note 38), 139.

career opportunities of an ambitious scholar in the eighteenth century, social mobility and a career continued to be virtually impossible without a strategic mobilisation of patronage relations, which held particularly true for those who were or wanted to be members of the upper classes.[58] On the other hand, the eighteenth-century patronage system offered new options to scholars: It was less the mentoring of a single patron that provided for the scholar's financial independence than increasingly the office, which was secured with the mostly selective support of a patron. Compared to London or Paris, there were no Grub Street authors in Edinburgh who tried to live from their pen alone without any office or sinecure: For the most part, the Scottish Enlightenment philosophers came from the educated middle class and funded their literary activities by practicing a profession.[59] However, as many of the profitable offices that Scottish scholars could obtain through patronage (such as the office of university professor, judge or parish minister) were tenured, the traditional patronage relationship, which was aimed at longevity, paradoxically—though historically plausible—became less important. This not least of all also led to the fact that the reliability of academic findings was not as strongly connected to the personal patronage relationship as had still been the case in the seventeenth century.[60] Rather, the office of the scholar himself became increasingly important in advancing the social recognition of the scholar's research. It was especially the chair of university professor that finally internalised the epistemological credibility which had formerly been associated with the social rank of a patron. These examples demonstrate the importance of examining the transition in forms of patronage and their consequences for the broader field of academic scholarship.

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[58] See also Biagioli 1993 (note 13), 16.

[59] Roger L. Emerson, 'The Social Composition of Enlightened Scotland: the Select Society of Edinburgh, 1754–1764', *Studies on Voltaire and the Eighteenth Century* 114 (1973), 291–329: 322.

[60] Cf. Biagioli 1993 (note 13), 16f.

"ON THE MEANS OF BECOMING FAMOUS IN THE LEARNED WORLD": PRACTICES IN SCHOLARLY CONSTITUTION OF STATUS AND THE EMERGENCE OF A MORAL ECONOMY OF KNOWLEDGE IN THE EIGHTEENTH CENTURY

Marian Füssel

As a result of differentiation in the print market during the eighteenth century, new market-like structures for gaining scholarly status appeared, complementing the older corporate-hierarchical mechanisms of social advancement.[1] The prestige within the virtual realm of the European republic of letters which had always accompanied rank in the university or promotion by a noble patron now gained a special meaning among the enlightened public.[2] Accompanying these new possibilities were disparaging voices that criticised an exaggerated scholarly addiction to fame and honour that contradicted older theological and new enlightened values. Based on these discourses, the present article traces changes in the practices of achieving learned status from the perspective of a moral economy of knowledge, i.e. a contemporary set of rules, values and legitimate actions. The term "moral economy" was coined by Edward Palmer Thompson at the beginning of the 1970s in works dealing with the culture of the English working class during the Ancien Régime's passage to modernity.[3] Thompson argued that the rebellious actions of workers could no longer be explained in terms of classical Marxist political economy, but followed a moral code that determined acceptance or rejection of the impositions of the ruling classes. Meanwhile, the term has been

[1] Helmuth Kiesel and Paul Münch, *Gesellschaft und Literatur im 18. Jahrhundert. Vorraussetzungen und Entstehung des literarischen Marktes in Deutschland* (München 1977); Siegfried J. Schmidt, *Die Selbstorganisation des Sozialsystems Literatur im 18. Jahrhundert* (Frankfurt/M. 1989).

[2] On the universities, see Marian Füssel, *Gelehrtenkultur als symbolische Praxis. Rang, Ritual und Konflikt an der Universität der Frühen Neuzeit* (Darmstadt 2006); William Clark, *Academic Charisma and the Origins of the Research University* (Chicago 2006). On the mechanisms of court society, see exemplarily Mario Biagioli, *Galileo, Courtier. The Practice of Science in the Culture of Absolutism* (Chicago 1993); see also the short overview by Michael Wintroub, 'Court Society', in Arne Hessenbruch (ed.), *Reader's Guide to The History of Science* (Chicago and London 2000), 154–157.

[3] Edward Palmer Thompson, 'The Moral Economy of the English Crowd in the 18th Century', *Past and Present* 50 (1971), 76–136.

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established in historical research far beyond the world of bread prices and hunger revolts, where it is removed from its original meaning. Steven Shapin, for example, uses it as an analytical tool in his famous work on seventeenth-century England, *A Social History of Truth*. He introduces the term "moral economy" to describe the strong connection between social and epistemological conditions for claims of validity:

> To the aggregate of individuals we need to add the morally textured relations between them, notions like authority and trust and the socially situated norms which identify who is to be trusted, and at what price trust is to be withheld. The epistemological paradox can be repaired only by removing solitary knowers from the center of knowledge-making scenes and replacing them with a moral economy.[4]

An attempt at further theoretical clarification was made in 1995—one year after the publication of Shapin's book—by Lorraine Daston.[5] As the "moral economies of science" Daston defines a "web of affect-saturated values that stand and function in well-defined relationship to one another."[6] "Moral" in this case has simultaneous psychological and normative connotations. Their economy becomes a "balanced system of emotional forces".[7] But the emphasis on affectivity and valuation this introduces should not be seen as having individual psychological connotations; it refers instead to collective schemes of thought, perception and action. Daston, following Ludwik Fleck, therefore speaks of a "Gefühls- und Denkkollektiv" [collective of feeling and thought].[8] In my view the moral economy of knowledge can be even further substantiated by including its forms embodied in the learned habitus.[9] By doing this we open the possibility of bringing the learned subjects back in without the burdensome inheritance of individualistic and subjective philosophy.[10] The habitus forms

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[4] Steven Shapin, *A Social History of Truth. Civility and Science in Seventeenth-Century England* (Chicago 1994), 27 and 34ff.

[5] Lorraine Daston, 'The Moral Economy of Science', *Osiris* 10 (1995), 3–24.

[6] Ibid., 4.

[7] Ibid.

[8] Ibid., 5.

[9] See Christopher Lawrence and Steven Shapin (eds.), *Science Incarnate: Historical Embodiments of Natural Knowledge* (Chicago 1998); on professorial habitus, see Marian Füssel, 'Die zwei Körper des Professors. Zur Geschichte des akademischen Habitus in der Frühen Neuzeit', in Horst Carl and Friedrich Lenger (eds.), *Universalität in der Provinz—die vormoderne Landesuniversität zwischen korporativer Autonomie, staatlicher Abhängigkeit und gelehrten Lebenswelten* (Darmstadt 2009), 209–232.

[10] See Marian Füssel, 'Die Rückkehr des Subjekts in der Kulturgeschichte. Beobachtungen aus praxeologischer Perspektive', in Stefan Deines, Stephan Jaeger and Ansgar Nünning

a kind of link between the value system of the moral economy and the practices of knowledge as the manifold ways of producing, appropriating and distributing knowledge.[11] Based on these rather general reflections, the particular focus in what follows will be on the specific historicity of those "webs" and value schemes that concern the social advancement and recognition of the scholar in the eighteenth century.[12]

Ordering the Republic of Letters

The contemporary ideal of community and communication among European scholars formed the so-called Republic of Letters, the *respublica literaria* or *république des lettres*. Research on this virtual and practical community of communication has been done in recent decades, asking several different questions from many different perspectives.[13] On the one hand, self-descriptions by academics, their ideals and their metaphors were analysed. On the other hand, the actual processes of exchange and communication to be found in academic correspondence and networks were investigated.[14] Thus, in the case of the latter, many studies have pointed to the significance of academic travel, the expanding book market, or the development of scientific academies.[15] The term

(eds.), *Historisierte Subjekte—Subjektivierte Historie. Zur Verfügbarkeit und Unverfügbarkeit von Geschichte* (Berlin 2003), 141–159.

[11] On practices in the history of science, see Hans Erich Bödeker, Peter Hans Reill and Jürgen Schlumbohm (eds.), *Wissenschaft als kulturelle Praxis 1750–1900* (Göttingen 1999); Peter Becker and William Clark (eds.), *Little Tools of Knowledge: Historical Essays on Academic and Bureaucratic Practices* (Ann Arbor 2001); Helmut Zedelmaier and Martin Mulsow (eds.), *Die Praktiken der Gelehrsamkeit in der frühen Neuzeit* (Tübingen 2001).

[12] See the section "Die moralische Ökonomie des Wissens" in Ulrich Johannes Schneider (ed.), *Kulturen des Wissens im 18. Jahrhundert. Beiträge der Jahrestagung der Deutschen Gesellschaft für die Erforschung des 18. Jahrhunderts. Herzog August Bibliothek Wolfenbüttel, 15.–18. Oktober 2006* (Berlin 2008).

[13] For a concise overview of the history of previous research on the Republic of Letters, see Marc Fumaroli, 'The Republic of Letters', *Diogenes* 143 (1988), 129–152: 129–134.

[14] Ulrich J. Schneider (ed.), *Kultur der Kommunikation. Die europäische Gelehrtenrepublik im Zeitalter von Leibniz und Lessing* (Wiesbaden 2005); Michael Kempe, 'Gelehrte Korrespondenzen. Frühneuzeitliche Wissenschaftskultur im Medium postalischer Kommunikation', in Fabio Crivellari et al. (eds.), *Die Medien der Geschichte* (Konstanz 2004), 407–429; Hans Bots and Françoise Waquet (eds.), *Commercium litterarium. La Communication dans la république des lettres / Forms of Communication in the Republic of Letters 1600–1750* (Amsterdam and Maarsen 1994); Marten Ultee, 'The Republic of Letters: Learned correspondence, 1680–1720', *The Seventeenth Century* 2 (1987), 95–112.

[15] Hans Erich Bödeker, '"Sehen, hören, sammeln und schreiben." Gelehrte Reisen im Kommunikationssystem der Gelehrtenrepublik', *Paedagogica Historica* 38 (2002), 505–532. On the connection between scientific societies and academies and the Republic of Letters,

respublica literaria apparently first appeared in the correspondence of Italian humanists at the beginning of the fifteenth century, where it was closely connected to the *respublica christiana*.[16] But only with academics such as Aldus Manutius or Erasmus of Rotterdam did the *respublica literaria* begin to spread across Europe towards the borders of Christianity around 1500.[17] In particular, the Republic of Letters in the seventeenth century was the main object of research at first.[18] Of all contemporary theoretical debates concerning the *respublica literaria*, the one written by the Spaniard Diego de Saavedra Fajardo was the most influential, and has been available in German translation since 1748.[19] During the eighteenth century constitutional debates[20] gained momentum within the Republic of Letters. Thus, an anonymous publisher of a journal entitled *Deutsche REPUBLIC der Gelehrten 1737* stated that "the question of the form of the republic of letters is still controversial and it is still not decided upon if it shall be democratic, aristocratic of monarchistic."[21] Modern research on the Enlightenment used this term repeatedly to describe the overall intellectual field of the eighteenth century.[22] Nowadays an effort is being made to establish a conceptual distinction between the *république des lettres* and *république des sciences*, i.e. towards a better understanding of the

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see Wolfgang Hardtwig, *Genossenschaft, Sekte, Verein: Geschichte der freien Vereinigung in Deutschland*, vol. 1: *Vom Spätmittelalter bis zur Französischen Revolution* (München 1997), 259–285.

16 Fumaroli 1988 (note 13), 136f.

17 Fritz Schalk, 'Von Erasmus Respublica literaria zur Gelehrtenrepublik der Aufklärung', in id., *Studien zur französischen Aufklärung* (Frankfurt/M. 1977), 143–163.

18 Hans Bots, 'Die respublica litteraria. Wunschbild der europäischen Gelehrtenwelt', in Jean Pierre Schobinger (ed.), *Grundriss der Geschichte der Philosophie*, vol. 1/1: *Die Philosophie des 17. Jahrhunderts* (Basel 1998), 31–48; Sebastian Neumeister and Conrad Wiedemann (eds.), *Res publica litteraria: die Institution der Gelehrsamkeit in der frühen Neuzeit* (Wiesbaden 1987), 2 vols.; Wilhelm Kühlmann, *Gelehrtenrepublik und Fürstenstaat. Entwicklung und Kritik des deutschen Späthumanismus in der Literatur des Barockzeitalters* (Tübingen 1982).

19 Diego de Saavedra Fajadro, *Die gelehrte Republik* . . . (Leipzig 1748). For the context of this work, see Herbert Jaumann, 'Ratio clausa. Die Trennung von Erkenntnis und Kommunikation in gelehrten Abhandlungen zur Respublica literaria um 1700 und der europäische Kontext', in Neumeister and Wiedemann 1987 (note 18) 409–429: 410f. and 413f.

20 See Jaumann 1987 (note 19), 418f. Gerhard Sauder, '"Galante Ethica" und aufgeklärte Öffentlichkeit in der Gelehrtenrepublik', in Rolf Grimminger (ed.), *Deutsche Aufklärung bis zur Französischen Revolution 1680–1789* (München and Wien 1980), 219–238: 229ff.

21 See Jaumann 1987 (note 19), 409.

22 See for example the titles chosen by Daniel Roche, *Les Républicains des lettres. Gens de culture et Lumières au XVIII^e siècle* (Paris 1988) or Dena Goodman, *The Republic of Letters. A Cultural History of the French Enlightenment* (Ithaca and London 1994).

process of differentiation among the sciences.[23] The frequently quoted ideal of the Republic of Letters as an autonomous community of seekers after truth was formulated by Pierre Bayle in his *Dictionnaire Historique et Critique* in 1696:

> The Republic of Letters is a state extremely free. The Empire of Truth and Reason is only acknowledged in it; and under their protection an innocent War is waged against any one whatever. Friends ought to be on their Guard there against Friends, Fathers against Children, Fathers-in-law against their Sons-in-law, as in the Iron Age: non hospes ab hospite tutus, non socer a genero [Ovid. Met. I, 144]. . . . Every body there is both Sovereign and under every body's Jurisdiction.[24]

Against the background of certain alienation from social consideration, Lorraine Daston assigned discussion about the ideal of the republic of letters in the eighteenth century to the long-term "moral history" of objectivity.[25] In a similar context, discussion of the Republic of Letters as a community of values and esteem, in which moral economy functioned as a regulating principle for inclusion and exclusion, has recently intensified.[26] Herbert Jaumann described this attribute precisely when he observed, "Those who violate the norms are excluded from communication".[27] Thus, research took a small step away from the idealistic notion that the Republic of Letters did not have imbalances of power and a culture of conflict and dissent.[28] Proto-national special paths and confessional differences were also a focus and have redesigned our current map of the Republic of Letters in more complex as well as more conflictual terms.[29] Very often,

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[23] See *La République des Sciences*, special issue of *Dix-huitième siècle* 40 (2008).

[24] Quoted in Sean Alexander Gurd, *Iphigenias at Aulis: Textual Multiplicity, Radical Philology* (Ithaca 2005), 79.

[25] Lorraine Daston, 'The Ideal and Reality of the Republic of Letters in the Enlightenment', *Science in Context* 4 (1991), 367–386.

[26] Anne Goldgar, *Impolite Learning: Conduct and Community in the Republic of Letters 1680–1750* (New Haven and London 1995); Daniel Roche, 'République des lettres ou royaume des mœurs: la sociabilité vue d'ailleurs', *Revue d'histoire moderne et contemporaine* 43 (1996), 293–306; Martin Mulsow, *Die unanständige Gelehrtenrepublik. Wissen, Libertinage und Kommunikation in der Frühen Neuzeit* (Stuttgart and Weimar 2007).

[27] Herbert Jaumann, 'Das Projekt des Universalismus. Zum Konzept der Respublica litteraria in der frühen Neuzeit', in Peter-Eckhard Knabe and Johannes Thiele (eds.), *Über Texte. Festschrift Karl-Ludwig Selig* (Tübingen 1997), 149–163: 162.

[28] See Marian Füssel, 'Gelehrte Streitkulturen. Zur sozialen Praxis des Gelehrtenstreits im 17. und 18. Jahrhundert', in Markus Meumann (ed.), *Ordnungen des "Wissens"—Ordnungen des Streitens. Gelehrte Debatten des 17./18. Jahrhunderts in diskursanalytischer Perspektive* (Berlin 2010) (in press).

[29] Kasper Rijsberg Eskildsen, 'How Germany Left the Republic of Letters', *Journal of the History of Ideas* 65 (2004), 421–432; Herbert Jaumann, 'Gibt es eine katholische Respublica

though, research simply followed the self-descriptions of academics, because the liberal and universal norms of communication seemed to fit perfectly into the narrative of the genesis of the modern bourgeois public sphere.[30] Thus, Herbert Jaumann insisted in this context, and rightly so, on focusing more closely on "the differentiation between the self-description of the academic state of communication using the concept of the Respublica litteraria as a non-party and universal position and the factual position from the outside on the same concept".[31] A learned universalism that was taught beyond all particular positions was articulated on a social level. This aspect has to be most consistently included in analysis.

Practices of Scholarship and Constitution of Status

Which practices led to social progress and to what degree were they criticized? Here we must mention all forms of reviewing, public scolding of colleagues, plagiarism and dispute, as well as the announcement of hypertrophic book projects or lectures that were not held, forms of favoritism and patronage and pretentiousness not befitting one's rank, made evident in symbolic forms such as clothes or titles, etc. This paper, however, deals for the most part only with practices that focus on the virtual space of the Republic of Letters and the enlightened public sphere, respectively. Corporative and institutional contexts such as the court and the university can not be dealt with here to any extent.[32] Practices concerning the academic treatment of knowledge not only shaped single careers, but also influenced cultural labelling of the academic person, e.g. categorization

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litteraria? Zum problematischen Konzept der Gelehrtenrepublik in der Frühen Neuzeit', in id. (ed.), *Kaspar Schoppe (1576–1649). Philologe im Dienste der Gegenreformation* (Frankfurt/M. 1998), 361–379; id. (ed.), *Die europäische Gelehrtenrepublik im Zeitalter des Konfessionalismus / The European Republic of Letters in the Age of Confessionalism* (Wiesbaden 2001).

[30] For a discussion of the connection between the Republic of Letters and the public sphere as a critique on Habermas's model of the public sphere, see Heinrich Bosse, 'Die gelehrte Republik', in Hans-Wolf Jäger (ed.), *Öffentlichkeit im 18. Jahrhundert* (Göttingen 1997), 51–76; Andreas Gestrich, *Absolutismus und Öffentlichkeit. Politische Kommunikation in Deutschland zu Beginn des 18. Jahrhunderts* (Göttingen 1994), 100–114.

[31] Jaumann 1997 (note 27), 161.

[32] A similar analytical division of these phenomena was already suggested by Georg Paul Hönn in his *Betrugs-Lexicon* of 1724, where he treats forms of fraud such as "savants", "professors or academic teachers" and "students" separately. See Georg Paul Hönn, *Betrugs-Lexicon worinnen die meisten Betrügereyen in allen Ständen nebst denen darwider guten Theils dienenden Mitteln entdecket* (reprint of Coburg 1724 edn., Leipzig 1981), 169–174 (savants), 291–294 (professors) and 408–415 (students).

as a mass-writer, a charlatan, pedant, wrangler, etc.[33] Johann Burckhard Mencke's famous speech about *The Charlatanry of the Learned* [Charlatanerie der Gelehrten, 1715] already offered a kind of overview of the whole range of academic bad habits and established the label of the charlatan, a word that was already far removed in meaning from its original use to describe medical showmanship, and had become a general term for labelling bad academic habits similar to pedantry.[34] Less well known is the satirical work *How to become Famous in the Academic World* [Die Mittel in der gelehrten Welt berühmt zu werden], published by the diplomat and art critic Christian Ludwig Hagedorn (1712–1780) in 1736, that also mentioned many academic practices designed to gain social prestige but which basically violated implicit academic decorum.[35] This was already clear in the first chapter of his anti-decorum talks "On the Necessity to Conceal both the Teachers and the Sources of our Sciences", followed by passages about writing books, academic disputes, or the chance to gain fame beyond the writing of books. In the second paragraph of his introduction, Hagedorn provides a division of scholars into two categories. The first one is characterized by a "reasonable and commendable love of honour", but this is not what his work is about.[36] Rather he addresses the

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[33] On a positive, corporate concept of the "learned", see Heinrich Bosse, 'Gelehrte und Gebildete—die Kinder des 1. Standes', *Das achtzehnte Jahrhundert* 32 (2008), 13–37.

[34] Johann Burckhard Mencke, *De charlataneria eruditorum Declamationes duae* (Leipzig 1715); German: *Herrn Jo. Burckhardt Menckens Zwey Reden von der Charlatanerie oder Marktschreyerey der Gelehrten, nebst verschiedener Autoren Anmerckungen. Mit Genehmhaltung des Hn. Verfassers nach der letzten vollständigsten Auflage übersetzt* (reprint of Leipzig 1716 edn., München 1981); on the history of its edition and reception, see Henry Louis Mencken: 'Preface by the Editor', in id. (ed.), *The Charlatanry of the Learned (De Charlataneria Eruditorum, 1715) by Johann Burkhard Mencken (1674–1732)* (New York 1937), 3–45: 27–45; on the general context, see Marian Füssel, 'The Charlatanry of the Learned: On the Moral Economy of the Republic of Letters in Eighteenth-Century Germany', *Cultural and Social History* 3 (2006), 287–300.

[35] Christian Ludwig Hagedorn, *Die Mittel in der gelehrten Welt berühmt zu werden* (Dresden 1736); on Hagedorn, see Moritz Stübel, *Christian Ludwig von Hagedorn: ein Diplomat und Sammler des 18. Jahrhunderts* (Leipzig 1912), 77; on the context of his brother Friedrich and the Bodmer/Gottsched-controversy, see Steffen Martus, *Friedrich von Hagedorn—Konstellationen der Aufklärung* (Berlin and New York 1999), 256.

[36] Zedler's Lexicon distinguishes between honour, reputation and fame as follows: "Reputation is the good opinion people have about one human's abilities and communicate in public. This is distinguished from honour and fame in a certain way. Honour is the good opinion people have of themselves and fame is renown ex post, which can make a human's virtues and vices popular." 'Ruhm', in Johann Heinrich Zedler, *Grosses vollständiges Universal-Lexicon* . . . (Leipzig and Halle 1742), vol. 32, col. 1594. Against this background, the article on "Ruhm-Begierde" [desire for reputation] distinguishes between the latter and "Ehr-Begierde" [desire for honour]: "The desire for reputation is an attitude to make people realise the ability one has and make it popular in their judgment. It is

second category, those using "scholarship" simply as a "weapon of vanity", which in turn is divided into "two lots". The first lot is more genteel and capable of artifice, being at least partially erudite, something it uses to "glue the eyes" of the ignorant. The second lot is less skilled, is constantly trying in vain to imitate the first lot, and is thus often exposed to ridicule. The ensuing discussion of the citizenship rights of the second genre within the Republic of Letters turns into a very subtle critique of mass writing and the laws of the market, as scholars in the second category were much "busier" than in the former and provided "new writings at all book fairs".[37] While the one side was constantly "late to deliver" its academic works, the other side did not hesitate to boost the prosperity of the economy of knowledge with the "unripened fruit", of their circuitous lectures, explanatory notes followed by even more explanatory notes, and work ornamented with copper engravings rather than "solid thoughts".[38] But the discussion of citizen rights in the Republic of Letters also points to the functions of inclusion and exclusion in a moral economy that are ironically reflected here. In the third chapter, Hagedorn suggests that academic beginners should always assent to the "prevailing opinion" and thus introduces ex negativo the ideals of critiquing preconceptions and forming one's own capacity for judgment. This is followed by three chapters about writing books (4–6), that elaborate on the problem of plagiarism. Hagedorn's remarks show how publication already reflected class in society: more famous scholars could simply abandon complex titles while less famous scholars had to choose preferably many and long titles. Highly illuminating for understanding the crumbling norms of class status, for instance in the case of dress code, is the following note about the pictorial representation of the author: "Concerning the depictions of authors in copper engravings, the police ordinance is not that strict, when even a schoolmaster could be depicted to the admirers of pictures in a

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distinguished from the desire for honour, ambition and talking about one's own reputation [Ruhmredigkeit]. The difference between the desire for reputation and the desire for honour is easy to determine when you know how honour and reputation can be distinguished. Honour is the good opinion that other people have about a person's abilities; but when this opinion is articulated and made known in the public sphere through speech, it is called reputation. In the same way you can a have a desire for honour without searching for special reputation. Thus ambition and desire for reputation is not the same." See 'Ruhm-Begierde', ibid., 1596.

37 On the criticism of writing too much, see the references in Gunter E. Grimm, *Letternkultur. Wissenschaftskritik und antigelehrtes Dichten in Deutschland von der Renaissance bis zum Sturm und Drang* (Tübingen 1998), 176f.

38 Hagedorn 1736 (note 35), 13f.

brocade or some other gilded dress, probably with a combed carre-wig, especially with a more friendly face than the original would have."[39] One of the most important measures affecting public perception of enhanced academic prestige doubtless is dispute and critique, to both of which the author dedicated six more chapters (7–12). Thus it was shown already at the beginning that the metaphor of the Republic of Letters could always stand for critique of the political public sphere, for instance when it is written that "both in the case of the academics, and the case of the political republic [you can find] that agitation and wars, if not necessary and useful for all but for many, were not at all inevitable. One is convinced that in case of academic dispute victory was praiseworthy: that is why so many fight an academic war, probably in order to carry away the honour of victory."[40] As a central maxim for a successful academic habitus of dispute, Hagedorn states: "Every opinion, differing from our own, is a mistake."[41] The opponent's opinion was therefore false precisely because it was the opinion of the opponent and because this results in both imagining wrongly to be right; this is taken as a reason to legitimize a just academic war. Apart from the undoubtedly proven legitimacy of dispute and the right choice of opponents, the appropriate style of the polemic pamphlet is discussed here. After the "means to gain external fame" as practices of gaining fame among absentees has been discussed, a discussion of practices for gaining credit under the conditions of face to face communication is about to follow.[42] In conversation, you should include academic knowledge that you have learned elsewhere, always applaud the discussion leader in a circle of people or throw a bunch of written papers into the fireplace and once you are sure they are burning properly, explain to your opponent that you would rather sacrifice you own writings to the fire than leave them "unedited to posterity".[43] In addition to such manoeuvres, you should get yourself a bounteous cabinet full of coins and natural objects or selected writings in a library in order to be seen as a great scholar on the basis of material possessions.[44] Hagedorn devoted the

[39] Ibid., 65.
[40] Ibid., 73.
[41] Ibid., 75.
[42] Ibid., 101–111. On the discussion of face to face communication as a question of societies of communication among present or absent actors, see Rudolf Schlögl, 'Kommunikation und Vergesellschaftung unter Anwesenden. Formen des Sozialen und ihre Transformation in der Frühen Neuzeit', *Geschichte und Gesellschaft* 34 (2008), 155–224.
[43] Hagedorn 1736 (note 35), 105.
[44] Ibid., 107–111. Similar already Hönn 1981 (note 32), 171.

end of his book to two very special "kinds" of scholars, the poly-historian and the teacher, in order to finally commit himself to the characteristics of academic "bogus-giants" who seem to appear much smaller at close range than their fame would suggest from far away.[45] Finally, he thanks the reader for having taken such great pains with his mediocre work. This is not without a certain irony; Hagedorn of all people complained to his brother Friedrich years later that he did not say anything about the quality and success of his "*Means*", and even asks if this is "a lost cause?"[46] But Friedrich reassured his brother in a letter of 23 November 1753:

> It cannot be denied that your *Means* have a value of their own and today they are still very popular in Switzerland, as one highly intelligent Swiss man assured me this year without being asked. That they are not publicly mentioned more often is owed to the fact that those who write books in order to be considered Daedalian, treat as worthy only topics already covered by Gottsched and Bodmer.[47]

Discussing the quest for reputation and prolific writing was not only limited to the period of the early Enlightenment and its media. A reaction to Hagedorn's writing can be found in a 1771 edition of the *Tapeten* [Wall Papers], a weekly periodical published in the 1770s by the Wittenberg professor of mathematics Johann Jacob Ebert (1737–1805). In the 11th volume of the *Tapeten* a certain Mr. Alexander Gernegroß [cockalorum] writes to the editor, one manufacturer of wall papers named Zachäus, about his desire to become famous:

> Dear Zachäus! I have the indescribable ambition of eternalising my name—an ambition that makes me cry due to certain difficulties. . . . I adopted all the devices of the learned to finally become what I aspire to be—famous, Mr. Zachäus, namely in the historia litteraria. . . . Thank Goodness I have not written anything at all yet. . . . Dear Zachäus, I am often smug about my titles; I like to read them when they are printed, hoping that littera scripta manet and that far ensuing ages will know who I was and remember me.[48]

In the course of different suggestions Hagedorn's writing is explicitly cited, too.[49] In the 12th volume of the *Tapeten*, Gernegroß receives a

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[45] Hagedorn 1736 (note 35), 129f.

[46] [Gerhard Anton] Gramberg, 'Nachtrage zum Etwas über Liscow', *Neue Irene. Monatsschrift* (1806), 109–146: 133.

[47] Johann Joachim Eschenburg (ed.), *Friedrichs von Hagedorn Poetische Werke, Fünfter Theil, Auszüge des von Hagedornschen Briefwechsels* (Hamburg 1800), 39–41: 40.

[48] [Johann Jacob Ebert], *Tapeten, Erstes und zweytes Dutzend* (Wittenberg 1771), 81–88: 82f.

[49] Ibid., 85.

reply: The "first, best and easiest instrument" would be "authorship without a doubt", for nowadays nothing would be easier than "the art of writing a book".[50] However, if he should find it too troublesome, for writing "causes some movements of the hands", he would give other advice: "In any case, announce a learned book, let it be printed in fair-catalogues and all newspapers, so you will become famous enough and will be called a great academic, even if the book is never published."[51] Here, Hagedorn's *Means* have actually turned into a reference within the moral-economic discourse of self-understanding in the academic public sphere. Appropriate publishing was a subject of moral consideration throughout the whole eighteenth century, as in Christoph August Heumann's *Political Philosopher* [Der politische Philosophus, 1714] or Georg Friedrich Meier's *Philosophical Ethics* [Philosophische Sittenlehre, 1761], for example. In his chapter "On the prudence of being honoured" Heumann explains that

> through curious erudition one can achieve general respect, which consists not only in gaining fame and reputation at home, but also abroad. Just as one cannot admire a buried and therefore unknown treasure, one says about the academics: Loquere, ut te videam. Let me tell you: An Academic has to prove his skills by writing books, if he wants to be a V.[ir] C.[larissimus]. But as most writers make themselves more well-known than famous throughout the world, the question remains how one can make oneself quite famous thereby.[52]

In what follows, Heumann provides his readers with a whole range of rules to ensure certain fame by using the right and successful way of publishing. One should write a book, that, first of all, "can be of exceeding usefulness for many" secondly one should "choose a subject that has not or not exhaustively and in-depth been treated by others yet", to this end, thirdly one should "take all efforts and really extensively take one's time to write a book". One should also be well versed in the academic field the book belongs to and last but not least one should make use of a proper Latin style. Giving so many hints about the eventualities and risks of the attainment of fame, Heumann feels obliged to avert any suspicion that he would cite from the *Macchiavellismo literario*—a term deriving from a

[50] Ibid., 89–96, here 92f.
[51] Ibid., 95.
[52] Christoph August Heumann, *Der politische Philosophus, das ist vernunftmässige Anweisung zur Klugheit im gemeinen Leben* (reprint of Frankfurt and Leipzig 1724 edn., Frankfurt/M. 1972), 220ff.

book of the same name by the Königsberg theologian Michael Lilienthal (1686–1750), published in 1731.[53] A wise man would in fact search

> for the fame of a learned man not only for his own benefit, but also for the advantage of others. . . . For a famous man is like a shining light, that guides the errant on the right track. I think that such a man of general respect and authority is capable of suppressing the wrong religion and promoting the right one, just like eradicating falsity and reproducing the genuine truth.[54]

As Heumann sees it, the writing of books and the pursuit of glory cannot be separated from each other. Concerning the pursuit of honour, the Halle professor of philosophy Georg Friedrich Meier explained some decades later: The learned should

> in secrecy and by tireless studying aim for excellent eruditeness and write a book and—as Horace says—leave it alone and unpublished for nine years. Having extinguished all the mistakes properly, they are advised to publish it. Unfortunately, a few academics are too fearful, making corrections until they die or losing the jolly fire of youth and therefore corrupting their work. On the other hand, an unlimited number of academics are committed to the opposite kind of debauchery. Before having learned enough, they are already into book-writing. Having barely written them down, they pass their writings over to the printing press and they cannot wait to become famous among the academic world. It is true that they make themselves well-known, but hence not famous.[55]

Heumann and Meier do not write satirical texts, but moral codes of behaviour. The problems mentioned occur in almost every academic code of behaviour and even the argumentations and categories seem to become blurred in one single field of moral-economic discourse, for the goal of satire—as contemporaries grasped it—was to provide orientation and improve mankind by correcting human grievances.[56] Thus Johann

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[53] Michael Lilienthal, *De Machiavellismo literario sive de perversis quorundam in republica literaria inclarescendi artibus dissertatio historico-moralis* (Königsberg and Leipzig 1713). See Martin Gierl, *Pietismus und Aufklärung. Theologische Polemik und die Kommunikationsreform der Wissenschaft am Ende des 17. Jahrhunderts* (Göttingen 1997), 561–564.

[54] Heumann 1972 (note 52), 230f.

[55] Georg Friedrich Meiers . . . *philosophische Sittenlehre* (Halle 1761), vol. 5, 499f. On Meier, see Günter Schenk, *Leben und Werk des halleschen Aufklärers Georg Friedrich Meier* (Halle 1994).

[56] On satire of the learned in the eighteenth century, see Grimm 1998 (note 37); Alexander Košenina, *Der gelehrte Narr. Gelehrtensatire seit der Aufklärung* (Göttingen 2003); Ronald Dietrich, *Der Gelehrte in der Literatur. Literarische Perspektiven zur Ausdifferenzierung des Wissenschaftssystems* (Würzburg 2003); on eighteenth-century satire in general, see Jörg Schönert, *Roman und Satire im 18. Jahrhundert. Ein Beitrag zur Poetik* (Stuttgart 1969); Harald Kämmerer, *Nur um Himmels willen keine Satyren . . . : deutsche Satire*

Gottlob von Justi published in 1760 in his *Facetious and satirical writings* [Scherzhafte und satyrische Schriften] a "Letter missive to a learned and famous man, of the means of becoming learned and famous".[57] In this book, Justi connects the practices of the making of a reputation at university with practices within the Republic of Letters. The academic practices concentrate mainly on the design of the lectures. Lecturers are advised to read on topics which contain "a lot of erring ideas" in order to elevate oneself above these. A different variant would be to conceal the authors one used for the preparation of one's text and in any case to leave the audience unaware of what kind of "broken-down nag" one is riding.[58] One should deliver a funny paper, full of ridiculousness, and "try to diminish those men who have achieved the greatest fame in our field of science, in every way."[59] Criticism of the exaggerated usage of titles—an established topos of the academic satire—must not be lacking, for it is the form of address that makes clear one's own status: "The academic magnificence and majesty is invisible. For these reasons, it is quite difficult to name the time and hour at which a great learned man actually takes possession of the throne."[60] However, a firm indicator for this purpose consists of "some sounds that please our ears so well. If you hear the titles: Vir Illustris, well and respectably born, Magnificence, and mainly Excellency, twenty to thirty times a day and hear a serenade from day to day, then you can be sure that you are absolutely established on the academic prince's throne."[61] In fact there had been some malicious critics who considered the use of titles of Excellency at universities ridiculous, but the author "fought for the right of the Republic of Letters to hold this title upright tooth and nail."[62] Following the discussion of internal academic customs, Justi addressed the practice of book-writing as an indispensable instrument for becoming learned and famous throughout the whole world.

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und Satiretheorie des 18. Jahrhunderts im Kontext von Anglophilie, Swift-Rezeption und ästhetischer Theorie (Heidelberg 1999).

[57] Johann Heinrich Gottlob Justi, 'Sendschreiben an einen gelehrten und berühmten Mann, von den Mitteln gelehrt und berühmt in der Welt zu werden', in id., *Scherzhafte und satyrische Schriften* (Berlin et al. 1760), 3 vols., I: 42–56.

[58] Ibid., 46.

[59] Ibid., 48.

[60] Ibid., 51. Most influential amongst the criticism of titles were, among others writings, Carolus Henricus Heegius, *Exercitatio critico-historica de titulomania eruditorum, vulgo Titel-Sucht der Gelehrten* (Leipzig 1723). On satire of titles, see Füssel 2006 (note 2), 366–375; Grimm 1998 (note 37), 176 (with reference 66).

[61] Justi 1760 (note 57), 51.

[62] Ibid., 52.

Whereas he had earlier worried endlessly about his assumption that one had to be well versed in the scholarly field about which one wrote, he subsequently had considerably less problems with this. He would collect "the most distinguished text passages", classified by topics, and rearrange them in order not to be publicly accused of "academic burglary". Thus nothing will get in the way of earning academic fame.[63]

A sequel to Mencke's book on charlatanry, published in the late eighteenth century and written by Johann Gabriel Büschel, *On the charlatanry of the academics since Mencke* [Ueber die Charlatanerie der Gelehrten seit Mencken, 1791], deals with comparable topics. Büschel explains in his preface that reading Mencke's book inspired him to produce an updated edition, because nowadays things were even worse than in the times of Mencke. Now he would ask himself: "What would good old Mencke tell us if he was still living today?" In the preface Büschel admits that "charlatanry" means a wide range of academic misbehaviour: "Pedantry, pomposity, avidity, exaggerated pride, affectation, quarrelsomeness, intended fraud" are all characteristics of a charlatan. However, he considered here only those "who played the role of (academic) writers"; while "academics, teachers and others" were beyond his "plan". Büschel uses the popular image of make-up, which fools the audience, too. The practices of academic make-up generally include "announcement in public papers" (23–44) and paratexts such as book-titles (44–80), "dedications" (80–83) and "prefaces" (83–94). He subsequently gets down to the academic charlatanries in particular and initially mentions those, "who deliberately lay violent hands on the German language and style" (96–129). The following arguments appear as an intellectual panorama of the late Enlightenment. The "general ameliorants of the world and its conventions" (129–150) come in first, followed by the "pedagogues" (150–162), the "writers of history and biographies" (162–209), the "learned academic adventurers" (209–213) and the "utopians" (213–236). Büschel finally points to certain practices at the end of his argument, for example when he criticises "the disputes of academics in public papers" (236–242) or plagiarism. This is also evidence that one can encounter in the texts mentioned and in earlier texts: new types of experts, such as pedagogues, for example, become the subject matter of criticism as much as the new media of scientific communication, although the latter can only be treated as personalised matters, as

[63] Ibid., 54f.

Mencke, Büschel and others treated them, and cannot be explained as structural developments.

Finally, a similar panorama unfolds in an essay published in 1801, *On the thirst for fame among academics* [Ueber die Ruhmsucht der Gelehrten].[64] This essay mentions two complaints about the literary world, which always tends to make things younger, not older: "prolific writing, and . . . the addiction of the academics and writers to shining as luminaries." Among other things, criticism and the heretic branding of famous academic authorities and all kinds of adulation are treated as techniques for acquiring honour.

Thus there is a chance to deify a famous academic in order "to become immortal" along with him, or for two mediocre academics to praise each other, or for one to praise himself, or the science to which one is dedicated. "Among all the types of praise", reviews are in fact "the most beneficial". They are comparable to a vote in the British House of Commons, where there is always "a distinctive majority for one party" despite the requests, so that it depends on winning the "necessary majority of votes". Over and over again, the self-differentiating practices of the scientific publishing industry, facilitate deviant conduct without being controlled: not the contents, but the book titles, the book cover, the collar, the copper and the size further the circulation of a written text (162). Books degenerate into objects of status, whose mere possession means to increase fame (152). Some academics perpetually announce new publications and inventions, which never appear (154f.), some actually quote too much, others too little (154). Yes, the greatest fortune of the one thirsting for fame actually seems to occur when a book is prohibited and burned by the executioner in public.[65] There is basically no escape from the logic of distinction in the academic field, as the anonymous author, already educated by Kantian philosophy, finally announces, because according to Fabricius it is precisely those academics who possess the "greatest pride" that "have seemed to condemn every type of fame". Their theoretical reason was actually so different from practical reason, in so far as "what was systematically learned a priori was not practiced in a posteriori experience and that therefore the philosopher, edifying as his considerations about the moral law might be, was the most fame-seeking writer in the world."[66] This is a

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[64] [Anonymous], 'Ueber die Ruhmsucht der Gelehrten. Aus dem Lateinischen', *Der Genius des neunzehnten Jahrhunderts* 3 (1801), no. 10, 140–168.

[65] Ibid., 162.

[66] Ibid., 150f.

phenomenon that, according to Pierre Bourdieu, can be formulated thus: that an individual "being situated" cannot but locate itself, distinguish itself, "and this irrespective of any attempt to gain distinction".[67] Indeed, many complaints seem to have a timeless character, which can be seen, for example, in complaints about distinction through darker language: "As far as many a philosopher has put some thoughts upon a dirty cloak, some have sought their fame in the darkness of their language as well."[68] The compilation of similar practices indicates that academic knowledge did not constitute itself as a space of ideas free of power, but that it featured a social dimension, which was reflected to a much greater extent by contemporaries than by modern research. A new view of the "Means to become famous in the academic world" is consequently offered by a central heuristic point of contact between the methods of knowledge and the configuration of the academic figure in the eighteenth century.

The Change of the Academic Ideal and the Ambivalences of Criticism

In a class society based on limited goods, social advancement had to be pursued within the parameters of a meritocratic order and proceed preferably without quantum jumps and conspicuousness. Hence, Christoph August Heumann, in his "*Political Philosopher*", for example, stated that one should rather ascend "per gradus" than "per saltum" to "prevent envy, which is a noxious political monster".[69] In other words: a too high degree of fame achieved too rapidly aroused suspicion. Later authors such as Christian Fürchtegott Gellert in his poem "Fame" (1754) emphasised the ideal of an internalized fulfilment of duty, wholly liberated from the mechanisms of external appreciation.[70] However, the ideal of a moral

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[67] See Pierre Bourdieu, 'Principles of a Sociology of Cultural Works', in Salim Kemal and Ivan Gaskell (eds.), *Explanation and Value in the Arts* (New York and Cambridge 1993), 173–189: 182.

[68] [Anonymus] 1801 (note 64), 156. Hönn already counted it among the frauds of the learned in 1724 "When they diligently practice an illegible way of writing only to be counted as a learned person according to prejudice once established: the learned write bad style." Hönn 1981 (note 32), 173. For other references, see Grimm 1998 (note 37), 180f.

[69] Heumann 1972 (note 52), 249.

[70] Christian Fürchtegott Gellert, *Sämtliche Schriften* (Leipzig 1775), vol. 2, 66–68. See also Wolfram Mauser, '"Der Flor der Republik". Verdienstbewußtsein und Literatur im absolutistischen Staat', in Wolfgang Frühwald et al. (eds.), *Zwischen Aufklärung und Restauration. Sozialer Wandel in der deutschen Literatur (1700–1848). Festschrift für Wolfgang Martens* (Tübingen 1989), 65–83.

code even for academics consisted of a "healthy" balance. The range of inverted patterns of habitus is thus marked by the extreme positions of the pedant and the gallant academic.[71] Neither maintains moderation, the one on account of getting lost inside his science and thus losing his sense of social reality, the other because he focuses too much on pleasing the world and thereby neglects erudition. The wordings of both poles of habitus can be found from the seventeenth century onwards up to Kant. In 1800, the latter wrote in his *Logic*: "In regard to the sciences, there are two degenerate forms of prevailing taste: pedantry and gallantry. The one pursues the sciences only for the academy and thereby restricts them in respect of their use; the other pursues them merely for contact or for the world and in this way restricts them in respect of their content."[72]

Classifying the field of practices criticized, one can discern those which are in principle common to everyone, but can be exaggerated, such as annotation or advertisement, those which tend to be litigable, such as plagiarism, and those which are above all morally questionable, such as dispute or self-praise.

Despite a moral-economic containment of status-benefits and processes of ascension, however, the lexical field, through discourse on adequate academic conduct, could also be used as a symbolic threat to one's honour. Being labelled an academic charlatan, for example, could easily turn into an extremely harmful reflection on an individual's academic reputation. The example of Leipzig-based Johann Heinrich Zedler proved that an equivalent category was suitable for this purpose to exclude disagreeable methods and subjects from the scientific field. Zedler became the victim of insinuation when he was attacked in the *Charlatanism of Bookselling* [Charlatanerie der Buchhandlung] due to his encyclopedia project, which, seen through the eyes of his contemporaries, was obviously judged as overambitious.[73] The *Charlatanism of Bookselling* consists mainly of a dialogue between the fictitious characters Calcogathus (The Well-Constructed) and Polyempirus (The Much-Experienced), who critically discuss the general methods of bookselling, such as reproduction or subscription, or the "perishable skirt regiment" in publishing, but especially the Zedler

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[71] Füssel 2006 (note 2), 378–387; Grimm 1998 (note 37), 183–193.

[72] Immanuel Kant, *Lectures on Logic* [1800], translated and ed. by J. Michael Young (Cambridge 1992), 555.

[73] *Charlatanerie der Buchhandlung, welche den Verfall derselben durch Pfuschereyen, praenumerationes, auctiones, Nachdrucken, Trödeleyen u.a.m. befördert von zwey der Handlung Beflissenen unpartheyisch untersuchet* (reprint of second edn. Sachsenhausen 1732, Leipzig 1987).

lexicon project. Among the "doers of projects", who betray their audience with their "Praenumerationes", Zedler appears as a notable mountebank. His newest project, the *Universal Lexicon*, now appears to Polyempirus "useless as well as impossible". His misogynic rhetoric already mocks at the title of Zedler's work: "The title looks splendid; if only it did not have the character of a seductive woman who covers her wrinkles and unlovely being with make-up and other arts, but who is full of a tangled mass of venereal filth inside". Above all the statement "Thoroughly collected in alphabetical order by the diligence of the most academic men of our time" arouses endless derision. Why, Polyempirus thus asks himself, would the most academic men, for example, be in need of concealing their names behind the article? But it was especially the scope of the work to be expected that aroused the scepticism of both mockers. Given the orientation of the first volume, there would have to be at least 40 volumes; indeed it would probably "last some twenty years after all. And what disastrousness would such an extensive work be subjected to in so many years!" In the end, it actually came to 64 volumes in 23 years. The complex development of the "Zedler-Project" and its critics cannot be pursued further here.[74] It serves rather as a singular but especially prominent indication of ambivalence in the increasing complexity of the enlightened culture of knowledge and, along with this, the precarious career status of one engaged in the enterprise of knowledge.

Between Morals, Economisation and Juridification

But what were these innumerable breaches of conduct among scholars based on, and where did contemporaries perceive their inner rationality? Offences against decorum could only be registered as individual moral lapses; structural patterns of explanation were hardly available. Concepts such as "thirst for fame" and exaggerated "ambition" refer to tendencies of individual-psychological pathologisation as well as to a moral code of misconduct. Structurally oriented explanations were at most partially attempted by making analogies. Thus economic metaphors in

[74] Ulrich Johannes Schneider, 'Zedlers Universal-Lexicon und die Gelehrtenkultur des 18. Jahrhunderts', in Detlef Döring and Hanspeter Marti (eds.), *Die Universität Leipzig und ihr gelehrtes Umfeld 1680–1780* (Basel 2004), 195–213; Gerd Quedenbaum, *Der Verleger und Buchhändler Johann Heinrich Zedler 1706–1751. Ein Buchunternehmer in den Zwängen seiner Zeit; ein Beitrag zur Geschichte des deutschen Buchhandels im 18. Jahrhundert* (Hildesheim and New York 1977).

the discourse of knowledge, for example, increased in quantity from the seventeenth century.[75] As, for example, when the economist Justi satirically compares the Republic of Letters to a mercantilist economy and thereby points out the structural homologies between both fields and accordingly the logic of accumulation and distribution of academic resources.[76] With regard to "academic currency" Justi announces, for example, that the "Republic of Letters mints a type of coin called fame", and "a merchant who possesses much of suchlike coins is thus called a famous man." When academics praise one another in their writings, this is comparable to issuing a coin for the other; every academic citizen had the right of coinage, but he could only enrich himself with the coins of others." Of course there are charlatans as well, who coin bad money as well as a cheap pennies entitled "Admiration" etc. Yet, Justi's astute satire of the logic of symbolic resources is an exception; the typical approach selected by almost every publication regarding questions of academic moral law is rather the collection of examples. Each of the texts presented here used broad collections of examples in the tradition of the Historia literaria across the centuries and completed them with appropriate literary references.[77] Within the individual domains of examples, additions of new "cases" could then be undertaken without restraint, as Büschel did based on the charlatanism-writing of Mencke.

Even though the concept of academic education as a channel of social mobility has meanwhile undergone remarkable relativisation at the hands of social historians, the self-differentiating literary and scientific market indeed offered considerable opportunities for the establishment of an academic existence and new social roles such as the writer or the non-academic-corporative scholar. While the university academic was subject to this exact principle according to control from above, the professions now being developed were considerably more difficult to control. The book market in particular provides some impressive examples of the difficulties of implementing a generally binding judicial norm in

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[75] See the chapter 'Selling knowledge: The Market and the Press' in Peter Burke, *The Social History of Knowledge* (Cambridge 2000), 149–176. With regard to universities, see Marian Füssel, 'Akademische Aufklärung. Die Universitäten des 18. Jahrhunderts im Spannungsfeld von funktionaler Differenzierung, Ökonomie und Habitus', in Wolfgang Hardtwig (ed.), *Die Aufklärung und ihre Weltwirkung* (Göttingen 2010), 47–73.

[76] Johann Heinrich Gottlob von Justi, 'Die Beschaffenheit und Verfassung der Republik der Gelehrten', in id. 1760 (note 57), II: 341–374.

[77] For an overview of Historia literaria, see Frank Grunert and Friedrich Vollhardt (eds.), *Historia literaria. Neuordnungen des Wissens im 17. und 18. Jahrhundert* (Berlin 2007).

the fragmented territorial landscape of the Holy Roman Empire. In an especially striking way, this is articulated in the difficulties of plagiarism and the illegal reprint, since the establishment of a binding copyright was still a long way off.[78]

Conclusions

In certain ways the discourses of a moral economy presented here reacted to problems of differentiation in the systems of the media and the sciences. Where legally binding regulations were absent, moral imperatives had to help in the informal sanctioning of scholarly pretensions of status.[79] But discussions about learned decorum cannot be interpreted as the labour pains of the knowledge society alone; they also point towards structures in the field of learning continuing to the present day. The struggle for recognition and the increase of symbolic capital are not restricted to the eighteenth century, but during this time they witnessed a moment of fundamental change in direction. Practices meant to increase one's prestige have increasingly shunned the symbolic mechanisms of corporate orders of rank, title or clothing and aimed at an unambiguous manifestation of social relations. Achieving social mobility via learning and authorship was not new but was now accomplished against the background of the eroding social boundaries of ordered society. Honour could no longer be openly put forward as a legitimate motive for scientific or learned practices, but nevertheless still played a key role.[80] "Academic Charisma", to quote William Clark, was no longer solely to be acquired in the face-to-face societies of the universities but also by publishing in a market of growing complexity. By focusing on a moral-economic constellation, we do not introduce a new form of externalism that reduces scholarly existence to quarrels about social status alone. At the same time we should be warned not to focus on an internalist reduction of intellectual content free of the ballast

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[78] See Elmar Wadle, *Geistiges Eigentum* (Weinheim 1996 and München 2003), 2 vols.

[79] Thus it is characteristic when Hönn 1724 can only account for the means to counteract the fraud of the learned: "Such frauds / which are impossible to resolve entirely [!] / may to some extent be prevented by harsh censorship and revelation of these kinds of deceptions/ as Mr. Counsel Mencke has done in his curious treatise / even translated from Latin into German: de Charlataneria Eruditorum, 'Carnival-barker of the Learned', or Mich. Lilienthal de Machiavellismo litterario and others have done most notably." Hönn 1981 (note 32), 173f.

[80] See Justin Stagl, 'Die Ehre des Wissenschaftlers', in Ludgera Vogt and Arnold Zingerle (eds.), *Ehre. Archaische Momente in der Moderne* (Frankfurt/M. 1994), 35–56.

of social history.[81] Instead, the moral economy of knowledge elevates both perspectives in favour of historicizing the cultural conditions that give repute to scholarly knowledge. It thus becomes an appropriate context for observing changing evaluations of and attitudes about the practices of knowledge as well as the figure of the savant in the eighteenth century.

[81] On this terminological dispute, see Steven Shapin, 'Discipline and Bounding: The History and Sociology of Science as Seen through the Externalism-Internalism Debate', *History of Science* 30 (1992), 333–369.

COMPILER INTO GENIUS. THE TRANSFORMATION OF DICTIONARY WRITERS IN EIGHTEENTH-CENTURY FRANCE AND ENGLAND

Caspar Hirschi*

> Dictionary-writers, at least such as meddle with arts and sciences, seem exempted from the common laws of Meum and Tuum; they do not pretend to set up on their own bottom, nor to treat you at their own cost.
>
> —Ephraim Chambers, 'Plagiary', in Cyclopædia (1728)

> It is enriched with several useful discoveries and ingenious reflections. It is by happy geniuses who cannot treat even the best-known subjects without leaving, so to speak, their imprint on them and presenting them under an entirely new aspect.
>
> —[Anonymous], Review of the Encyclopédie's second volume, in Journal des Sçavans (1754)

Theme and Theses

In 1757 the French essayist and playwright Charles Palissot, a man who loved Voltaire and loathed Diderot, published a collection of *Little Letters on the Great Philosophes*. Its first epistle was a well-timed attack on the editors of the *Encyclopédie*. Diderot and d'Alembert, having published seven volumes in seven years to loud plaudits and even louder polemics, were about to come under increased pressure; Damiens' attempt to assassinate Louis XV at the beginning of the year had caused a tightening of censorship, and the *Encyclopédie*, plagued by old and new accusations, soon faced the threat of an official ban. Palissot's criticism, by contrast with that of other opponents of the *Encyclopédie*, was driven neither by concerns about political stability nor by the wish to defend Christianity.

* The translations in this article are by the author unless otherwise indicated. Unfortunately, due to the limited space available, it was not possible to quote the original text in the footnotes. For the same reason, secondary literature is only indicated when it directly provides facts or arguments to support the author's reasoning. The author would like to thank Harvey Chisick and Andreas Hauser for helpful criticism and valuable suggestions.

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He was *anti-philosophes*, not *anti-lumières*, and was especially appalled by the public esteem the encyclopédistes enjoyed.

At the beginning of the first letter Palissot complained that the authors of the *Encyclopédie* "announced the truth or what they have taken for truth with a pomp it never had before;" they adopted "a tone of authority and decision that has, until today, only belonged to the pulpit" and they introduced "a language to moral treatises and metaphysical speculations which has been condemned everywhere else as fanaticism."[1] The letter went on with the reproach that the philosophes combined their pretentiousness with servile copying from the work of Francis Bacon, and after further accusations of hypocrisy and unoriginality, Palissot concluded with the statement: "I reserve for myself the freedom to think that a dictionary, as good as it might be, has never been a work of genius."[2]

This was not the only occasion that Palissot refused to accept that lexicographers could pass for original thinkers. In the second of the *Petites Lettres*, which dealt with Diderot's play *Le Fils naturel*, he extended the argument saying that he could hardly believe in new discoveries "in a century where people who call themselves men of genius are occupied with nothing but a dictionary."[3] And in his satirical play *Les philosophes*, which, to the great annoyance of Diderot, Rousseau and others, scored an instant success at the Comédie Française in 1760, "encyclopédie" rhymed with "génie".[4]

In the end, of course, Palissot found himself on the losing side; generations of literary historians portrayed him at best as an involuntary muse of Diderot's masterpiece *Le Neveu de Rameau* and at worst as a mediocre enemy of progress consumed by envy of his more gifted contemporaries.[5] Yet knowledge of the end of the story can hamper our understanding of its unfolding and even lead to anachronistic conclusions. If one looks at Palissot's criticism of the philosophes not from the perspective of the decades following the publication of the *Encyclopédie* but from the decades preceding it, one has to admit that he had a point. In their role as dictionary writers, Diderot and d'Alembert did indeed enjoy the reputation of literary geniuses—even among some of their enemies. Furthermore, they had built this reputation to a great extent through elaborate and eye-catching

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1 Charles Palissot, *Petites Lettres sur de grands philosophes* (Paris 1757), 2.
2 Ibid., 15.
3 Ibid., 23.
4 Ibid., 27.
5 Hilde H. Freud, *Palissot and Les Philosophes* (Geneva 1967), 23–31.

self-promotion in the first volumes of the *Encyclopédie*.[6] And finally, by this achievement, they had completed a rapid transformation of the public image of the lexicographer: a figure long treated as a modest compiler could now be considered an original author and scholarly hero.

Palissot, therefore, as a figure of classicist tastes who venerated the age of Louis XIV, had some reason to express his bewilderment about the scholarly status of the encyclopédistes. What he was unable to understand, though, was how this transformation had taken place, and what he did not see at all was that dictionaries, despite the questionable standing of their authors, became a highly important instrument of knowledge organisation in the eighteenth century.

The rise of dictionary writers in public esteem was not a phenomenon confined to French-speaking Europe. It occurred elsewhere, too, most notably in Britain, where it culminated simultaneously with Samuel Johnson's *Dictionary of the English Language*. Johnson, too, was hailed as "a genius of the highest ranks" on the basis of his lexicography.[7] Although Johnson fashioned himself very differently from the French encyclopédistes and although the ascendancy of earlier English lexicographers had taken place under dissimilar conditions than the careers of their French counterparts, developments in Britain and France were closely intertwined, with many articles and even a few whole dictionaries being translated from one language to another. Moreover, dictionary production in England and France was often propelled by nationalistic rivalry. English lexicographers looked to French models, and over time the French returned the compliment. Neither was as interested in the works of any other country. This certainly had to do with state politics, namely the long-term struggle between the two leading European powers for imperial hegemony. Yet there was another reason, less political and more cultural: a complementary relationship between the dictionaries produced in the two languages. While the French from the late seventeenth century onwards had the edge in language and historical dictionaries,[8] the English could soon claim the

[6] For my understanding of self-promotion, see Caspar Hirschi, 'Magistrate der Öffentlichkeit: Politische Selbstdarstellung aufklärerischer Gelehrter im Gewand antiker Autoren', in Johannes Helmrath and Stefan Schlelein (eds.), *Macht Antike Politik? Politische Antiketransformationen in der Europäischen Geschichte* (forthcoming).

[7] James Boswell, *The Life of Samuel Johnson, LL.D* (London 1791), 2 vols., I: 163.

[8] As to French language dictionaries, the most noticed and widespread were Pierre Richelet, *Dictionnaire françois* (Genève 1679/80 . . . 1693, 1710, Paris 1719, Lyon 1706, 1728, Bâle 1735); Antoine Furetière, *Dictionnaire universel* (The Hague and Rotterdam 1690, 1694, 1701, 1702, Rotterdam 1708, The Hague 1725, 1727); *Le Dictionnaire de l'Académie françoise*

upper hand in scientific dictionaries.[9] Paradoxically, Johnson's *Dictionary* and the *Encyclopédie*—the national monuments of English and French dictionaries per se—are also those most strongly influenced by foreign models.

Looking at both countries together offers an opportunity to examine the impact of contrasting systems of censorship, copyright and commerce on the self-promotion of eighteenth-century scholars occupied with similar large-scale publishing enterprises. Scholarly identities in the Age of Enlightenment, despite the intensity of international exchange between men of letters in general and between lexicographers in particular, were significantly shaped by the political cultures of their individual states. The role of compiler in late seventeenth-century France could have remarkably different implications than the same role in Britain at the same time, and so it was with the role of the original author or genius a few decades later.

This essay is guided by the following theses: firstly, the transformation of leading lexicographers into geniuses was a momentary phenomenon arising from an imbalance within the rapidly changing "economy" of knowledge production. While the acceleration of knowledge creation in the seventeenth century was concurrent with an increased veneration of scientific inventors and discoverers, the subsequent intensification of knowledge administration and popularisation did not inspire an equal re-evaluation of commentators, regulators and demonstrators of learning; on the contrary, those specialising in valuing, storing, interlinking and popularising knowledge were downgraded to servants of original thinkers or, even worse, to useless pedants. One reason for this was that originality and usefulness became more closely tied. For lexicographers, seeking the role of innovators was an attempt to overcome the chronic status problems related to the authorship of their widely used works, but it was not a durable solution because it did not properly reflect their scholarly functions and positions. Apart from a few success stories, most dictionary writers in the second half of the eighteenth century remained badly paid

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(Paris 1694, 1718, 1740, 1762); *Dictionnaire universel françois et latin*, later known as *Dictionnaire de Trévoux* (Paris 1704, 1721, 1732, 1734, 1740, 1743, 1758, 1771). The two most prevalent and repeatedly translated French historical dictionaries were Louis Moréri, *Le grand dictionaire historique* (Lyon 1674 in 1 vol., 1681 in 2 vols. . . . Paris 1759 in 10 vols.), translated into English as *Great Historical, Geographical and Poetical Dictionary* (London 1694), and Pierre Bayle, *Dictionaire historique et critique* (Rotterdam 1697, 1702, 1720, Amsterdam 1730, 1740, Genève 1715, Paris 1734, Bâle 1738), translated into English and considerably extended as *Historical and Critical Dictionary* (London 1710).

[9] John Harris, *Lexicon Technicum* (London 1704, 1708, 1710, 1716, 1725, 1736, 1744) and, most notably, Ephraim Chambers, *Cyclopædia* (London 1728, 1738, 1739, 1741/43, Dublin 1740).

hacks trying to portray themselves, if they had the chance at all, as genuine innovators.[10]

Secondly, eighteenth-century encyclopaedias have more in common with late seventeenth-century language dictionaries than with earlier encyclopaedic works, and so have eighteenth-century encyclopaedists with late seventeenth-century lexicographers.[11] Throughout this period, the boundaries between encyclopaedias and language dictionaries remained blurred, not least because many of their authors had no intention of drawing a clear line.[12] Antoine Furetière announced his *Dictionnaire universel* in 1684 as an "Encyclopaedia of the French language". The figure of the enlightened encyclopaedist, who opposed the culture of absolutism, advocated an egalitarian ideal of learning and expressed his belief in progress, was presaged in the Jesuit *Dictionnaire de Trévoux* of 1704, a French-Latin language dictionary. And for writers of universal scientific dictionaries, playing down the differences between language dictionary-making and their own trade facilitated an "ennobling" comparison of their works with the dictionary of the *Académie française*.

Thirdly, dictionaries owed their reputation much more to self-promotion by their authors than other books, because they were mostly selectively read and hardly ever completely evaluated. A lexicographer, to present himself in a favourable light, had to make use of the texts framing the main part of the book, which was the alphabetical presentation and explanation of a vocabulary. Most crucial for this purpose were *Dedications*, *Prefaces*, *Introductions*, *Preliminary Discourses* and *Advertisements*; they allowed authors to speak about themselves and to display their originality. Of similar importance, at least for some dictionaries, were *Plans* published in advance to announce the project and seek subscriptions, *Subscription lists* inserted at the beginning or end of the dictionary and, not least, *Title pages* and *Frontispieces*. In this respect it would be only a slight exaggeration to say that for the public image of a dictionary, its paratexts constituted the main text.

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[10] Robert Darnton, *The Business of Enlightenment: A Publishing History of the Encyclopédie, 1775–1800* (Harvard 1979).

[11] There generally seems to be little clarity on what passes for an "encyclopaedia" in the medieval and early modern periods, with the consequence of very wide and varied use of the term; see Peter Binkley (ed.), *Pre-modern Encyclopaedic Texts* (Leiden 1997); Robert Collison, *Encyclopaedias: Their History throughout the Ages* (New York and London 1964), 44–113.

[12] Carey McIntosh, 'Eighteenth-Century English Dictionaries and the Enlightenment', *The Yearbook of English Studies* 28 (1998), 3–18: 8.

And fourthly, Johnson and the encyclopédistes, in the paratexts of their dictionaries, successfully tried to eliminate their predecessors from public memory in order to consolidate their claims of originality. Modern historians, too, have been under the spell of this strategy, devoting their attention to these two works, while largely neglecting the dictionaries published before 1750. Only a few have resisted the trend.[13] As soon as one takes the preceding works into account, the lexicography of Johnson, Diderot and d'Alembert looks considerably less bold, whereas their self-promotion looks even bolder.

In modern times, the *Encyclopédie* and Johnson's *Dictionary* have come to embody much more than just intellectual genius. They even star in foundation myths of modern authorship, standing for the autonomy of intellectuals vis à vis both state and church (*Encyclopédie*), or for writers' liberation from patronage (*Dictionary*). Johnson's *Letter to Lord Chesterfield*, written in 1755 to reject the nobleman's planned patronage of his work, has been labelled "literature's declaration of independence"[14] and "the Magna Carta of the modern author."[15] One has to engage in some serious misreading to come to such conclusions, and a vivid imagination is required as well to proclaim the birth of modern authorship from the spirit of lexicography. However, such narratives are attractive because they insinuate a transition from intellectual impurity to purity, from epistemic chaos to order, accomplished by single literary monuments. They prove especially powerful in an age like ours, when established literary genres, scholarly roles and concepts of authorship seem to be swept away by the Internet. Drawing a more nuanced picture of the "siècle de l'Encyclopédie" might therefore help to get a better understanding of the "Age of Wikipedia", too.

In what follows we shall first consider a comparative outline of the changing circumstances under which dictionary writers in France and England operated. Based on *universal* dictionaries published between 1690 and 1760, we will then turn to the different strategies they used to modify their profiles. Among these strategies are the creation of a venerable

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[13] The broadest overview of English and French dictionary writing predating the *Encyclopédie* and Johnson's *Dictionary* can be found in Frank A. Kafker (ed.), *Notable Encyclopaedias of the Seventeenth and Eighteenth Centuries: Nine Predecessors of the Encyclopédie* (Oxford 1981), and the current state of research is represented by Richard Yeo's excellent study *Encyclopaedic Visions: Scientific Dictionaries and Enlightenment Culture* (Cambridge 2001).

[14] William Joseph Long, *Outlines of English and American Literature* (Boston 1917), 165.

[15] Alvin Kernan, *Samuel Johnson and the Impact of Print* (Princeton 1987), 105.

genealogy of dictionary writers, the imagery of territorial expansion portraying the lexicographer as a participant in a civilising conquest, the portrayal of dictionary writers as critical commentators and as agents of enlightenment, and finally, the emphasis on lexicography as self-sacrifice for the republic of letters, the nation or humankind, rewarding the author with nothing but sickness, sorrow or persecution.

The Cult of Originality and Its Victims

In the early modern period writing and editing a dictionary was generally seen as the typical work of a compiler. According to the definition given by Antoine Furetière in 1690, a compiler was "an author who has collected and gathered several works to present them to the public, or who has collected everything that others have said on certain matters."[16] The second meaning corresponded to the traditional role of a lexicographer, who was expected to reproduce the complete vocabulary of either a field of knowledge or a language, to collect all relevant data produced by other authors, and to attribute it to the right terms. There was hardly any originality applied to the task, but this does not mean that it was disparaged. Until the mid-seventeenth-century "compiler" usually was neither a word of praise nor of shame; it was rather a neutral designation of a man of letters engaged in a certain type of scholarship in which one could both excel and fail. This use was still echoed in the example given in Pierre Richelet's *Dictionnaire françois* of 1680: "Du Chêne, who has given us five volumes of French history, is a famous compiler."[17]

The widespread acceptance of the compiler as an indispensable figure corresponded to the learned culture of humanist classicism that had dominated large parts of European scholarship since the sixteenth century. By collecting and assembling material from old texts, a compiler acted as a curator and circulator of old learning, which enjoyed greater epistemic regard than recently produced knowledge, especially when attributed to classical authors. A typical literary genre of early modern compilation was the commonplace book, composed either for personal or public use, amongst others by no lesser authors than Jean Bodin and Francis Bacon.[18]

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[16] Furetière 1690 (note 8), unpaginated.

[17] Richelet 1679/80 (note 8), 156.

[18] Ann Blair, 'Humanist Methods in Natural Philosophy: The Commonplace Book', *Journal of the History of Ideas* 53 (1992), 541–551. The commonplace book has also been

Within humanist culture, the role complementing that of the compiler was the commentator, defined by Furetière as someone "who writes to explain an old or obscure book, or to make some additions or supplements to what is missing there."[19] A commentator was not expected to be inventive either; quite the opposite, his task of reconstructing the original text and meaning of a literary work was meant to be guided by bookish scholarship and textual evidence. Both figures, compiler and commentator, were inclined to understate their originality. In the name of knowledge preservation, they accomplished innovations by rearrangement (compiler) and by reconstruction (commentator). Such understatement was functionally well suited to a learned culture controlled by official censorship.

Before the second half of the seventeenth century inventions and discoveries were practices mainly attributed to mechanical arts such as typography, gun-making or architecture. Already sixteenth-century humanists, who were proud of the technical innovations of their fellow countrymen, ascribed the mental qualities of *ingenium* and *subtilitas* to outstanding craftsmen and artists.[20] At the same time, they were anxious to keep mechanical and liberal arts discrete and therefore constructed their own roles on different grounds. However, the classicist self-promotion of humanist scholars turned into a disadvantage when princely courts intensified their demand for artistic and scientific innovation and when the increased production of new knowledge gave way to an unprecedented belief in progress. By the end of the seventeenth century, French or English scholars enjoying the reputation of compilers had nothing much to laugh about. Meanwhile, learned commentators fared a little better, because their philological criticism of classical texts could be regarded as a practice preliminary to the "universal" criticism introduced and exercised by enlightened thinkers.[21]

The case for the worthlessness of compilers was forcefully advocated by Jean de la Bruyère in his widely read *Caractères*. In the English translation of 1713, the first of his essays, *On the Manners of the Present Age*, was

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presented as a precursor to enlightened encyclopaedias; see Richard Yeo, 'Ephraim Chambers's *Cyclopædia* (1728) and the Tradition of Commonplaces', *Journal of the History of Ideas* 57 (1996), 157–175.

[19] Furetière 1690 (note 8), unpaginated.

[20] Caspar Hirschi, *Wettkampf der Nationen: Konstruktionen einer deutschen Ehrgemeinschaft an der Wende vom Mittelalter zur Neuzeit* (Göttingen 2005), 283.

[21] This "genealogy" is still advocated by Voltaire, 'gens de lettres', in Denis Diderot and Jean le Rond d'Alembert (eds.), *Encyclopédie, ou Dictionnaire Raisonné des Sciences, des Arts et des Métiers* (Paris, Neuchâtel and Amsterdam 1751–1772), 28 vols., VII: 599–600: 599.

entitled *Of Polite Learning*. After praising those "Artists or able Men", who "by their Genius and Invention . . . frequently break thro the Rule of Art to ennoble it, and thwart the common Roads, if they don't conduct them to what is great and extraordinary", La Bruyère launched an attack on those "inferior or subaltern" minds, "who seem as if they were born only to collect, register and raise Magazines out of the Productions of other Genius's." He then continued:

> They are Plagiaries, Translators, or Compilers; they never think, but tell you what other Men have thought. And as the good choice of Thoughts proceeds from Invention, having none of their own, they are seldom just in their Collections, but chuse rather to make them large than excellent. They have nothing Original of their own; they know not what they learn, and learn what the rest of the World are unwilling to know; a vain and useless Science, neither agreeable nor profitable in Commerce or Conversation: Like false Mony, it has no currency; we are at once surpriz'd at their reading, and tir'd with their Company or Writing: However, the Great Ones and the Vulgar mistake 'em for Men of Learning, but the Wise rank 'em with the Pedants.[22]

Quoting this passage at length helps to bring out the radical dichotomy that is created here: "genius"—signifying either "natural talent" or "man of superior faculties"—is linked to true learning, noble art, useful science and agreeable conversation, whereas "compiler" is associated with mental inferiority, plagiarism, dullness, deceit, uselessness and pedantry. In between, la Bruyère reserved a place for commentators, albeit closer to those living the lowlife of compilers than to those "mounting high"; he judged criticism "a Trade, not a Science; it requires more Health than Understanding, more Labour than Capacity, and Habit than Genius."[23] The dichotomy between original and unoriginal thinking was all the more fundamental, as the term "genius" reduced it to a question of natural disposition.

There is a certain irony in La Bruyère's damning of compilers as his own work, according to the older interpretation of the term, rather matched the criteria of a compilation. The French first edition of 1688 consisted of a free translation of Theophrastus' *Characters* supplemented with miscellaneous remarks and a few new character portraits by the author himself. There was no passage praising geniuses and condemning compilers at that stage; it was inserted in subsequent editions between 1688 and 1692, together

[22] Jean de la Bruyère, 'Characters', in *Works of Monsieur de La Bruyere* (London 1713), 2 vols., II: 27–28.
[23] Ibid., 28.

with other bits and pieces, which eventually tripled the size of what became to form the famous second part on contemporaneous persons.[24]

The fall of compilers into disrepute was soon reflected in dictionaries, too. The article *Compilateur* in the 1701 edition of Furetière's *Dictionnaire universel*, revised by Henri Basnage, quoted La Bruyère's harsh verdict, and so did the *Dictionnaire de Trévoux*, which copied the whole article from Basnage.[25] Nathan Bailey defined *compilation* in his *Universal Etymological English Dictionary*, the most sold and—in terms of vocabulary—most complete English language dictionary of the eighteenth century, as "A Robbing or Plundering: Also a heaping up."[26] And while Samuel Johnson's definition of compiler was rather neutral, his two examples aptly reproduced the old and new meanings of the term. From Bacon's *New Atlantis* of 1627 he quoted: "Some draw experiments into titles and tables; those we call *compilers*." And to Jonathan Swift he ascribed the sentence: "Some painful *compiler*, who will study old language, may inform the world that Robert earl of Oxford was high treasurer."[27] Johnson actually shortened Swift's sentence with the effect that the term sounded significantly more negative than in the original.[28]

On the whole, when the heyday of universal dictionaries started, the standing of compilers was lower than ever before.[29] It did not take long until this imbalance raised direct questions about the value of dictionaries. In the *London Magazine* of 1736, an anonymous author ended his essay on the *Causes of the Decay of Learning* with the words:

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[24] Jean de la Bruyère, *Les caractères de Théophraste traduits du grec avec Les caractères ou les mœurs de ce siècle* (Paris 1692), 99–101.

[25] Furetière 1701 (note 8), unpaginated; *Dictionnaire universel françois et latin* 1704 and 1721 (note 8), unpaginated.

[26] Nathan Bailey, *Universal Etymological English Dictionary* (London 1723), unpaginated; from 1730 onwards Bailey's dictionary was published, in gradually expanded editions, under the title *Dictionarium Britannicum*.

[27] Samuel Johnson, 'Compiler', in *A Dictionary of the English Language* (London 1755), 2 vols., I: unpaginated.

[28] Johnson's sentence makes the compiler seem like a pedant proclaiming banalities. This was not Swift's intention. For a comparison, see Jonathan Swift, *Proposal for Correcting, Improving and Ascertaining the English Tongue* (London 1712), 41: "If things go on at this rate, all I can promise your LORDSHIP is, that about two hundred years hence some painful compiler, who will be at the trouble of studying old language, may inform the world that, in the reign of QUEEN ANNE, ROBERT EARL OF OXFORD, a very wise and excellent man, was made *High Treasurer*, and saved his country, which in those days was almost ruined by a *Foreign War* and a *Domestic Faction*."

[29] On further British authors who stressed the superiority of original over imitative composition, see Mark Rose, *Authors and Owners: The Invention of Copyright* (Cambridge 1993), 114–124.

> All Sciences are now chiefly comprised in *Dictionaries*, we want no other Keys to unlock them: There's scarce a Man of tolerable Reading, but when furnished with a good *Moreri*, thinks himself upon a Level with the learned of the first Rank, the Compilers of which were below those of the second.[30]

Here, dictionaries are directly blamed for preventing the advancement of learning. Attacks of this sort, exploiting the bad name of compilers, were a threat to both the status of lexicographers and the epistemic authority and long-term success of dictionaries. After all, universal dictionaries owed much of their public appeal to the promise of sorting the world of knowledge in a time of accelerating change and information overload: language dictionaries held out the promise of fixing speech and writing by indicating the right use of words, and scientific dictionaries claimed to reduce the glut of knowledge to digestible portions by separating the wheat from the chaff, thereby facilitating future innovations.[31] These were ambitious pledges and they had to be backed by epistemic authority in order to be credible. Authorship linked to the meagre talents and immoral manners of compilers could only offer proof of the contrary. Creating a favourable image of lexicographers was all the more important as universal dictionaries were major investments for publishers and often had to be co-funded by wealthy subscribers or patrons, who naturally had no incentive to be associated with works of dubious provenance.[32]

The Impact of Copyright and Censorship

The situation for writers and publishers of dictionaries was further complicated by the mechanism of copyright legislation in Britain and censorship in France. The two systems had quite opposite effects. British copyright legislation was first introduced by the *Act for the Encouragement of Learning* in 1710 to replace the *Licensing Act*, which had been abandoned, together with pre-publication censorship, fifteen years before.[33]

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[30] *The London Magazine, and Monthly Chronologer* 5 (1736), 84.

[31] Yeo 2001 (note 13), 141–144.

[32] On publishing dictionaries by subscription, see ibid., 46–58; on problems of epistemic authority in relation to the subscription business in general, see Adrian Johns, *The Nature of the Book. Print and Knowledge in the Making* (Chicago and London 1998), 450–453.

[33] After the end of pre-publication censorship, authors could still be legally persecuted for libel, blasphemy, sedition and treason, but actual cases of severe punishment became increasingly rare in the course of the eighteenth century and always were on a small scale in comparison to France. Edward G. Andrew, *Patrons of Enlightenment* (Toronto 2006), 28 and 54–55.

It established a legal understanding of authorship that was tied to the notion of an immutable work created by original invention. The act guaranteed the copyright owner of an unpublished work the "sole Right and Liberty of printing" for fourteen years plus another fourteen years if the author was still alive at the end of the first period; it further conferred the same exclusive rights to copyright owners of a previously published book for 21 years. Although this piece of legislation was obviously not meant to target dictionaries, it added to the pressure on lexicography.[34] Dictionary writers either reacted by defending their "own avowed practice" of copying from each other as a legal exception, or they pretended to have invented almost everything themselves, therefore meriting the name of author, not of compiler.[35] Dictionary publishers, meanwhile, who claimed a copyright on their titles, faced the uncertainty of what was meant by the licence "to Print or Reprint *the same*".[36] As a matter of fact, reprints of dictionaries were generally far from identical with the original edition, and revisions and additions were often not accomplished by the original author. Successful titles could, years after the author's death, grow from one to ten volumes and even change confessional or national alignment.[37] In such a process the author's name mutated from *originator* to *brand*. And because "improvements" and "corrections" were used as selling

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[34] Rose 1993 (note 29), 137.

[35] Chambers 1728 (note 9), vol. 1, XXIII. For a nice example of an ostentatious claim of originality, see Yeo 2001 (note 13), 212–213 and 229.

[36] *An Act for the Encouragement of Learning* (London 1710), 1 (italics by the author). Quite a few publishers did not officially register their dictionaries in the decades following 1710, because the costs were high and the actual protection was still low. See Yeo 2001 (note 13), 225–228.

[37] Moréri's *Grand dictionnaire historique* was launched by the author as a staunchly Catholic work in one volume; after his death in 1680 it was turned into a multivolume Protestant dictionary by the Dutch Calvinist Jean Le Clerc in 1691, then "reconverted" to Catholicism by a Parisian publisher in 1699. In 1701, the English translator of Le Clerc's version, Jeremy Collier, found it "necessary to melt down some part of the English History and throw it into a new Form." By 1759, the Parisian edition had grown into ten volumes. A similar fate was in store for Furetière's *Dictionnaire universel*, whose first edition was already posthumously published, then Protestantised by Henri Basnage in 1701 and re-Catholicised under the different title of *Dictionnaire de Trévoux* in 1704. And when Pierre Bayle's *Dictionaire historique et critique* was translated into English by Johnson's friend Thomas Birch between 1734–1741, he added hundreds of British biographies to the original. See Jeremy Collier, 'The Preface', in Louis Moréri, *The Great Historical, Geographical, Genealogical and Poetical Dictionary* (London 1701), unpaginated; Arnold Miller and Louis Moréri's *Grand dictionnaire historique*, in Kafker 1981 (note 13), 13–52: 18–19; Dorothea Behnke, *Furetière und Trévoux. Eine Untersuchung zum Verhältnis der beiden Wörterbuchserien* (Tübingen 1996); Anne McDermott, 'Johnson's Dictionary and the Canon: Authors and Authority', *The Yearbook of English Studies* 28 (1998), 44–65: 47.

points in the advertisements of new editions, the changes could hardly be overlooked.

Dictionary publishers therefore could not have been too surprised that their copyright was soon officially challenged. In 1737, when Ephraim Chambers prepared a recast of his successful first edition of the *Cyclopædia*, a bill was introduced in Parliament "containing a clause to oblige the publishers of all improved editions of books, to print their improvements separately." This would have been a legally satisfying, though commercially harmful solution to the copyright issue at stake. Chambers abandoned the recast, although the bill, after passing the House of Commons, was thrown out in the Lords. The second edition of 1739 only contained some alterations and additions—and a new *Advertisement* stressing how much "the booksellers were alarmed" with the proposed bill.[38] Once more, dictionary producers slipped through the legal net, but the issue remained largely unresolved.

In France, dictionary producers of the early eighteenth century had quite a different problem. As elsewhere on the continent, state licensing and official censorship remained in place. While the British copyright system encouraged self-promotion by authors as inventors and contributed to a literary culture overstating originality, a censorship system traditionally did the contrary. Censors, too, depended on an understanding of authors as originators, albeit not to reward but to punish them. As a consequence, writers had every reason to obliterate traces of original thinking and to stick to their traditional roles of compiler or commentator. Indeed, during the seventeenth century, original or heterodox thinkers often hid behind the voices of other authors. The fall of compilers into contempt therefore had a rather paradoxical effect: it became a threat to original and heterodox thinkers.

Under these circumstances, dictionary writers had basically three options. They could resist the general trend by combining the traditional roles of compiler and commentator, claiming to do a useful job of broad criticism without expecting any reward; in so doing they appeared as humble agents of progress and could even continue to play the conventional game of hide and seek with censors. This was the role taken by Pierre Bayle in his *Dictionnaire historique et critique* of 1695. The second option

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[38] Chambers 1739 (note 9), unpaginated; John Nicols and Samuel Bentley, *Literary Anecdotes of the Eighteenth Century* (London 1812), vol. 5, 659; Francis Espinasse, 'Chambers, Ephraim (1680?–1740)', in *Oxford Dictionary of National Biography*, URL: http://www.oxforddnb.com/view/article/5070 (accessed 05.08.2009).

was to renounce any personal exposure and responsibility by publishing anonymously, which offered the opportunity to fish out of other works whatever seemed suitable. This was the way chosen by the Jesuit editors of the *Dictionnaire de Trévoux* in 1704, who generously helped themselves to Henri Basnage's revision of Furetière's *Dictionnaire universel*. They went unpunished in France, but in Holland, where Basnage's publisher enjoyed a privilege on Furetière's reprints, two hundred copies of the dictionary were seized, legally condemned as counterfeits and sent back to France.[39] The third option was to make a virtue of necessity and play a high risk game by openly claiming originality, in combination with the display of willing acceptance to be persecuted. Indeed, in a capricious censorship system such as the French one, the role of genius came with a free pass to the virtue of the persecuted. This was the model adopted by Diderot and d'Alembert, and, early on, it was accepted and exploited by some critics, whose emphasis on their genius was meant to sound like an alarm bell. A long review of the *Encyclopédie's* first volume in the *Journal des Sçavans* summarised its message as follows:

> For a long time no book has come out that was as well-shaped, as philosophic, as full of wit and sagacity and that marks such superior genius. But we are obliged to warn that this work has defects and contains even dangerous things in important matters, which watchful journalists must not be silent about.[40]

Diderot and D'Alembert immediately saw the danger of such poisoned praise and tried to silence their journalist critics by repeated interventions with high state officials and by reiterated counterattacks in newly published dictionary volumes.[41] From the start, they experienced both the upsides and downsides of genius lexicographers in a censorship system, whereas their publishers, who usually profited from the Parisian monopoly created by the French licensing practice, had to accept an even greater amount of insecurity than was already present in the business of dictionary-making.[42]

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[39] On top of this, the holder and importer of the copies, the bookseller Jean Louis de Lorme, was fined 400 florins. Behnke 1996 (note 37), 129.

[40] *Journal des Sçavans* (1751), 617–627: 625.

[41] On d'Alembert's letter to d'Argenson, see Ronald Grimsley, *Jean d'Alembert (1717–83)* (Oxford 1963), 27–28; on Diderot's feud with Abbé Berthier, the editor of the *Journal de Trévoux*, see John N. Pappas, *Berthier's Journal de Trévoux and the Philosophes* (Geneva 1957), 166–196.

[42] On the long-time effects of the French licensing policy over the eighteenth century, see Raymond Birn, 'The Profits of Ideas: Privileges en Librairie in Eighteenth-Century France', *Eighteenth-Century Studies* 4 (1971), 131–168.

Caesar the Lexicographer, Samuel the Conqueror

Having outlined the cultural and structural conditions which forced eighteenth-century lexicographers to remake the traditional role of compilers, we can now turn to the self-promotion strategies they developed to underpin their epistemic authority. A rather conventional but effective approach was to create a venerable lineage of dictionary writers. Constructing a genealogy helped to raise one's profile in the company of past literary protagonists; it made one's work appear as a continuation or even culmination of a long and noble endeavour; and it could elegantly block out unwelcome competitors in the field. An early example of this was given by the most prestigious dictionary authorship possible in the late seventeenth century, the *Académie française*. In the preface of the *Dictionnaire's* first edition, published in 1694, the *Immortals* emphasised that "enlightened minds", contrary to the "vulgar", wanted to know "the different ideas on which our words form":

> This is why several great personalities became very seriously attached to the study of words. The founder of the Roman Empire, Julius Caesar, in the middle of his most important endeavours, composed two books of observations on the Latin language, entitled *Of Analogy*, which he addressed to Cicero … Charlemagne, king of France and founder of a new empire worked as well on the embellishment of his language which he reduced to certain rules and of which he composed a grammar himself.[43]

Identifying the archetype of the academy lexicographer as *imperator doctus* was a central element of a wider plan to present the *Dictionnaire* as an imperialist enterprise adding to national glory. Other elements of the plan will be detailed below; here it suffices to point out the role attributed to Charlemagne as founder of both a distinctively French Empire and lexicography. For this, the academicians merely needed to discreetly obscure the fact that the Carolingian sources, while themselves exaggerating the education of the king of the Franks, had left no doubt that "his language" was Germanic.[44] The presentation of lexicography as a noble task originally executed by emperors and permanently reserved for "persons of the first quality" helped as well to demonstrate that the French academicians played in a higher league than their contemporary competitors, Richelet and Furetière, whom the preface did not mention at all.

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[43] Preface in *Le Dictionnaire de l'Académie françoise* 1694 (note 8), I: fol. eii v–eiii r.
[44] Hirschi 2005 (note 20), 316–318.

The dictionary of the French Academy was a mixed blessing for later lexicographers; they profited from the prestige the academicians brought to dictionary writing, but they lacked the epistemic authority to fashion themselves in a similar way. What they could do was to openly challenge the *Dictionnaire* in order to elevate themselves to an equal level. Chambers, who did not shy away from such an attempt, invented an even longer genealogy of lexicographers.[45] His self-promoting was split into two rather contrasting narratives, one very humble and one quite lofty. The genealogy belonged to the latter. After supposing that the earliest dictionary writer might have been just "some little grammarian", he brought forward "a more probable" assumption, that lexicography's origins lay

> in the early days of the *Phœnician* or *Egyptian* sages, when Words were more complex and obscure than now; and mystic Symbols and Hieroglyphics obtain'd; so that an Explication of their Marks or Words, might amount to a Revelation of their whole inner Philosophy: In which Case, instead of a Grammarian, we must put perhaps a *Magus*, a *Mystes*, or *Brachman* at the head of Dictionaries.[46]

Chambers here drew on early modern neoplatonists, who were sure to have found the roots of Christian philosophy in the *prisci theologi* of ancient Egypt and Asia—reputed polymaths who excelled in all fields of study.

After his first edition had proved an instant success and he had been amply rewarded with £500 by his booksellers and a fellowship of the Royal Society, Chambers translated the profile of the original lexicographers to the present. The result, outlined in his *Considerations* for a second edition, reflected the rapid rise of a former globe maker's assistant to literary fame. A dictionary writer, according to Chambers, "must have a compass of learning more universal than was ever found in the most celebrated Polyhistors, an Eratosthenes, Varro, or Bacon; . . . have more Reading than a Leibnitz or Le Clerc; more Reflection than a Hobbs, Malebranche, or Locke" and so on. Fully identifying with this profile, Chambers proudly announced that the recast *Cyclopædia* would "furnish the best Book in the Universe; and abundantly indemnify us in the Want of what other

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[45] At the beginning of the preface, Chambers brought the same argument forward that later contributed to Johnson's fame—minus the display of nationalistic chauvinism: he claimed to have accomplished more on his own in a shorter period of time than the members of the "Academy *della Crusca*" and the "French Academy" together. Chambers 1728 (note 9), vol. 1, I; Johnson's version, as told long after his death by Boswell 1791 (note 7), I: 101.

[46] Chambers 1728 (note 9), vol. 1, XXI.

Countries are so fond of—Royal, Imperial, Caesarian, and Ducal Academies, Palatine Societies, and the like."[47]

Diderot's and d'Alembert's recourse to famous names was not less high-flown but more sophisticated. One of their main goals was to downplay Chamber's influence. The *Encyclopédie* not only started as a translation project of the *Cyclopædia*, it also carried over Chamber's most important innovation—the combination of a systematic with an alphabetical arrangement of knowledge, purportedly linked by cross-references at the bottom of most entries.[48] D'Alembert followed Chambers' model, too, when representing the system of knowledge in the form of a tree divided into branches. Instead of acknowledging these dependences, he introduced Chambers as not much more than a translator of French dictionaries, who would have only "excited the indignation of savants and the outcry of the public" were he to be translated back into French, and he maintained that "nothing is more different" from his tree of knowledge than the one by Chambers.[49] The title of the official forerunner to the *Encyclopédie* was bestowed upon "the Chancellor Bacon", and d'Alembert indeed shaped his tree along the lines of Bacon's division of learning from 1605 (fig. 1). This conveyed the impression that the encyclopédistes did not follow other lexicographers, but figures of the highest originality. How effective this strategy was can be seen in a review of the second volume by a journalist of the *Journal des Sçavans*, who this time described the editors as "happy geniuses", highlighted their "useful discoveries", praised their contribution to "the glory of the nation" and especially applauded them for integrating cross-references to the alphabetical entries—"which has not been attempted until now."[50]

Yet, drawing on a 150-year-old model in order to reproduce the present state of affairs came at a price.[51] D'Alembert's preliminary discourse ran into inconsistencies and presented a monstrous graph in comparison to which Chambers' tree of knowledge looked easily accessible (fig. 2). This

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[47] Ephraim Chambers, *Some Considerations Offered to the Publick, Preparatory to a Second Edition of Cyclopædia* (s.l., s.a.), 3; Robert DeMaria Jr., *Johnson's Dictionary and the Language of Learning* (Oxford 1986), 5–6.

[48] Yeo 2001 (note 13), 211.

[49] Jean Le Rond d'Alembert, 'Discours préliminaire', in Diderot and d'Alembert 1751–1772 (note 21), I: i–xlv: xxxv; id., 'Observations sur la division des sciences du Chancelier Bacon', ibid., li–liv: li.

[50] *Journal des Sçavans* (1754), 84–91: 85.

[51] Robert Darnton, 'Philosophers Trim the Tree of Knowledge: The Epistemological Strategy of the *Encyclopédie*', in id., *The Great Cat Massacre and other Episodes in French Cultural History* (New York 1985), 191–213: 201.

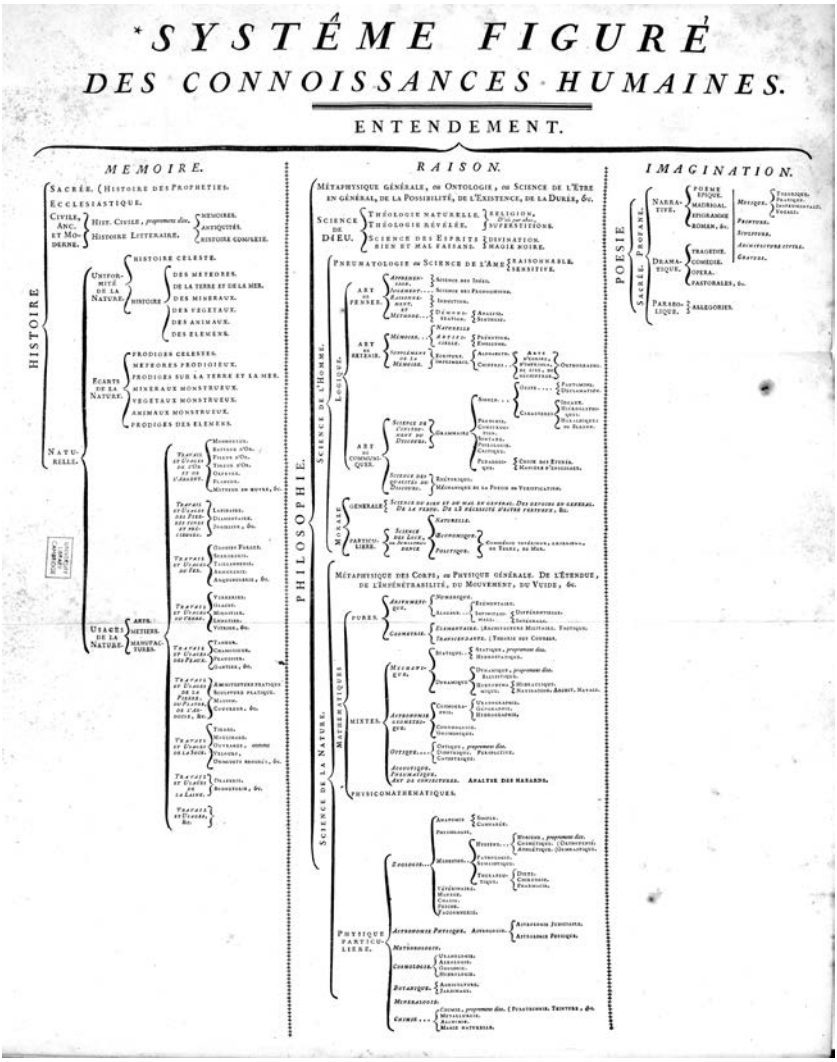

Fig. 1. "Système figuré des connoissances humaines", from: Denis Diderot and Jean le Rond d'Alembert (eds.), *Encyclopédie, ou Dictionnaire Raisonné des Sciences, des Arts et des Métiers*, vol. 1 (Paris 1751).

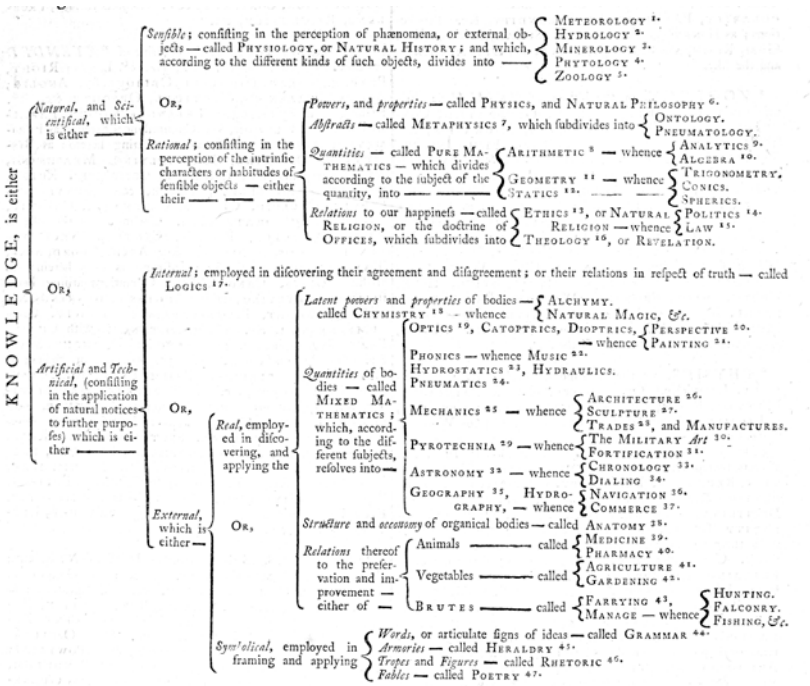

Fig. 2. Tree of knowledge, from: Ephraim Chambers, *Cyclopædia* (London 1728).

did not escape the editors' notice, and Diderot, in the entry *Encyclopédie* a few years later, felt obliged to answer the question of why Chambers' encyclopaedic order was "so perfect and regular." Topping d'Alembert's condescending attitude he explained, without even mentioning Chambers' name, that the "English author" had "invented nothing" and was only a "labourer who ploughed his furrow, shallow, but even and straight."[52]

In terms of adorning themselves with great names, Diderot and d'Alembert introduced a new dimension. They picked their personnel not only from the past, but also from the present. What enabled them to do so was their attempt to overcome the problem of epistemic authority by designing the *Encyclopédie* as a work written by a "society" of highly ranked expert contributors. Diderot showcased Voltaire as one of the

52 Further down, Diderot did call Chambers by name—as an example of "a bad author"; Denis Diderot, 'Encyclopédie', in Diderot and d'Alembert 1751–1772 (note 21), V: 635–648A: 641A.

"men of letters of the highest reputation" who "have deigned to send us pieces of their work."[53] D'Alembert proudly announced Buffon as author of the article *Nature* on the first page of the second volume, albeit somewhat prematurely, as the famous naturalist would never contribute to the *Encyclopédie*. And he composed a lengthy eulogy—a practice typical of academies—to Montesquieu in volume five, stressing his close alignment to the *Encyclopédie* and his suffering from similar attacks by "these authors without talent."[54]

Palissot, who had composed an *Eloge* of Montesquieu himself, was furious to see the great man posthumously lined up with the *philosophes* without having left behind anything for the *Encyclopédie* but a short draft of the article *Taste* [Gout].[55] His attempt to expose d'Alembert's praise of Montesquieu as an act of usurpation touched on a crucial aspect of the image campaign by the encyclopédistes, but missed its full impact. In order to present the dictionary as a collaborative work by the leading exponents of different fields, the editors hid much of the actual authorship from the public. Most contributors, among them many unknown clerics and hacks, remained anonymous and the bulk of the work was finally done by a handful of scholarly all-rounders. In other words: the authorship represented in the *Encyclopédie* was very different from the people who wrote it. A long-term effect of this successful branding by Diderot and d'Alembert is that even today, and despite various detective efforts by modern historians, the authors of about two-fifths of the articles in the *Encyclopédie* are still unknown.[56]

To imagine lexicographers participating in a conquest must have given a more dynamic impression than to visualise them merely as the heads of a venerable genealogy. Here, too, the *Académie française* set the tone.[57] In the dedication to Louis XIV, the academicians introduced their work as a cultural complement to the king's military campaigns. The French language, they argued, had been dominating Europe thanks to the king's superior power. "While we apply ourselves to embellish it, your victori-

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[53] Ibid., 645.

[54] Jean le Rond d'Alembert, 'Eloge de M. le Président de Montesquieu', in Diderot and d'Alembert 1751–1772 (note 21), V: iii–xxviii: xiv.

[55] Palissot 1757 (note 1), 7–10.

[56] Darnton 1979 (note 10), 512.

[57] Of course, the academicians had predecessors in this regard, too, the most notable an outcast from their own body: Furetière, in the dedication of his *Essai d'un Dictionnaire Universel* (Paris 1684), fol. ai v–aii r, already linked his *Encyclopédie de la langue françoise* to the Sun King's conquests, although without specifying the relation between the two.

ous arms pass it on to the foreigners; we facilitate their understanding of it by our work, and you make it necessary by your conquests."[58] The academicians portrayed themselves as a *functional elite* providing the king an expert service to consolidate his military expansion.[59] And they presented the *Dictionnaire* as a literary enterprise suited to the monarch's hegemonic aspirations.

Later lexicographers took up the motif of territorial expansion—and turned it into a metaphor. Chambers, in his dedication to George II, declared the *Cyclopædia* "an Attempt towards a Survey of the Republick of Learning, as it stands at the Beginning of Your Majesty's auspicious Reign." He then continued:

> We have here the Boundary that . . . separates the known, from the unknown Parts of the Intelligible World. Under Your Majesty's Princely Influence and Encouragement, we promise our selves this Boundary will be removed, and the Prospect extended far into the other Hemisphere.—Methinks I see Trophies erecting to Your Majesty in the yet undiscover'd Regions of Science; and Your Majesty's Name inscribed to inventions at present held impossible![60]

During the period when Britain rose to become the world's dominant colonial power, Chambers described the changes in science as a conquest on a *global* level. However, although he stressed its dependence on royal patronage and its service to royal glory, he did not link the expansion of science to the expansion of the British state. The image of conquest now expressed the universal progress of learning, and the encyclopaedia represented a map of the current state of universal knowledge. Chambers himself, in the dedication to the king, did not appear as a conqueror, but as a civiliser behind the frontlines of scientific discovery, establishing the territorial unity of learning and thereby enabling new expeditions into unknown territory.

A further step was taken by Samuel Johnson, who did not settle for the title of describer of a conquered territory. He preferred the role of conqueror. In his *Plan of an English Dictionary* addressed to Lord Chesterfield in 1747, he described the challenge ahead of him:

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[58] Epistre, in *Dictionnaire de l'Académie française* 1694 (note 8), I: fol. aiii r.

[59] For my understanding of the term *functional elite*, see Caspar Hirschi, 'Die Erneuerungskraft des Anachronismus: Zur Bedeutung des Renaissance-Humanismus für die Geschichte politischer Öffentlichkeiten', in Martin Kintzinger and Bernd Schneidmüller (eds.), *Politische Öffentlichkeit im Spätmittelalter* (forthcoming).

[60] Chambers 1728 (note 9), vol. 1, unpaginated.

> When I survey the Plan which I have laid before you, I cannot, my Lord, but confess, that I am frighted at its extent, and, like the soldiers of Cæsar, look on Britain as a new world, which it is almost madness to invade. But I hope, that though I should not complete the conquest, I shall, at least, discover the coast, civilize part of the inhabitants, and make it easy for some other adventurer to proceed farther, to reduce them wholly to subjection, and settle them under laws.[61]

Subjecting and civilising complete barbarians was a rather bold image for a project in a field of work already treated by more than a dozen lexicographers, but it went nicely with the later myth that Johnson had composed the "first English dictionary." Johnson did not go as far as to claim Caesar's place explicitly, but as he planned his lexicographic conquest as a single author, his comparison implicitly amounted to him standing for the general and the army together. Johnson still framed his *Plan* as a letter to his—then wished-for—patron, but already at this early stage he fashioned himself as an autonomous scholar who planned and completed his endeavour on his own.

The Virtuous Rubbish Collector, the Enlightened Advocate

Most dictionary writers combined different narratives of quite contradictory content to fashion themselves as worthy scholars, thereby proceeding almost in the sense of Lévi-Strauss' concept of *bricolage*.[62] Another widespread approach was to staunchly stick to the title of compiler, to enrich it with the critical renown of the commentator and to turn it all into a display of virtuous humility. The founding model was developed by Pierre Bayle. From the beginning, it was meant to oppose the long-awaited dictionary of the French Academy, which demonstrated its distinction by limiting its vocabulary to polite speech and writing. In the anonymously published *Project and Fragment of a Critical Dictionary*, Bayle advertised his book as "a collection of the rubbish by the republic of letters."[63] He replaced the aesthetic purism of the French Academy with an epistemic purism, promising to clean up the errors that obstructed the pursuit of understanding. As a major source of errors, he identified his principal competitor Moréri's *Grand dictionaire historique*. The plan was not addressed to a potential

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[61] Samuel Johnson, *The Plan of an English Dictionary* (London 1747), 33.
[62] Claude Lévi-Strauss, *La pensée sauvage* (Paris 1962), 32.
[63] Pierre Bayle, *Projet et Fragmens d'un Dictionnaire critique* (Rotterdam 1692), unpaginated.

patron, but to a fellow scholar, who was warned that he could find himself in the book, too, in case "some mistake has escaped you." Bayle tried in this way to meet his ideal of the republic of letters as an independent community of mutually critical friends. Eventually, his dictionary proved to be more than a collection of mistakes, but the *Preface* remained a deft exercise in self-denial. Bayle, by then one of the most respected and best connected men of letters throughout Europe, assured his readers that he had only cared to compile, and he equated himself to "Subaltern Officers, or even common Soldiers" who criticised their generals for some mistakes while acknowledging that they were "infinitely Inferior in Capacity as well as in Rank."[64] Working on the dictionary, he mentioned, cost him four years of hard labour and repeated sickness. Had he not been pushed by his publisher, he would have issued it anonymously because "nothing seem'd to me more noble than to shew in all the Services that are done to the Publick, the same Disinterestedness that the Gospel prescribes in Works of Charity." About those who would not believe him, Bayle remarked:

> They'll think that my Scruples were grounded upon the little Honour that is to be got by appearing at the Head of a large Compilation, which they'll call *a Common-shore of Collections* [égout de recueils], *a Rhapsody of a Transcriber*, &c. Of all the Employments, will they say, that can be had in the Commonwealth of Learning, there is none so contemptible as that of Compilers: they are the Drudges of great Men; and indeed they are not useless.[65]

Bayle's insistence that he was doing a useful job of extremely low standing came in a tone of authority and aplomb that elegantly undermined his explicit message. Talking at length about himself served the purpose of presenting the author, not the work as an original, and gaining the status of a selfless individualist, stubbornly bucking the trend in order to benefit the republic of letters.

Bayle's self-promotion inspired quite a few lexicographers, especially on the other side of the Channel. John Harris, in his *Lexicon Technicum* of 1704, positioned himself against the French academicians as well, bringing forward the utilitarian argument that he would counter their "bare Explication of Terms of Art" with an empiricist approach using first-hand observation and presenting cuts and figures.[66] Chambers had recourse to

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[64] Preface in Bayle 1697 (note 8), 7; the translation follows the first English edition of 1710 (note 8), unpaginated.

[65] Ibid., 11; preface to the first French edition in Bayle 1710 (note 8), unpaginated.

[66] Harris' depiction of the *Dictionnaire de l'Académie française* could as well have been inspired by the preface to the first edition of Antoine Furetière's *Dictionnaire universel,*

Bayle, when he tried to uphold the lexicographer's right to compile and when he took a few steps on the rhetorical road of humility.[67] It was Johnson, however, who owed Bayle the most. Already at the outset of his *Plan* he stressed that his work was "generally considered as drudgery for the blind."[68] Eight years later, the dictionary's *Preface* started with a depiction of lexicographers as "unhappy mortals", whom mankind considered "doomed only to remove rubbish and clear obstructions from the paths through which Learning and Genius press forward to conquest and glory." And it ended with the remark that Johnson had completed his work "amidst inconvenience and distraction, in sickness and in sorrow."[69]

Johnson's self-promotion has always enjoyed great credibility because of his well-documented ordeal during the dictionary's production. Yet, when Johnson made his bitter remarks about the life of lexicographers, Ephraim Chambers had, courtesy of his *Cyclopaedia*, already been peacefully at rest in Westminster Abbey for fifteen years—the most prestigious address for a dead English author. Johnson, who, according to Boswell, claimed to have based his literary style on Chambers' "Proposal for his Dictionary", could hardly have overlooked the anachronism of his role play.[70] He anticipated correctly, though, that imitating and exaggerating an outdated model developed sixty years earlier could catapult him to even greater fame if his dictionary proved a success. When it did, his self-portrayal as an unrecognised hero sacrificing himself for the English language was transformed into a "robust genius, born to grapple with whole libraries."[71]

In France, Bayle is often seen as the pivotal lexicographic precursor to the encyclopédistes, mostly because his *Dictionnaire* served a critical function and challenged Christian orthodoxy. The self-promotion of the encyclopédistes, though, could hardly have been more different from Bayle's.

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whose anonymous author is also believed to be Pierre Bayle. There, he limited the function of the Academy dictionary to "fixing the fine minds who have a panegyric to write, a play, an ode, a translation, a history, a moral treatise or such other nice books." Preface in Furetière 1690 (note 8), unpaginated; John Harris, 'The Preface', in *Lexicon Technicum* 1708 (note 9), vol. 1, unpaginated. Questioning Bayle's authorship of Furetière's preface: Behnke 1996 (note 37), 44.

[67] On Bayle's influence on Chambers, Yeo 2001 (note 13), 42–46; for an example of Chambers' defence of compilers see the quotation at the head of this article.

[68] Johnson 1747 (note 61), 1.

[69] Samuel Johnson, 'Preface', in *A Dictionary of the English Language* 1755 (note 27), I: unpaginated.

[70] Boswell 1791 (note 7), I: 119.

[71] Ibid., 47.

In constructing lexicographers as representatives of the Enlightenment, other writers had done more preliminary work, some of which one might not initially expect such as the anonymous Jesuit authors of the *Dictionnaire de Trévoux*. While copying most of their alphabetical entries from Basnage's edition of Furetière, they composed a long preface in which they advertised their work in an astonishingly advanced way.

Once again, the dictionary of the French Academy served as the point of departure. The *Immortals* had propagated the ideal of a cultural standstill, using the argument that the French language had, under the Sun King's reign, reached a "glorious point of immutability", which was to be fixed forever by their dictionary.[72] Furthermore, they had announced that they would not include citations from literary works to exemplify the right usage of words because many of "our most famous orators and our greatest poets" contributed to the work. This was not completely accurate, as the prestigious authors within the Academy had generally kept their distance from the dictionary project, while some minor members had brought it forward. However, there was hardly a better way to prove not to be a compiler than by declaring other authors irrelevant for the task.[73]

The Jesuits answered the academicians' display of authority with an elaborate reflection on the relation of authors and readers, which they compared to that between legal authorities and citizens. First, they distinguished two types of dictionary authors, those officially recognised as "the most versed in language" and those acting as "private individuals" [simples particuliers—in legal terminology persons without public functions]. The academicians were consigned to the former category and all others—"Richelet, Furetière etc."—to the latter. While the academicians enjoyed every power to declare their understanding of words as the correct one, the private individuals, "as enlightened as they might be", lacked "the authority to decide on their own." Therefore, they were compelled to cite examples from canonical texts, whereas the academicians were entitled not to cite at all. Drawing an intermediate conclusion, the Jesuits declared:

> In this respect, one has to regard the Academy as a sovereign court that has the right to pass sentences without being forced to render an account; the others, instead, can only be seen as advocates whom one consults and who

[72] Epistre in *Dictionnaire de l'Académie françoise* 1694 (note 8), fol. aiii r.
[73] Preface ibid., unpaginated.

> are only credible as far as they are predicated on good reasons, or on true testimonies.[74]

After associating the two types of dictionary writers with different legal roles, the Jesuit authors turned to the readers, asking which type they might prefer. The answer was predictable—they would go with those who cite—but the explanation was bold, voicing thinly veiled criticism of the Sun King's authoritarian regime. The public, they said, preferred citations because of

> the natural pride of the human mind, which does not like to be controlled, and which suffers impatiently if one wants to subject it and act sovereignly over it, by imposing absolute laws without letting it know the motives and reasons. This kind of blind submission, which it thinks is demanded of it, has something that shocks and appals it; in contrast, it is agreeably flattered by the deference and attention, which those pay to its wit [lumières] who put nothing forward without backing it up with solid proof and good testimony.[75]

Here, the imagery shifted from the legal to the political stage, and the promotion of a dictionary with citations ended on the note that the reader would regard its authors "like enlightened friends, who deliberate with him" and who allow him "the freedom to comply" when judging a proposal appropriately.

As early as 1704, the juxtaposition of an absolutist and an enlightened lexicographer was established. It was completed in the second edition of 1721 with the remark that the work had made much progress thanks to countless corrections and recommendations sent in by learned readers.[76] Writing anonymously helped to open the door to an egalitarian conception of the author-reader relationship.

For the Jesuit authors of the *Dictionnaire de Trévoux*, being devoted to enlightened communication did not mean being critical of religion; it rather meant, as they announced in the preface as well, to give ample information on all different religions without judging the theological validity of their beliefs. Following Bayle's judgement (directed against Moréri) that "there is nothing more ridiculous than a dictionary in which one plays the

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74 Preface in *Dictionnaire de Trévoux* 1704 (note 8), fol. ei v.
75 Ibid.
76 Preface in *Dictionnaire de Trévoux* 1721 (note 8), fol. viii.

controversialist", they promised to leave it to the theologians to "refute the errors and to establish the truths" in matters of religion.[77]

On this issue, the encyclopédistes would take a different stance. Diderot and d'Alembert accepted "the democracy of the republic of letters" and equally thanked their well-meaning critics for their suggestions, but for the rest, they rather chose the role of enlightened controversialists with religious beliefs as their preferred target. The polemical vein of their lexicography was reflected as well in their treatment of less well-meaning critics, whom they dismissed as "subaltern censors" and ignorant pedants "with no right and no title" to make a judgement.[78] Aligning themselves with "the truly illustrious men of our century", they denied that the rest could speak to them on equal terms. Speaking down to opponents suited the overall strategy of Diderot and d'Alembert to fashion the authorship of the *Encyclopédie* not as "private individuals", but as an alternative academy. Because they lacked the institutional charisma of the French Academy, they had to display and defend their intellectual excellence more aggressively. And even if they were very talented at this, they were only able to prevail thanks to powerful protectors.

When d'Alembert was elected to the *Académie française* in 1754, he soon got tired of the *Encyclopédie* and the fights surrounding it; he quit the editorship in the middle of its deepest crisis in 1758 and from then on reduced his contributions too. A few years later, he took up the preparation of the fifth edition of the Academy's dictionary, together with another encyclopédiste, Marmontel.

Conclusion

Eighteenth-century encyclopaedias and dictionaries played an eminent role in processing, organising and editing knowledge in a time of accelerated knowledge creation. In order to fulfil this role, dictionaries needed to swiftly adapt to the current state of learning. As a genre, they succeeded by gradual innovation from the 1690s and not, as the revolutionary renown of the *Encyclopédie* and Johnson's *Dictionary* suggests, by massive breakthroughs. In terms of framing the enlightened scientific dictionary,

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[77] Preface in *Dictionnaire de Trévoux* 1704 (note 8), fol. eiii r; Bayle's quotation in id. 1692 (note 63), unpaginated.

[78] Jean le Rond d'Alembert, 'Avertissement des Editeurs', in Diderot and d'Alembert 1751–1772 (note 21), III: i–xiv: xi.

Chambers was probably more innovative than Diderot and d'Alembert, and so was Furetière for language dictionaries in comparison to Johnson. The main difference was that Furetière and Chambers did not call equal attention to their originality, hardships and high self-esteem. The public image of dictionaries was to a large extent formed by their authors' self-promotion.

By acting as universal geniuses, who willingly sacrificed themselves for a thankless task, Johnson and the encyclopédistes made the most of a generally uncomfortable situation for lexicographers. They had to reposition themselves in a learned culture that hailed new knowledge, glorified inventors and called for discoveries, while disparaging the traditional role of lexicographers as compilers. Despite the growing epistemic functionality and public success of dictionaries, dictionary writers faced greater status insecurity because the modern knowledge economy did not provide an adequate role model for their task; instead of revaluing scholars, who occupied complementary positions to scientific inventors and discoverers, it established a dichotomy between original and unoriginal thinkers.

In such a system, lexicographers could only achieve literary glory if they claimed the status of original genius and disguised the actual nature of their scholarship. It was a tactic of self-denial that did not help to raise the profile of lexicographers in the long run. Neither did it contribute to the solution of one of modernity's most persistent self-created problems: how to estimate and integrate forms of knowledge production that do not fit the concept of original invention.

BETWEEN STATUS ATTAINMENT AND PROFESSIONAL DIALOGUE: THE SIGNIFICANCE OF MEMBERSHIP IN THE LEOPOLDINA IN 1750

Marion Mücke

"In an especially noble gesture, you, honoured Sir, have chosen to raise a lowly and deflated soul from the dust of contempt, revive it with a new spark, and encourage it to promote the useful and pleasurable sciences."[1]

In these words written in 1750, along with many more, as was customary at that time, Johann Ambrosius Beurer (1716–1754), an apothecary from Nuremberg, expressed his thanks to Andreas Elias Büchner (1701–1769), the current president of the *Leopoldina*, for his admission into the illustrious circle of this German academy of natural scientists. The striking metaphor concerning the "dust of contempt" from which the apothecary was lifted by his admission into the academy raises questions about the significance of membership in the *Leopoldina* in the middle of the eighteenth century. Starting with this particular case, we shall examine below different processes of acceptance into this academy, with a view to the motives and interests of both the applicants and the representatives of the academy. An introductory outline of the founding and aims of the academy will facilitate understanding of this endeavour.

Founding of the *Leopoldina* in Schweinfurt and Initial Difficulties

By the time of Beurer's admission in 1750, the German Academy of Natural Scientists had indeed already achieved the status of a renowned establishment rich in tradition, whose president was then just beginning to make plans for festivities to celebrate its 100th anniversary. The *Leopoldina* was

[1] Johann Ambrosius Beurer to Andreas Elias Büchner, Nuremberg, 19 December 1750 (Leopoldina Archives, MNr. 566), in Marion Mücke and Thomas Schnalke, *Briefnetz Leopoldina. Die Korrespondenz der Deutschen Akademie der Naturforscher um 1750* (Berlin 2009), 227, lines 135–138. The present paper is based on work done in relation to editing an exchange of letters between the sixth president of the Leopoldina, Andreas Elias Büchner (1736–1769), and the then *Director Ephemeridum*, Christoph Jacob Trew (1743–1769): ibid. I also wish to express particularly warm thanks to Heinrich Bosse, the chair of my conference session, for his valuable suggestions and encouragement.

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founded as the *Academia naturae curiosorum* in 1652, only a few years after the end of the Thirty Years War, by four physicians in the Franconian free imperial city of Schweinfurt. It is thus the oldest of the academies in the German-speaking world focusing on natural science and medical science still in existence today.[2] Its founding took place at a time of multi-faceted considerations about how to organise scholarly exchange of ideas and knowledge generation outside of universities. Similar projects were implemented in several European centres with the support of politically influential persons.[3] But by contrast with the Royal Society in London, which was granted a royal charter in 1662, and the *Académie des Sciences* in Paris, founded in 1666 under the guiding influence of the French minister of finance Jean-Baptiste Colbert (1619–1683), the *Leopoldina* arose not in the intellectual, economic, or political centre of a highly centralised monarchy but apart from the major German residential and university towns in the free imperial city of Schweinfurt.[4] Also of little renown are the founding fathers of the *Academia naturae curiosorum*, the local city physician Johann Laurentius Bausch (1605–1665) and the physicians Johann Michael Fehr (1610–1688), Georg Balthasar Wolfahrth (1607–1674) and Georg Balthasar Metzger (1623–1687), who also practiced in Schweinfurt. At a ceremonial gathering on 1 January 1652, these individuals elected Johann Laurentius Bausch as the first president of their association. Fehr and Metzger were installed at his side as adjuncts. These founding fathers of the *Leopoldina* looked to the Italian academies of the

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[2] On the early history of the *Academia naturae curiosorum*, see especially Mason Barnett, *Medical Authority and Princely Patronage: The Academia naturae curiosorum, 1652–1693* (Chapel Hill 1995); id., 'Anspruch und Wirklichkeit. Reformen in der frühen Academia naturae curiosorum', in Detlef Döring and Kurt Nowak (eds.), *Gelehrte Gesellschaften im mitteldeutschen Raum, 1650–1820* (Stuttgart and Leipzig 2002), 2 vols., I: 47–72; Uwe Müller, 'Die Leopoldina unter den Präsidenten Bausch, Fehr und Volckamer (1652–1693)', in Benno Parthier and Dietrich von Engelhardt (eds.), *350 Jahre Leopoldina—Anspruch und Wirklichkeit. Festschrift der Deutschen Akademie der Naturforscher Leopoldina, 1652–2002* (Halle 2002), 45–93; id., 'Johann Laurentius Bausch und Philipp Sachs von Lewenhaimb. Von der Gründung der Academia Naturae Curiosorum zur Reichsakademie', in Richard Toellner et al. (eds.), *Die Gründung der Leopoldina—Academia Naturae Curiosorum—im historischen Kontext. Leopoldina-Symposion vom 29. September bis 1. Oktober 2005 in Schweinfurt* (Stuttgart 2008), 13–41; and Richard Toellner, 'Im Hain des Akademos auf die Natur wißbegierig sein: Vier Ärzte der Freien Reichsstadt Schweinfurt gründen die Academia Naturae Curiosorum', in Parthier and von Engelhardt 2002 (note 2), 15–43.

[3] On the academy movement of the seventeenth century, see Gerhard Kanthak, *Der Akademiegedanke zwischen utopischem Entwurf und barocker Projektemacherei, zur Geistesgeschichte des 17. Jahrhunderts* (Berlin 1987).

[4] See Uwe Müller, 'Der Reichsstadtgedanke in Mainfranken', *Frankenland: Zeitschrift für fränkische Landeskunde und Kulturpflege* 40 (1988), 226–236.

sixteenth century as institutional models. Their own scholarly self-image was derived from the idea of Renaissance Humanism; they defined themselves as *Naturae Curiosi*—those who thirst for knowledge of natural history[5] and aspire to dedicate themselves to research of nature in a spirit of collegial cooperation.

Study and knowledge of the relationships found in Nature seemed necessary to the founders of the Academy in order to "enlighten and spread the practice of medicine to the benefit and advantage of our fellow human beings", as Johann Laurentius Bausch put it in an appeal to external physicians to join in the work of the Academy.[6] The founding fathers formulated their concept of what the Academy should be in the *Leges*, the earliest, handwritten version of which dates from 1652.[7] Membership was to be composed exclusively of medical doctors. The president of the Academy was to assign each member a topic concerned with plants, minerals, or animals for scientific research on a semi-annual basis. On the 1st of January and the 1st of July of each year a research paper on this topic was to be returned to the president. The Academy's founders aimed to produce a series of monographs that would contain all existing knowledge about contemporary remedies.[8] This goal proved to be overly ambitious, however, as the amount of work involved in compiling such an "encyclopedia" of medicines exceeded the capacities of the Academy members, who as a rule worked primarily as practicing physicians. By the time of Bausch's death in 1665 only three works had been published as part of the Academy's programme.[9] Moreover, in light of the small total membership of only 29 individuals who had joined the Academy since its founding, the overall development of this learned society could not be considered

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[5] See Toellner 2002 (note 2), 25–35; Laetitia Böhm, 'Akademie-Idee und Curiositas als akademisches Leitmotiv der früh-modernen Leopoldina', in Toellner et al. 2008 (note 2), 63–114: 97–98.

[6] See Johann Laurentius Bausch, *Epistola invitatoria* (hand-written version of 1652, University Library of Erlangen-Nuremberg, Korr. J.L. Bausch, no. 2), quoted in German translation in Müller 2002 (note 2), 50.

[7] See Leges (1652) in 14 paragraphs, ibid., 50–51.

[8] See Wieland Berg, 'Die frühen Schriften der Leopoldina—Spiegel zeitgenössischer "Medizin und ihrer Anverwandten"', in Uwe Müller (ed.), *Salve Academicum. Festschrift der Stadt Schweinfurt anläßlich des 300. Jahrestages der Privilegierung der Deutschen Akademie der Naturforscher Leopoldina durch Kaiser Leopold I. vom 7. August 1687* (Schweinfurt 1987), 15–23: 16.

[9] See Wieland Berg and Jochen Thamm, 'Die systematische Erfassung der Naturgegenstände. Zum Programm der Academia Naturae Curiosorum von 1652 und seiner Vorgeschichte', in Toellner et al. 2008 (note 2), 285–304: 295.

satisfactory at that point. As reasons for this stagnation[10] contemporaries cited in particular the great amount of work required of members to perform the tasks expected of them and produce comprehensive monographs in addition to their professional responsibilities. However, these contemporaries also pointed out organisational and infrastructural deficiencies that hampered the work of the Academy—particularly the peripheral location of Schweinfurt, the decentralised structure of the Academy and related difficulties in communicating by letter, as well as a lack of technical and financial endowment.

The time-consuming publication of monographs and the conceptual model of treating all aspects of a topic exhaustively and in light of the entire existing literature also seemed increasingly inappropriate for the time. Although the encyclopaedic approach was in line with the research style of the day and members of the *Leopoldina* received recognition for their work,[11] they were still criticised for work that was insufficiently independent and offered too little in the way of new insights.[12]

Early Reforms: The Founding of a Journal and Imperial Patronage

Criticism of the organisation and working methods of the *Academia naturae curiosorum* led to a reform of the *Leges*.[13] Efforts were now to be substantially concentrated on gaining official recognition for the Academy and its statutes and on publication of its own journal, on the model of the Royal Society. A new programme was ready by summer of 1669 at the latest and was first published in the Academy's newly founded journal in 1671.[14] The Academy sought to gain the protection of the emperor and princes of the empire [Reichsfürsten] without which it would not be able

[10] See Barnett 2002 (note 2), 48–55; Müller 2002 (note 2), 52–54.

[11] On the working methods of the early *Leopoldina* authors, see Barnett 2002 (note 2), 60–67.

[12] See, for example, the criticism of François Sluse (1622–1674) in a letter of autumn 1669 to the Secretary of the Royal Society, Henry Oldenburg (1618–1677), in Christoph J. Scriba, 'Auf der Suche nach neuen Wegen. Die Selbstdarstellung der Leopoldina und der Royal Society in London in ihrer Korrespondenz der ersten Jahre (1664–1669)', in Müller 1987 (note 8), 69–85: 80.

[13] For details of this reform, see Müller 2002 (note 2), 57–61.

[14] Leges (1671) in 21 paragraphs. Originally published in *Miscellanea curiosa sive Ephemeridum*, decuria 1, vol. 2 (1671) and later with additional annotations in Andreas Elias Büchner, *Academiae Sacri Romani Imperii Leopoldino-Carolinae Naturae Curiosorum historia* (Halle 1755), 187–197; the text of the edition of 1755 with annotations and a German

to subsist. A preprint of the first volume of the *Ephemerides*, the world's first professional medical journal, was presented by the Academy in 1670 at the Frankfurt Easter Fair as a sample, and a copy inscribed with a dedication to the emperor was sent to Vienna. Emperor Leopold I (1640–1705) accepted this dedication, marking the beginning of an almost twenty-year effort by the Academy to achieve recognition and privilege from the emperor, to whom the free imperial city of Schweinfurt was immediately subject.[15] With the imperial privilege of 3 August 1677, Leopold I acknowledged the 1671 edition of the *Leges* and granted the *Academia naturae curiosorum* the status of an imperial academy [kaiserliche Reichsakademie]. Further hopes harboured by the Academy were fulfilled by the privilege of 7 August 1687 and a supplementary privilege of 3 July 1688. Of particular importance were an imperial grant of freedom from censure and a prohibition on illegal reprints. Another important new development was permission to use the name of Emperor Leopold I in the Academy's name, meaning that it would henceforth be known officially as the *Sacri Romani Imperii Academia Caesareo-Leopoldina Naturae Curiosorum*, which was later shortened to *Leopoldina* in everyday parlance.

Consolidation and Progress of the *Leopoldina* to the End of the Seventeenth Century

Thanks to these reforms, the publication of its own journal, and imperial protection, the *Leopoldina* was able to consolidate by the end of the seventeenth century and make itself visible in the scholarly world, successfully repositioning itself for the long term. The positive impact of the new developments was apparent not least of all in a considerable increase in new members.[16] In particular, the more relaxed conditions for collaboration that had become available owing to the periodical now published by the *Leopoldina* made membership attractive. Members were now required to contribute to the journal, and to invite physicians and natural scientists whom they knew and who were not members to do the same. Indeed, the journal found great reception among non-members of the

translation can be found in Uwe Müller, 'Die Leges der Academia Naturae Curiosorum 1652–1872', in Toellner et al. 2008 (note 2), 243–264: 253–262.

[15] On imperial patronage, see Barnett 1995 (note 2), 290–328; Müller 2002 (note 2), 68–78.

[16] On the increase in membership, see Barnett 1995 (note 2), 287–289; Müller 2002 (note 2), 78.

Academy, especially in its initial phase,[17] as there were few opportunities to publish in German-speaking Europe at the time aside from individual monographs.[18] The editorial policy called for reports of individual observations and experiments, henceforth from all areas of medicine as well as related topics. With this new publication format which condensed and accelerated scholarly exchanges of opinion and knowledge, and with the scope of topics covered expanded beyond medicine, it was also possible for a physician engaged in daily practice to share his own observations—usually brief ones—with his medical colleagues. In order to facilitate submission of contributions by physicians, the revised statutes of 1669/1671 expressly provided that members of the Academy refrain from making critical judgments on contributions received. They were free, however, to add a scholium in the form of explanatory comments, free of any harsh undertone, where warranted.[19]

A further change in the statutes led to an increase in membership. While the founding fathers had sought to limit the circle of Academy members exclusively to physicians holding a doctorate, it was now possible for *physici*—natural historians[20] who had earned a doctorate or a licentiate or who had at least an appropriate level of scholarship [eruditio][21]—to be admitted along with *medici*. The *Leopoldina* was thus open to natural historians without doctorates and even without academic training. Finally, the symbol of the Academy that had been chosen already by Bausch—an open book held by two snakes in which an eye was depicted on one page and a plant on the opposite page—was adopted and complemented by

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[17] See Müller 2002 (note 2), 62.

[18] Founded in 1665, in rapid succession, were the *Journal des Sçavans* in Paris and, several months later, *Philosophical Transactions*, published by the Royal Society. *Acta Eruditorum*, edited by the Leipzig scholar Otto Mencke (1644–1707), first appeared in 1682. On the development of medical journals in German-speaking Europe, see Karl Sudhoff, 'Das medizinische Zeitschriftenwesen in Deutschland bis zur Mitte des 19. Jahrhunderts', *Münchener medizinische Wochenschrift* 11 (1903), 455–463: 455–457; and Tilman Rau, *Das "Commercium litterarium". Die erste medizinische Wochenschrift in Deutschland und die Anfänge des medizinischen Journalismus* (Bremen 2009), 17–41.

[19] Leges (1671), paragraph 17, in Müller 2008 (note 14), 259–260. On the need for common pursuit of knowledge and implicit distancing from the academic disputes that took place at universities in the seventeenth century, see Detlef Döring, 'Universitäten und gelehrte Sozietäten im 17. Jahrhundert', in Toellner et al. 2008 (note 2), 43–61: 49–51 and 57–59.

[20] See the entry entitled 'Physicus' in Johann Heinrich Zedler, *Grosses vollständiges Universal-Lexicon* 27 (1741), col. 2238, with reference to the entry entitled 'Naturkundiger', ibid., 23 (1740), col. 1145.

[21] Leges (1671), paragraph 9, in Müller 2008 (note 14), 255.

the motto *nunquam otiosus* [never at leisure].[22] In choosing this motto the academicians in Schweinfurt rejected the notion derived from the ancient concept of scholarly leisure as scholarship free of official functions; they thereby underscored the claim that their activities in medical and natural science would serve a useful purpose. In this sense Bausch, to whom the guiding principle of the *Leopoldina* is ascribed,[23] had already put investigation of the "best and most useful creations of God, namely . . . natural phenomena", at the centre of the Academy's efforts in his founding appeal of 1652.[24] The purpose of the Academy was to promote natural science, to which an individual with an incessant thirst for knowledge—the *vir curiosus*—was to dedicate himself.[25]

The world's first journal devoted exclusively to natural history and medicine was to appear in Latin and thus appeal to an international audience. Accordingly, the invitation contained in the prefix to the first volume of the *Ephemerides* was addressed "*ad Celeberrimos Europae Medicos*"—to the most eminent physicians in all of Europe.[26] At the same time, this condition limited circulation and use of the journal to physician colleagues and scholars of natural history who were conversant with Latin. Three ten-volume editions [decuriae] of the *Miscellanea curiosa medico-physica Academiae Naturae Curiosorum sive Ephemeridum medico-physicarum Germanicarum curiosarum* appeared between 1670 and 1706. Ten volumes were printed between 1712 and 1722 under the title *Academiae Caesareo-Leopoldinae Naturae Curiosorum Ephemerides*, followed by another ten volumes between 1727 and 1754 carrying the title *Acta physico-medica Academiae Caesareae Leopoldino-Carolinae*. Beginning in 1757, the journal was finally issued continuously for 171 years, until 1928, under the title *Nova Acta physico-medica Caesareae Leopoldino-Carolinae Naturae Curiosorum*.

From 1731, in addition to contributing to the journal, members of the Academy were also expected to participate in establishing and developing a library and a natural history collection.[27] Efforts to create these facilities

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[22] Leges (1671), paragraph 21, ibid., 261–262.

[23] On both the symbol and the significance and authorship of the motto of the *Leopoldina*, see Wieland Berg and Georg Drescher, 'Das Symbol der Akademie', in Uwe Müller (ed.), *Salve Academicum II. Beiträge zur Geschichte der Deutschen Akademie der Naturforscher Leopoldina* (Schweinfurt 1991), 77–108: 77–82 and 84–85.

[24] Johann Laurentius Bausch, *Epistola invitatoria*, quoted from German translation in Müller 2002 (note 2), 50.

[25] See especially Toellner 2002 (note 2), 34.

[26] See Müller 2002 (note 2), 61–62.

[27] On the originally close relationship between these two types of collections, see Jörg-Ulrich Fechner, 'Die Einheit von Bibliothek und Kunstkammer im 17. und 18. Jahrhun-

can be traced to the founding period of the Academy.[28] Christian Mentzel (1622–1701) was later to present his ideas in this respect, which Jacob Wolff (1642–1694) and the third president of the Academy, Johann Georg Volckamer I (1616–1693) took up again in 1690.[29] But it was the Academy's fifth president, Johann Jacob Baier (1677–1730), who first succeeded in realising this proposal "pro utilitate publica Collegarum", i.e. for the general benefit of the Academy members.[30] Following the accession to office of the sixth president of the Academy, Andreas Elias Büchner, the collections were moved from Nuremberg to Erfurt, where Büchner had been born and currently resided. When Büchner was called to Halle in 1745, he left both the library and the collections in Erfurt and named a local professor of medicine, Johann Hieronymus Kniphof (1704–1763), as librarian. In 1755 Büchner published the first printed library catalogue for the *Leopoldina*, based on an earlier catalogue of holdings drawn up by Baier. It listed books in the chronological order in which they had been received, along with the name of the respective donor.[31] This catalogue, as well as another published in 1767,[32] was sent to members of the Academy to inform them about the library's holdings and to guide them in selecting further works to add to the library's collection. Holdings grew to a total of 2,445 volumes by 1766, 1,000 of which alone could be traced to gifts made by the *Director Ephemeridum* Christoph Jacob Trew (1695–1769).[33] Use of the library by Academy members was limited, however. In accordance with Büchner's

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dert, dargestellt an Hand zeitgenössischer Berichte', in Paul Raabe (ed.), *Öffentliche und private Bibliotheken im 17. und 18. Jahrhundert. Forschungsinstrumente oder Bildungsstätten*? (Bremen and Wolfenbüttel 1977), 11–31: 14–15.

[28] See *Protocollum Academiae Caesareo-Leopoldinae Naturae Curiosorum, inceptum ab ejus collega et praeside*, Celso [Lucas Schroeck] 1694 [hand-written chronicle of the Academy from 1651–1788 (unpublished), translated by Klaus Lämmel, Halle a.d. Saale] (Leopoldina Archives), entry for 1653.

[29] On the founding and early development of the library and the natural history collection, see Oscar Grulich, *Geschichte der Bibliothek und Naturaliensammlung der Kaiserlich Leopoldinisch-Carolinischen Deutschen Akademie der Naturforscher* (Halle a.d. Saale 1894), 4ff.

[30] See the text of the deed of foundation, printed ibid., 11, and in Büchner 1755 (note 14), 571.

[31] Andreas Elias Büchner, *Academiae Caesareae Leopoldino-Carolinae Naturae Curiosorum bibliotheca* (Halle 1755).

[32] Andreas Elias Büchner, *Academiae Caesareae Leopoldino-Carolinae Naturae Curiosorum bibliotheca* (Halle 1767).

[33] See Bernhard Fabian (ed.), *Handbuch der historischen Buchbestände* (Hildesheim 2000), vol. 22, 98–103.

wishes, the library was to be open to the public two days per week.[34] Use of the collection was naturally limited to travelling scholars and, above all, citizens of Erfurt, particularly members of the university.[35]

The *Leopoldina* as a Supra-Regional and Bi-Confessional Learned Society in the Mid-Eighteenth Century

Recognition by the emperor in 1677 and the Privilege of 1687/1688 elevated the Academy to the status of an imperial institution, even though it continued to operate as a privately organised learned society.[36] The *Leopoldina* also continued to exist without a permanent domicile; it was located at the residence of its current president. Nor did it enjoy any regular financial support from the emperor. On the other hand, it was for the most part exempt from official requirements or interventions and, by contrast with the eighteenth-century academies in German-speaking Europe founded on the basis of territorial rule, it did not become an object of Enlightenment absolutist scientific policy.

By the middle of the eighteenth century the *Leopoldina* had a wide network of members throughout Europe.[37] Academics in the Holy Roman Empire of the German Nation were concentrated in the numerous university towns in the central part of the Empire and in free imperial cities such as Nuremberg, Augsburg, Schweinfurt, Esslingen, Frankfurt am Main,

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[34] Andreas Elias Büchner to Christoph Jacob Trew, Halle, 17 March 1752 (University Library of Erlangen-Nuremberg, Trew letter collection, Büchner corr., no. 40), in Mücke and Schnalke 2009 (note 1), 208, line 90.

[35] Horst Schyra, *Der Lehrstuhl der Anatomie, Chirurgie und Botanik an der Universität Erfurt während der ersten Hälfte des 18. Jahrhunderts*, dissertation in medicine, University of Erfurt, 1959, quoted in: Wolfram Kaiser, 'Andreas Elias Büchner im Dienste der Hochschule und Akademie', in id. et al. (eds.), *Dem humanistischen und fortschrittsfördernden Wesen der Wissenschaft verpflichtet. Zur Zusammenarbeit der Martin-Luther-Universität Halle Wittenberg mit der Deutschen Akademie der Naturforscher "Leopoldina" anlässlich der 100. Wiederkehr ihres Tages der ständigen Niederlassung in Halle* (Halle a.d. Saale 1978), 11–30: 16.

[36] On the history of the *Leopoldina* in the mid-eighteenth century, see Thomas Schnalke, 'Wissenskommunikation und Wissenschaftsorganisation jenseits der Universitäten. Die deutsche Akademie der Naturforscher Leopoldina um 1750 im Spiegel der Korrespondenz zwischen Andreas Elias Büchner und Christoph Jacob Trew', in Döring and Nowak 2002 (note 2), II: 73–94; id., 'Die korrespondierende Akademie—Organisation und Entwicklung der Leopoldina um 1750', in Parthier and von Engelhardt 2002 (note 2), 95–119.

[37] On the regional distribution of members, see Mücke and Schnalke, 2009 (note 1), 28–30, with references to additional literature, particularly by Wolfram Kaiser and Arina Völker.

Giengen, Goslar, Nordhausen, Nördlingen, Ulm, Regensburg, Schwäbisch Hall, and Strassbourg. During the time of the presidency of Andreas Elias Büchner—initially, from summer of 1735, as provisional president, and from 1736 to 1769 as official president—134 towns were identified as the places of residence of 274 new members of the Academy. Eighty-six of these towns were home to only one member each, while only 6 towns—Halle, Nuremberg, Berlin, Göttingen, Leipzig and Vienna—had more than five members each. This scattered and isolated situation of members, which meant that it was hardly possible for them to become acquainted through direct dialogue, reflected the restriction of Academy membership to physicians and researchers in natural history, who represented only a small segment of society in proportion to the total population. Particularly striking is the clear concentration of membership in the Protestant territories of the German Empire. The *Leopoldina* had Protestant origins[38] and it developed as a network of overwhelmingly Protestant physicians. Thus, during the first 80 years of its existence it was domiciled in the Protestant imperial cities of Schweinfurt, Nuremberg, and Altdorf (on Nuremberg territory), as well as in bi-confessional and jointly administered Augsburg. At the same time, the Academy was non-denominationally oriented and maintained relations with physicians in Catholic territories from the outset.[39] Above all, the intensive efforts to obtain privileging at the imperial court in Vienna, pushed by the Academy's members in Breslau, made clear how important it was to have a connection to politically significant centres of the empire. Successive presidents from 1670 attempted to ensure this connection by targeting personal and court physicians at the Catholic courts in Vienna, Mainz and Munich for admission to the Academy.[40] With the increase in members at the end of the seventeenth century, the number of Catholic members abroad grew as well, and also included clergymen. Particularly the early presidents of the *Leopoldina* had a wide range of

[38] On the founding fathers of the *Leopoldina* as the offspring of Protestant refugees, see Toellner 2002 (note 2), 16–17; for more details on the life of Johann Laurentius Bausch, see Müller 2008 (note 2), 17–23.

[39] Among these was, for example, Nikolaus Balthasar Mertz, born in Würzburg (dates unknown), who was an archiater and poliater (city physician) in Fulda, and later a physician in Bamberg. He became the 14th member of the Academy by invitation in 1654. See Büchner 1755 (note 14), 463, and *Protocollum* (note 28), entry for 1654.

[40] See Marion Mücke, 'Wissenschaft im Netz. Die Deutsche Akademie der Naturforscher (Leopoldina) und ihre Verbindungen nach Wien um 1750', in Sonia Horn, Gabriele Dorffner and Rosemarie Eichinger (eds.), *Wissensaustausch in der Medizin des 15. bis 18. Jahrhunderts* (Wien 2007), 25–44: 28. On the membership structure in general in the mid-eighteenth century, see Mücke and Schnalke 2009 (note 1), 69–71.

personal contacts in northern Italy, which originated in the *peregrinatio academica* [academic pilgrimage] to Italian universities customary at the time, especially to the University of Padua, "a non-denominational attraction for physicians from all parts of Europe".[41] Among the members from northern Italy, for example, was Charles Patin (1633–1693),[42] a professor of medicine at Padua who had been proposed for membership by Lucas Schroeck[43] (1646–1730) and accepted into the Academy in 1679. Patin was followed in 1690 by professor of medicine and botany Giuseppe Lanzoni (1663–1730) from Ferrara and city physician Giovanni Battista Scaramucci (d. 1706) from Senigallia and Macerata.[44] Professor of medicine Pyrrhus Maria Gabrielli (1643–1705) of Siena, who was recommended by Lanzoni, and the Cistercian monk and botanist Paolo Boccone (1633–1704), recommended by colleagues in Breslau, were both admitted in 1696.[45] Gabrielli, in turn, recommended the poet, historian, and curator of the *Accademia dell'Arcadia*, Abbot Giovanni Maria Crescimbeni (1663–1728),[46] who was accepted in 1701. In 1703 Schroeck admitted the Roman professor and anatomist Anton Pacchioni (1665–1726)[47] on the recommendation of Franz Mayr, archiater in Salzburg, and through the mediation of the court physician to the prince-elector of Bavaria, Johann Ignaz Satler, neither of whom was a member of the *Leopoldina*. The city physician of Senigallia, Michelangelo Mori,[48] was admitted in 1707 after being proposed by Lanzoni. In the same year the papal chamberlain and personal papal physician Giovanni Mario Lancisi (1654–1720) and Antonio Vallisnieri (1661–1730), professor of practical medicine at Padua, were admitted on Schroeck's

[41] Thus the founding president, Johann Laurentius Bausch, had undertaken an extensive trip to Venice, Rome, Naples, Genoa and Milan and studied for several semesters in Padua, where his successor Johann Michael Fehr (1610–1688) earned the Doctor of Medicine degree in 1641, and where the Academy's third president, Johann Georg Volckamer, was pursuing his studies almost simultaneously, from 1638 to 1641. On Bausch's educational journey to Italy, see Laetitia Boehm, 'Studium, Büchersammlung, Bildungsreise: Elemente gelehrter Allgemeinbildung und individueller Ausprägung historisch-politischer Weltanschauung im konfessionellen Zeitalter', in Menso Folkerts, Ilse Jahn and Uwe Müller, *Die Bausch-Bibliothek in Schweinfurt. Wissenschaft und Buch in der Frühen Neuzeit* (Halle a.d. Saale 2000), 117–151: 133–136 and 141.

[42] Büchner 1755 (note 14), 470; *Protocollum* (note 28), entry for 1679.

[43] Lucas Schroeck, the Academy's fourth president, also undertook an educational journey through northern Italy.

[44] Büchner 1755 (note 14), 477 and 479; *Protocollum* (note 28), entry for 1690.

[45] Büchner 1755 (note 14), 482; *Protocollum* (note 28), entry for 1696.

[46] Büchner 1755 (note 14), 485; *Protocollum* (note 28), entry for 1701.

[47] Büchner 1755 (note 14), 485; *Protocollum* (note 28), entry for 1703.

[48] Büchner 1755 (note 14), 487; *Protocollum* (note 28), entry for 1707.

initiative.[49] And in the following year Schroeck invited the professor of theoretical medicine at Padua, Domenico Guglielmini (1655–1710), to collaborate in the work of the Academy. Guglielmini, in turn, proposed the then still unknown Giovanni Battista Morgagni (1682–1771) from Forli.[50] The admission of Italian members, a selection of which is referred to here, illustrates the importance of personal recommendation by an Academy member and the momentum that this system of mutual protection could develop. At least as conducive to admission into the *Leopoldina* was geographical proximity to the respective presidents of the Academy. Hence at the turn of the eighteenth century, during the term of Lucas Schroeck, the Academy's fourth president who resided in the bi-confessional town of Augsburg, several Catholic members from the Electorate of Bavaria were accepted into the Academy, including the Benedictine priest Ulrich Staudigl (1644–1720) from the monastery of Andechs, in 1701.[51] The Bavarian archiater and professor of medicine from Ingolstadt, Johann Menrad von Vorwaldtner (1651–1742), had been admitted to the Academy six years previously. Johann Adam Morasch (1682–1734) followed in 1719, and Johann Jakob Treiling (1681–1758) in 1720; both were also professors of medicine at the University of Ingolstadt. One of their students, Franz Josef Grienwaldt (1708–1743) was among the first to be accepted for membership at the initiative of Andreas Elias Büchner.[52]

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[49] Büchner 1755 (note 14), 487; *Protocollum* (note 28), entry for 1707.

[50] Büchner 1755 (note 14), 488; *Protocollum* (note 28), entry for 1708. On the connections between the *Leopoldina* and physicians in northern Italy, see Luigi Belloni, 'Aus dem Briefwechsel von G.B. Morgagni mit L. Schröck und J.J. Baier', in Erwin Reichenbach and Georg Uschmann (eds.), *Nunquam otiosus. Beiträge zur Geschichte der Präsidenten der Deutschen Akademie der Naturforscher Leopoldina. Festgabe zum 70. Geburtstag des XXII. Präsidenten Kurt Mothes* (Leipzig 1970), 107–139.

[51] See Birgitta Kjär, 'P. Ulrich Staudigl (1644–1720) von Andechs. Ein kurbayerischer Benediktiner als Mitglied der Leopoldina', *Mitteilungen der Deutschen Akademie der Naturforscher Leopoldina* 1986, series 3, 32 (1988), 181–237.

[52] Grienwaldt (sometimes also spelled Grünwaldt) had first studied in Ingolstadt and then, after one of his papers was withdrawn owing to Jesuit censorship, transferred to the Protestant University of Altdorf, where he received a doctorate in 1732. He subsequently settled in Munich, serving as personal physician to the prince-bishop of Freising and as a countryside physician. In 1733 he published the *Album Bavariae iatricae*. Between 1736 and 1740 he edited the *Parnassus boicus*, a German-language Enlightenment journal published in Munich between 1722 and 1740 and the precursor of the *Bayerische Akademie der Wissenschaften* founded in 1759. See Büchner 1755 (note 14), 505; Karl Bosl (ed.), *Bosls bayerische Biographie* (Regensburg 1983), 274; on *Parnassus boicus*, see Ludwig Hammermeyer, *Gründungs- und Frühgeschichte der Bayerischen Akademie der Wissenschaften* (Kallmünz 1959), 40–43.

Scholarship and Willingness to Achieve as Criteria for Admission

As a European-wide, non-denominational academy, the *Leopoldina* was a firmly established institution in the world of medical science and enjoyed a good reputation among physicians and natural historians in the mid-eighteenth century. This was confirmed not least of all by pertinent biographical collections from this period, such as the *Kurze Nachrichten von den vornehmsten Lebensumständen und Schriften jetztlebender Ärzte und Naturforscher*, published by Friedrich Börner (1723–1761).[53] Of the 121 individuals for whom detailed biographies were presented in this publication, 62—i.e. more than half—were members of the *Leopoldina*. And among the total of 111 scholars from all academic fields that Johann Jacob Brucker (1696–1770) presented in his "portrait gallery"[54] there were 16 members of the *Leopoldina*, which is a goodly number considering that the society's work was focused primarily on medicine and related fields.

In view of the more open possibilities for access to the Academy stipulated in the *Leges* of 1671 and the subsequent continual increase in its membership, the *Leopoldina* was not elite in the sense of a learned society maintained by the leading figures in a particular discipline.[55] Nonetheless, it was exclusive, as it continued to recruit members overwhelmingly from the community of physicians, even to the middle of the eighteenth century. Of the 274 members admitted by Andreas Elias Büchner, 215 were licensed physicians,[56] many of whom at the time of their admission to the Academy were already occupied as university professors, as officially appointed city or personal physicians in public medical administration, or as personal physicians at the courts of major and minor territorial rulers. The much smaller number of non-physician members admitted by Büchner was composed of 23 scholars from other professional fields, eight members with no university education, and seven members of the nobility. There is no accurate information about the education or the professions of the

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[53] Friedrich Börner, *Nachrichten von den vornehmsten Lebensumständen und Schriften jetztlebender berühmter Aerzte und Naturforscher in und um Deutschland* (Wolfenbüttel 1749–1764), 3 vols.

[54] Jacob Brucker, *Bilder-Sal heutiges Tages lebender, und durch Gelahrtheit berühmter Schriftsteller* (Augsburg 1741–1755), 10 vols.

[55] This view is also supported by Kaiser 1978 (note 35), 16.

[56] Information is based on the catalogue of new members, the *Catalogus Dominorum Collegarum Academiae Caesareae Leopoldino-Carolinae Naturae Curiosorum . . . receptorum*, which was included as a prefix in individual volumes of the *Leopoldina's* journal.

remaining members. According to matriculation records,[57] approximately 90 members were accepted into the Academy on the recommendation of third persons. No further details are available for another 132 members. In 46 cases Büchner indicated that admission had taken place at the wish of the candidate. This represents a proportion of about 16 per cent. Considering that among the 200 members accepted up to 1693, only 5 per cent had submitted applications themselves,[58] this indicates a significant change in the policy of admission, which was now more open.

The fundamental prerequisite for acceptance into the *Leopoldina* was the professional qualification of a candidate, from whom Büchner expected regular participation in the work of the journal above all. Contributions to the journal were sufficient, whether in the form of brief *Observationes* or longer treatises, all of which were to be compiled in one place. Not least in importance in this regard was sound competence in Latin. With few exceptions, candidates met this particular qualification, as documented by the letters of application, letters of thanks, and curricula vitae, usually written in Latin, which are on deposit in the archives of the *Leopoldina*. Lack of proficiency in Latin was also an indirect criterion for exclusion from membership.[59] In response to an inquiry from the botanical artist and illustrator Georg Dionys Ehret (1710–1770) concerning possible membership in the *Leopoldina*, the *Director Ephemeridum* Christoph Jacob Trew, with whom Ehret had worked closely for many years, at first answered with great hesitancy.[60] Trew explained that "no one else but litterati" had so far been admitted. And even the few apothecaries to whom this honour had been accorded had first had to provide proof of "their experience in *res medica* and *historia naturalis*". Ehret, on his part, called attention to the admission of the London merchant Emanuel Mendez da Costa (1717–1791) who, like Ehret, was a member of the Royal Society, and who was "not a litteratus either and, on top of this, a Jew". On the grounds that membership in the Royal Society was

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[57] See *Matricula Academicorum Naturae Curiosorum II* [1712–1791] (Leopoldina Archives).

[58] See Müller 2002 (note 2), 78.

[59] The difference between "litteratus" and "illiteratus", or learned and non-learned, which was based primarily on knowledge of Latin and on what a person had learned studying in Latin, has most recently been discussed in Heinrich Bosse, 'Gelehrte und Gebildete—die Kinder des 1. Standes', *Das Achtzehnte Jahrhundert* 32 (2008), 13–37: 14–17.

[60] See Christoph Jacob Trew to Andreas Elias Büchner, Nuremberg, 18 February 1758 (University Library of Erlangen-Nuremberg, Trew letter coll., Trew corr., no. 127), in Mücke and Schnalke 2009 (note 1), 437–438, lines 38–58.

sufficient evidence of scholarship, Ehret was eventually admitted to the *Leopoldina*.[61] The remark about Mendez da Costa's religious affiliation was ignored, whereas Büchner protested expressly against the reproach that da Costa was not a "literatus" as he had published in Latin. Ehret owed his admission to his membership in the scholarly society in London and to the protection of Trew.[62] However, the admission of an "illiterate" to the *Leopoldina* was and remained an exception.

By contrast, the social background of a candidate was irrelevant with regard to his admission to the Academy. Johann Friedrich Glaser (1707–1783/1789), for example, who had earned a doctorate in Haderwijk and later worked as a physician in Suhl, revealed in the course of his application—in fact, after Büchner had already decided favourably on his admission—that his father was an executioner.[63] Internal discussions within the Academy led to the decision that his initial earning of a doctorate and his subsequent publications were sufficient to qualify him for admission into the *Leopoldina*. Büchner maintained that, indeed, the disadvantage of his birth [macula nativitatis] as the son of an executioner had even been redeemed.[64] This argument acknowledged the criterion of

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[61] See Andreas Elias Büchner to Christoph Jacob Trew, Halle, 28 February 1758 (University Library of Erlangen-Nuremberg, Trew letter coll., Trew corr., no. 67), in Mücke and Schnalke 2009 (note 1), 442, lines 25–34.

[62] Ehrets *Curriculum vitae* was revised by Trew after he had submitted a copy of it. A copy in German was deposited in the archives of the *Leopoldina*. See Helene M. Kastinger Riley, 'Georg Dionys Ehrets Bisherige Lebensumstände: Die (Auto)Biographie des Gärtners, Malers und Wissenschaftlers Aemilius Macer II.', *Hoppea* 57 (1996), 511–537: 517–537.

[63] Johann Friedrich Glaser was the youngest son of Johannes Jeremias Glaser (1653–1725), an executioner in Dreißigacker and Wasungen. He studied in Erfurt, Altdorf, and Wittenberg, earning a doctorate in 1736 in Harderwijk. From 1738 he worked as a city physician in Suhl. He was admitted to the *Leopoldina* in 1759. See Johann Glenzdorf and Fritz Treichel, *Henker, Schinder und arme Sünder* (Bad Münder am Deister 1970), 2 vols., II: 352–353. Executioners had traditionally been considered "dishonest" people since the time of the Middle Ages, and their status, although regulated differently from region to region, was usually "ambivalent and unstable" and based on "changing points of view". From the seventeenth and eighteenth centuries, sons of executioners strove increasingly to enter medical professions, but frequently faced difficulties in practicing these professions as they were refused admission to the guilds. Records show that between 1680 and 1770 at least nine sons of executioners or knackers were admitted to the University of Ingolstadt. They were usually required to obtain a certificate of honesty from the count palatine. See ibid., I: 16–17, 37 and 104–112.

[64] See Andreas Elias Büchner to Christoph Jacob Trew, Halle, 26 February 1760 (University Library of Erlangen-Nuremberg, Trew letter coll., Büchner corr., no. 77), in Mücke and Schnalke 2009 (note 1), 531–532, lines 30–42.

achievement and also recognised efforts to "raise oneself from the dust of contempt by virtue of art and science".[65]

Pragmatism and Prestige

An overwhelming portion of the new members, however, failed to meet the expectations of the president; they either made no contribution to the Academy's journal or did not contribute regularly. Only 24 of the members admitted by Büchner delivered more than ten contributions to the journal; 35 published between three and five contributions; 48 delivered only one contribution, and the remaining 132 members contributed nothing at all. This inactivity aroused the displeasure of the president.[66] At the same time, rejections—such as that of an unnamed clergyman from whom Büchner had not expected a contribution to the journal—appear to have been the exception.[67]

Given the diversification of journals towards the mid-eighteenth century, it seems entirely plausible to assume that the Academy's members availed themselves of other opportunities to publish. However, this could not have been the decisive reason for the reluctance of these Academy members to publish. Membership in the Academy apparently was sought not only with a view to participation in exchanges of knowledge on medicine and natural history. From the perspective of the Academy's presidents, certain members were accepted for pragmatic and functional reasons; they were to ensure the internal organisation of the *Leopoldina* and the anchoring of the Academy in the social and political structures of the Holy Roman Empire of the German Nation. This was first the case for the administrators of the so-called Gensel Legacy, a foundation established in the Hungarian town of Oedenburg to benefit the Academy. The administrative duties involved were carried out by the respective local city physicians of Oedenburg, each of whom was made a member of the

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[65] As formulated by Johann Sebastian Albrecht, through whom Glaser submitted numerous requests to Trew, in a letter written in Coburg on 11 October 1758 (University Library of Erlangen-Nuremberg, Trew letter coll., Albrecht corr., no. 48), in Mücke and Schnalke 2009 (note 1), 529, lines 128–130.

[66] See Andreas Elias Büchner to Christoph Jacob Trew, Halle, 1 December 1756 (University Library of Erlangen-Nuremberg, Trew letter coll., Büchner corr., no. 57), in Mücke and Schnalke 2009 (note 1), 367, particularly lines 81–84.

[67] See Andreas Elias Büchner to Christoph Jacob Trew, 8 February 1768 (University Library of Erlangen-Nuremberg, Trew letter coll., Büchner corr., no. 86), in Mücke and Schnalke 2009 (note 1), 592, lines 58–62.

Academy prior to assuming this responsibility. A similar procedure was followed with several librarians at the library in Erfurt. Also to be mentioned in this context are Academy members with influential positions at the princely courts, who were to represent the Academy's interests there. Personal and court physicians in Vienna and Munich, for instance, had the responsibility of transmitting copies of the journal containing a dedication.

From the perspective of applicants, the prestige to be gained through acceptance into the "imperial" Academy was not an infrequent consideration and made striving for admission to the *Leopoldina* a worthwhile goal. This is impressively illustrated by the case of the Viennese professor of rhetoric and natural historian Johann Siegmund Valentin Popowitsch (1705–1774), who hoped that membership would give him advantages in applying for a professorship at the University of Padua, and hence pursued admission to the Academy with great persistence.[68] Despite repeated assertions of his intention to do so, Popowitsch, like many other members, never submitted a contribution to the journal. Membership in a learned society did, indeed, bring respect and prestige, as is attested also by the announcements of new members in the *Leopoldina*'s journal. These notices listed all titles and memberships held by new colleagues, which in turn enhanced the renown of the Academy.

On the other hand, Büchner as president had no measures to take against members who remained idle when it came to writing. Nor is there much evidence at all for the time of his presidency of a clearly formulated policy of admission to the Academy, with clearly stated thematic requirements and priorities, such as had been foreseen at the time of the founding fathers but which was gradually abandoned with the reformed *Leges* of 1671.[69] By the mid-eighteenth century most admissions took place instead on a random basis, whereby personal acquaintance with Academy members played a considerable role in acceptance into the learned society. The small number of applicants with no university education, in particular, were able to gain admission in this way. Among these were the

[68] On Popowitsch's admission to the *Leopoldina*, see Mücke and Schnalke 2009 (note 1), 329–332.

[69] See Leges (1755), paragraph 13 with annotations, in Büchner 1755 (note 14), 192; German translation in Müller 2008 (note 14), 257. According to the chart in Berg and Thamm 2008 (note 9), 302–303, the practice of publishing individual works in connection with the Academy programme formulated in the 1652 Leges came to a standstill at the beginning of the eighteenth century.

apothecary Johann Ambrosius Beurer,[70] already mentioned above, and the surgeon Wolfgang Jacob Müllner (1701–1779)[71]—both of whom, as highly qualified members of the class of craftsmen, worked closely with academically trained physicians and were able to take advantage of their positions in this respect to pursue admission into the *Leopoldina*. Whereas the admission of Beurer was still based on general agreement that this honour would rightly "distinguish him from his equals", as he had elevated himself above the status of other apothecaries by his scientific endeavours,[72] the admission of the surgeon Müllner in 1758 clearly illustrated both the problems and the limitations of a liberal admission policy. Although he was well acquainted with Trew, Müllner pursued his admission into the *Leopoldina* through the Nuremberg physician Ferdinand Jacob Baier (1707–1788), the son of the previous president. Büchner was not inclined against admitting Müllner, but he nevertheless asked Trew for a professional opinion.[73] He supported Müllner's request, among other things, with the argument that "suchlike *Stellae secundae magnitudinis*" had for quite some time contributed more to the journal, while a majority "of the *stellarum primae magnitudinis* . . . have disappeared, leaving us with nothing more to show than their names." Moreover, Müllner had contributed two *Observationes* composed in a better style than many of the contributions submitted by members with university degrees. Büchner's cautious

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[70] Beurer, born in Nuremberg, underwent three years of training as an apothecary in Regensburg before proceeding to deepen his knowledge first in his father's hospital dispensary and then with Caspar Neumann (1683–1737) in Berlin. Subsequently, a study trip led him to the workplaces of eminent apothecaries and physicians throughout Europe. In 1739 he took over the hospital dispensary and, alongside his professional obligations, conducted research in natural science, on which he published work also in Latin. He closely supported Christoph Jacob Trew in publishing the weekly medical journal *Commercium litterarium*. See Heinz Gossmann, *Das Collegium pharmaceuticum Norimbergense und sein Einfluß auf das Nürnbergische Medizinalwesen* (Frankfurt/M. 1966), 187–200; Wolfgang Stein (ed.), *Deutsche Apotheker-Biographie* (Stuttgart 1975–1976), 2 vols., I: 50–51; and, most recently, Mücke and Schnalke 2009 (note 1), 327–329.

[71] Müllner came from Nuremberg, where he completed training as a surgeon. Between 1718 and 1720 he participated in anatomical, surgical, and physical colleges at the University of Altdorf; in 1721 he worked for the court surgeon in Bayreuth, Teufel, and in 1722 he returned to Altdorf to attend lectures and dissections. The Nuremberg council appointed him surgeon and accoucheur. Among other things, Müllner undertook efforts to establish a school for midwives in Nuremberg. See Mücke and Schnalke 2009 (note 1), 323–326.

[72] See Christoph Jacob Trew to Andreas Elias Büchner, Nuremberg, 29/31 December 1750 (University Library of Erlangen-Nuremberg, Trew letter coll., Trew corr., no. 597), in Mücke and Schnalke 2009 (note 1), 163, lines 69–74.

[73] See Andreas Elias Büchner to Christoph Jacob Trew, 14 January 1758 (University Library of Erlangen-Nuremberg, Trew letter coll., Büchner corr., no. 65), in Mücke and Schnalke 2009 (note 1), 422–423, lines 32–47.

questioning was justified, as Trew's response revealed. In the opinion he provided, Trew stated, among other things, that the apothecary Johann Ambrosius Beurer had received an unusually high title from the magistrate of Nuremberg following his admission to the *Leopoldina*, and that this had been a cause of discord among apothecaries. In Müllner's case, Trew suspected that he would use his admission to the *Leopoldina* to his own advantage at the expense of other surgeons in Nuremberg.

Trew's objections were evidence of a deep conflict that existed at the time between surgeons and the magistrate of Nuremberg. Surgeons, who traditionally were classified as skilled craftsmen, had long been attempting to gain admission to the free imperial city *Collegium medicum*. Wolfgang Müllner, who in his early years had attended anatomical and surgical *Collegia* under Lorenz Heister (1683–1758) in Altdorf and had participated in courses taught by Henri François Le Dran (1685–1770) in Paris, was actively involved in these attempts and reported on them in a paper published in 1757.[74] According to his analysis, in 1752 surgeons in Nuremberg had directed a request about the status of surgeons to the city magistrate, who referred the matter to the *Collegium medicum*. A response was forthcoming only one year later, stating that existing regulations would remain in effect. The surgeons then addressed their concerns to the medical faculty at the University of Halle, where Büchner held the third chair. An expert report issued in 1756 favoured the surgeons' position. Moreover, Müllner was able to cite other academic physicians, including Lorenz Heister, as supporters of his position. The magistrate of Nuremberg refused to change his own position despite all the testimony of experts and third parties, while Müllner continued to pursue his aims. Acquisition of external signs of scholarship played a considerable role in this process. In 1756 Müllner issued a catalogue of his private library,[75] and one year later he had himself designated a correspondent of the Académie Royale de Chirurgie in Paris.[76] Undoubtedly his persevering efforts to achieve

[74] Wolfgang Jacob Müllner, *Samlung einiger kleinen von berühmten Ärzten vormals in lateinischer Sprache herausgegebenen Schriften … Mit Beyfügung einer merkwürdigen Responsio d. … med. Fac. zu Halle über die Frage: ob die in … Nürnberg befindl. Barbirer … unrecht gethan, dass sie sich von … Handwercks-Zünften abzusondern suchen* (Erfurt 1757).

[75] Wolfgang Jacob Müllner, *Bibliotheca Muillneriana, sive catalogus librorum quos ex omni scientiarum genere, selectos utilesque, singulari industria in vita sua collegit* (Nürnberg 1756).

[76] See letter written to Wolfgang Jacob Müllner by the secretary of the *Académie Royale de Chirurgie*, Morand, in Paris, on 3 March 1757 (Leopoldina Archives, MNr. 624, copy in Müllner's handwriting).

admission to the *Leopoldina* can be placed in this context. Trew, who had been a senior member of the Nuremberg *Collegium medicum* since 1744, disputed Müllner's professional competence and also raised doubts about his competence in Latin. But he was unable to substantiate these objections sufficiently. Büchner felt obligated to Baier and accepted Müllner for membership into the *Leopoldina*—although reluctantly and against the express opposition of Trew.

The strikingly intense and, in this respect, singular controversy surrounding the admission of the surgeon Müllner was rendered more acute not least because of the personal involvement of Büchner, on the one hand, and Trew, on the other hand. Büchner not only felt obligated to his Nuremberg colleague Baier, but also had to take a position as a member of the medical faculty at Halle, which was engaged in producing the abovementioned expert report relative to the dispute with the magistrate of Nuremberg. Trew, for his part, had an interest in resolving the conflict and maintaining the status quo within the medical community of Nuremberg. His patience was tried in the extreme, as Müllner's motive for seeking admission to the *Leopoldina* went far beyond immediate personal intentions. For Müllner, admission was not merely a matter of gaining status; he was deliberately and in a fundamental way taking aim at the established order of the medical community in the free imperial city that was his native town. Trew, on the other hand, could neither give his assent to such an obvious instrumentalisation of membership in the *Leopoldina*, nor could he imagine supporting Müllner's aims.

Conclusions

After initial difficulties, the *Academia naturae curiosorum* eventually succeeded, through comprehensive reform measures, in consolidating and establishing itself in the scholarly world as an imperially recognised society with wide-ranging privileges. This was brought about by the founding of a journal as well as by facilitation of access to membership by a broader circle of physicians and natural historians. On this basis it was possible to establish the *Leopoldina* among the medical republic of letters, embed it in social and political structures, and stabilise it for the long term. The purposeful expansion of the circle of its members rendered it less elite while it still remained exclusive. Although outstanding individual achievements by natural historians without a university education were honoured, this was not meant to be interpreted as a fundamental opening

to the non-educated classes. Admission of individual members with the status of craftsmen remained the exception. The image of the *Leopoldina* was first and foremost that of a scientific working society whose members compiled their observations and findings in a regularly published journal and also participated in the development of a library and a natural history collection. The use of Latin, owing originally to the international status of the journal, developed into a criterion of qualification and simultaneously of exclusion. The reverse side of easier access to the Academy for physicians and learned natural historians, however, became apparent in the lack of activity of a large portion of the membership, who merely benefited from the resonance of the "imperial" academy's name. While admission to the Academy held the promise of greater prestige and recognition for many members, the numerous other titles they held also reflected well on the *Leopoldina*. Given its integrative appeal to physicians who lived and worked over a wide region, the significance of the *Leopoldina* as a supra-regional and even international society that also spanned the confessional divide within Germany, in particular, should not be underestimated. The members of the *Leopoldina* constituted a network that offered them the opportunity of communication by letter over an extensive area. In this sense the mid-eighteenth-century *Leopoldina* moved between two force fields: the demand to make a scientific contribution to the well-being of humankind, on the one hand, and the need of a large portion of the membership for social advancement, prestige, and recognition, on the other hand.

JÖCHER'S ANTHROPOLOGY OF SCHOLARS

Ulrich Johannes Schneider

Scholars are complex beings who defy easy description by either biographers or bibliographers. In most cases, defining a scholar is impossible without restricting oneself to the limits of a discipline, focusing all relevant questions on one subject. But there have been attempts at a more encompassing approach. In publishing his *Allgemeines Gelehrten-Lexicon* [General Dictionary of Scholars] 1750/51 in four volumes, Christian Gottlieb Jöcher most certainly aimed for completeness in content, but he did not try to give an exact definition of what a scholar is. What he called "scholars" in his dictionary was a rather heterogeneous group, dispersed in time and space, united perhaps more by common striving for knowledge than by production of knowledge.

One must be careful in choosing the perspective from which to view a work of stupendous compilation such as the *Allgemeines Gelehrten-Lexicon* (fig. 1).[1] Does it document industrious self-indulgence? Was it an offshoot of the lust for copying, time and again, which led the author to its four-volume climax after having published three editions of a "Compendious Dictionary of Scholars" [Compendiöses Gelehrten-Lexicon] with only half the amount of text?[2] Can we detect a longing for recognition which

[1] On Christian Gottlieb Jöcher and his *Allgemeines Gelehrten-Lexicon*, see Ulrich Johannes Schneider (ed.), *Jöchers 60.000—Ein Mann, eine Mission, ein Lexikon* (Leipzig 2008).

[2] The first edition of the *Compendiöse Gelehrten-Lexicon* appeared in 1715, followed by a second edition in 1726 and a third in 1733. Jöcher's name is mentioned on the title page from the second edition onwards: *Compendiöses Gelehrten-Lexicon, darinnen Die Gelehrten aller Stände, als Fürsten und Staats-Leute, die in der Literatur erfahren, Theologi, Prediger, Juristen, Politici, Medici, Philologi, Philosophi, Historici, Linguisten, Mathematici, Scholastici, Oratores, und Poëten, so wohl männ- als weiblichen Geschlechts, welche vom Anfang der Welt grösten theils in gantz Europa bis auf ietzige Zeit gelebet, und sich durch Schrifften oder sonst der gelehrten Welt bekannt gemacht, an der Zahl über 20000. nach ihrer Geburth, Absterben, vornehmsten Schrifften, Leben, und merckwürdigsten Geschichten, aus denen glaubwürdigsten Scribenten, die man jedesmahl fleißig angemerckt, kurtz und deutlich nach Alphabetischer Ordnung beschrieben worden. Denen Liebhabern der Historie der Gelehrten, und andern curieusen Personen zu nützlichem Gebrauch zum Druck befördert. Nebst einer Vorrede Herrn D. Joh. Burchard Menckens, Königl. Poln. und Chur-Sächß. Hof-Raths und Historiographi, wie auch Histor. Prof. Publici, der Königl. Engl. Societät Socii, und des grossen Fürsten-Collegii Collegiati. Die Andere Auflage, in zwey Theile getheilet, sorgfältig übersehen,*

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Fig. 1. From 1742 until his death in 1758 Jöcher served as director of the university library in Leipzig (founded 1543), which had around 25,000 titles at the time, registered in a catalogue completed under Jöcher in 1751. Yet in his biographical dictionary, Jöcher used only 20% of the university library's holdings; the other 80% came from his private library.

the polyhistor from Leipzig thought he deserved, despite his initial studies of medicine, despite his own teaching posts in philosophy and history, and despite his doctorate in theology?[3] What do we make of the fact that his dictionary was the last of its kind in the eighteenth century?

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und mit etlichen 1000. Articuln vermehret, durch M. Christian Gottlieb Jöcher, der Heil. Schrifft Baccal. der Philos. Facultät zu Leipzig Assessorem, und des grossen Fürsten-Collegii Collegiatum. Bey Johann Friedrich Gleditschens seel. Sohn, Buchhändl. in Leipzig, im Jahr 1726. See the title *Allgemeines Gelehrten- Lexicon, Darinne die Gelehrten aller Stände sowohl männ- als weiblichen Geschlechts, welche vom Anfange der Welt bis auf jetzige Zeit gelebt, und sich der gelehrten Welt bekannt gemacht, Nach ihrer Geburt, Leben, merckwürdigen Geschichten, Absterben und Schrifften aus den glaubwürdigsten Scribenten in alphabetischer Ordnung beschrieben werden. Erster Theil A—C herausgegeben von Christian Gottlieb Jöcher, der H. Schrifft Doctore, und der Geschichte öffentlichem Lehrer auf der hohen Schule zu Leipzig. Leipzig, in Johann Friedrich Gleditschens Buchhandlung. MDCCL.*

[3] Christian Gottlieb Jöcher was born 20 July 1694 in Leipzig. His parents were Magareta (b. Ettmüller) and Johann Christoph Jöcher. A younger brother Gottfried Leonhard became a lawyer. In 1707, Jöcher was enlisted at the Rutheneum in Gera, then at the Gymnasium in Zeitz. In 1712 he enrolled at Leipzig University, where he obtained the title of Master [Magister] with his 1714 *Dissertatio de affectibus musicae in hominem*. His subsequent career in Leipzig included the following: 1717 Assessor at the Faculty of Philosophy; 1730 Professor of Philosophy; 1732 Professor of History; 1735 Doctor of Theology. Jöcher acted as rector in semesters 1737/38, 1741/42 and 1747/48. Starting in 1742, he also directed the

Jöcher's Career

From Jöcher himself we can gather only a few answers to these questions. Details of his life remain obscure; precious few facts beyond his academic career have survived. Jöcher's career was limited to Leipzig and was in itself only of secondary importance to him; he was someone who cared deeply and unconditionally about printed books and books to be printed. Jöcher not only published dictionaries, he also prefaced books,[4] initiated translations, and published funeral sermons.[5] What he did not do was to specialize in any one area of knowledge. For a long time he served as editor of a scholarly journal, the *Deutsche Acta Eruditorum*.[6] Jöcher was a general book-lover, privately collecting around 15,000 volumes that also served as the basis for his dictionaries.[7] In 1742, he became responsible for the Leipzig University Library, a position which had little effect on his work as a writer, because the University Library held very few modern books and few in languages other than Latin.[8]

Leipzig University Library, where he supervised the conclusion of a handwritten catalogue of printed books in 1751. In 1715, Jöcher started working with Johann Burckhard Mencke on the *Compendiöses Gelehrten-Lexikon*, taking sole credit for the second and third editions in 1726 and 1733. From 1719 he also joined the editorial collective of *Deutsche Acta Eruditorum*. Jöcher died on 10 May 1758.

[4] Jöcher provided prefaces to books by the following authors: Benoît Baudouin, Nicolaus Hieronymus Gundling, Lorenz Reinhard, Johann Andreas Schmidt, Cresacre More, Jean LeClerc, Dorothy Pakington, Lodovico Antonio Muratori, Augustin Calmet, Carl Gottlob Dietmann.

[5] Christian Gottlieb Jöcher, *Trauer-Reden, welche bey verschiedenen Fällen öffentlich gehalten* (Leipzig 1733); id., *Den Schatten eines schönen Bildes . . .* (Leipzig 1718) [funeral sermon for Paul Abraham König, theologian, died on 24 August 1712]; id., *Schuldiges Liebes- und Ehren-Gedächtniß Frauen Margarethen Reginen geb. Baudißin, Herrn Carlotto Rechenbergs . . . Ehe-Liebsten, welche entschlief . . . d. 30. November 1720* (Leipzig 1720).

[6] Among other works, Jöcher authored: *Disputatio effectus musicae in hominem* [Michael Ernst Ettmueller praes.; Christian Gottlieb Jöcher resp.] (Leipzig 1714); *De cura philosophi circa historias* (Leipzig 1732); *Danck-Predigt . . . zum Andencken der vor 100 J. gescheh. Stifftung des Donnerstägigen Großen Prediger-Collegii zu Leipzig 1640* (Leipzig 1740); *Ioachimi Felleri Et Christ. Gottl. Ioecheri In Academia Lipsiensi Professorum Et Bibliothecariorum Orationes De Bibliotheca Academiae Lipsiensis Paulina* (Leipzig 1744). Jöcher also edited the *Zuverlässige Nachrichten von dem gegenwärtigen Zustande, Veränderung und Wachsthum der Wissenschaften* (Leipzig 1740–1757).

[7] *Catalogus bibliothecae D. Christiani Gottlieb Ioecheri Academiae Lipsiensis . . . Professoris . . . et Bibliothecarii etc. a die V. Februarii MDCCLIX Lipsiae in Collegii Paulini aedibus a pie defuncto inhabitatis auctionis lege publice dividendae* (Leipzig 1759).

[8] Jöcher's private library contained some 15,000 books, according to the auction catalogue (see note 7). The University Library had about 25,000 books at the time, mainly older printed works, which was also the case for the Senate Library. In the final (fourth) volume of his *Allgemeines Gelehrten-Lexicon* Jöcher gives an inventory of publications that he used [Verzeichnis der Schrifften, so in dieser Ausgabe häufig gebraucht worden]. Of the

The *Allgemeines Gelehrten-Lexicon* helped Jöcher to make a transition from the closed realms of the university into the public reading cabinets and book shops. He held a position similar to the eminent Leipzig scholars Johann Christoph Gottsched und Johann Burkhard Mencke; all three were clearly attracted by the new phenomenon of the public sphere. His books communicated news from every quarter of the scholarly world to a yet undefined new audience. Jöcher excelled in a secondary form of writing, respecting the need for short texts typical of dictionaries; his texts never really treated a subject at any great length.

Jöcher's Lexicographical Art

Positively stated, Jöcher erased old distinctions and deconstructed traditional hierarchies when editing his *Allgemeines Gelehrten-Lexicon*. In it, Plato appears as one of many ancient thinkers, just as Francis Bacon appears as one of many modern ones. Jöcher did not really care for the distinction between older intellectuals and younger ones. He did not measure prudence by the criteria of chronology or geography. For Jöcher, intellectual activity was an event, something emergent, a miracle. Leaving aside most articles on theologians, many articles are devoid of any consideration of contemporaries or influential producers of theory. The *Allgemeines Gelehrten-Lexicon* opens a panorama of peculiar characters and unusual achievements:[9] The boy who already knew Greek and Latin at the age of five first incited high hopes, then died young. The beauty from Baghdad who mastered many languages and married an Italian also died very early. Her grieving husband carried her embalmed body on his travels for years; here, Jöcher seems to deplore lost talent and forgotten knowledge almost equally.

Most agreeable to Jöcher are the not so professional thinkers. He does not even care whether the heroes and heroines in his dictionary could

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318 titles, about 60 per cent are in Latin, 20 per cent in German, and 10 per cent in French, together with miscellaneous other languages, mostly Italian and English. A sample of 50 listed sources shows 15 then in the University Library (according to the catalogue of 1751), 25 others Jöcher owned privately. He may have found the rest elsewhere in Leipzig.

[9] In the course of preparing the exhibition and the catalogue "Jöchers 60,000" (see note 1), all articles in the *Allgemeines Gelehrten-Lexicon* were checked by a group of students. Even though some articles turned out to be mere bibliographies (mostly in the realm of theology), most insisted on biographical details, which also becomes apparent when they are compared with source material that has been edited and shortened.

write or leave written traces. He enjoys reporting mythological or fantastic tales about great minds. Jöcher welcomes them all: Mani Giorida Sitti who could not write, and Anna d'Osoria who did not want to write, as well as Aemilius Ferreti, who burned his writings. Jöcher has an article on Adam in his dictionary and even discusses the question whether the first man wrote a book about animals. He includes Brutus who was a learned man and of whom we now know little more than that he murdered Caesar.[10]

Seen from the margins of scholarly activities, the nature of Jöcher's endeavour eventually becomes clear: he was looking for the effort and the passions surrounding knowledge. In the past and in the present, he searched for book miners and fans of scripture, for readers who could not stop and the curious who are never satisfied. Jöcher creates types, and he does so within the limits of a dictionary, often forced to admit that his sources are dubious. Yet he never leaves out information that could be used to typify somebody, even if it is clearly wrong or contradictory. He reports the gruesome death of Euripides, the Greek dramatist, in a way that defies our comprehension: The poet was ripped apart, he writes, either by hounds or by women. Today, we are unable to make sense of such mindless repetition of obviously corrupt sources, and one wishes for a critical scholar like Pierre Bayle, who in his *Historical and Critical Dictionary*—a work translated in Jöcher's time in Leipzig into German—reports the death of Euripides, but not without commenting upon the quality of the sources.[11]

Nothing of the sort occurs in Jöcher's writing. The modern reader feels drawn into the text half by entertainment, half by endless astonishment. This afflicts the text with a good deal of misunderstanding. Of course it is entertaining to read that Senecio—a rarely mentioned and perhaps invented figure in ancient Latin texts—insisted on having everything big in size: "His servants, his silverware, his clothing, his meals—everything had to be big. His mistress was quite tall, too."[12] What does this mean?

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[10] *Allgemeines Gelehrten-Lexicon*, vol. 1, col. 1438: "Ein Redner und Philosophus, welcher den Jul. Cäsarem A.V.C. 710 ermordet. Er folgte der Secte der Stoicerum, und schrieb einen Auszug der römischen Historie . . . und andere Schrifften, so verlohren gegangen, doch sind noch unter seinem Nahmen 35 Episteln vorhanden, welche aber nicht vor genuin wollen gehalten werden."

[11] Cf. *Allgemeines Gelehrten-Lexicon*, vol. 2, col. 439, and Pierre Bayle, *Historisches und Critisches Wörterbuch, mit einer Vorrede und verschiedenen Anmerkungen versehen von Johann Christoph Gottsched, nach der neuesten Auflage ins Deutsche übersetzt* (reprint of Leipzig 1741-1744 edn., Hildesheim 1997), 4 vols., II: 426.

[12] *Allgemeines Gelehrten-Lexicon*, vol. 4, col. 503: "Senecio, ein alter Redner, mit dem Zunahmen Grandio, war von so wunderlicher Art, daß er alles groß haben wollte. Er redete

Jöcher keeps silent, providing no explanations, only communicating what he finds, forever manipulating his sources to make them sound enigmatic and shrill. His lexicographical art consisted in cancelling text or making it extremely brief, as can be clearly seen in his articles on Giordano Bruno and Julius Caesar Scaliger compared with the respective biographical entries in Johann Heinrich Zedler's *Universal-Lexicon* published slightly earlier.[13] Although Jöcher's dictionary specializes in biographies, its 60,000 articles do not convey all available information; far from it.

An Imaginary Family

What Jöcher consistently omits are the stages in individual development that would give readers a better understanding of his subjects. What he retains, and by his policy of omission underscores, are peculiarities and idiosyncrasies, accidents, illnesses, conflicts and other extraordinary happenings. There is most likely a link between the passion Jöcher himself was famous for when delivering funeral sermons—late signs of a Protestant culture at the open grave then already in decay—and the fascination visible in his dictionary for ways of departing from the world. When preaching, Jöcher acted according to the motto "Our whole life is an art of dying".[14] In the dictionary, he provides examples showing how difficult it can be to enact that motto. The tragic ending of Johann Faust is described in detail ("bashed against the wall to make his brain stick to it") and the deadly fall from a balcony of the Leipzig scholar Joachim Feller is noted dryly. There are dramatic descriptions of the death of the Roman writer Boethius after torture and of the Indian Calanus. In many other articles death is reported with a subtext of baroque horror. Rare indeed are phrases telling us that someone died "unnoticed" as in the case of Faber Stapulensis.[15] What we read between the lines is this: It is difficult to lead a productive life, and almost impossible to work intellectually, since death is ever present, never really announced, mostly hard and sudden, and abruptly ends a life lacking order and consideration.

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lauter prächtige Worte. Seine Knechte, sein Silber-Geschirr, seine Kleidung, seine Speisen musten alle groß seyn. Er hielt sich auch eine Maitresse von ungemeiner Länge."

[13] *Allgemeines Gelehrten-Lexicon*, vol. 1, col. 1434 (Bruno) and vol. 4, col. 191–193 (Scaliger); Johann Heinrich Zedler, *Großes vollständiges Universal-Lexicon* (Leipzig and Halle 1732–1754), 68 vols., IV: col. 1651–1653 (Brunus) and XXXIV: col. 511–513 (Scaliger).

[14] Jöcher 1733 (note 5), 245.

[15] Cf. *Allgemeines Gelehrten-Lexicon*, vol. 1, col. 1182 (Boethius) and col. 1555 (Calanus), vol. 2, col. 436f. (Faber Stapulensis), col. 531 (Faust) and col. 554 (Feller).

This interest in the typical, the accidental and the astonishing in Jöcher's dictionary is probably also the cause for its failure to cite proper references, either for the works quoted or for writings about the person in question. Life and death seem much more important than tradition and survival. The bibliographer who takes care to provide precise references loses out against the historian of scholarly anthropology. There is never any mention of the works and their actual merit. So the dictionary can best be understood as a giant cemetery. Whereas Karl Günter Ludovici, a professor and colleague of Jöcher, included biographies of living people when he took over the position of editor of Zedler's *Universal-Lexicon* in 1737, Jöcher continued in the vein of his three editions of the *Compendiöses Gelehrten-Lexicon*, sticking to the dead.[16] Among the recently deceased we find the scientist Johann Bernoulli, who died in 1747, and the teacher Heinrich Bernhard Küster, who died in 1749.[17]

From the more or less contemporary figures in his dictionary, Jöcher builds his own imaginary family. This family also bore the name of an academy: an illustrious society of people who stopped short of achieving eternal life, regaining an existence of some sort through Jöcher. The academy is conjured up, its performance is directed without assigning fixed topics. What is fixed, on the other hand, is the individual life. Jöcher focused on biographical detail, while at the same time the historian of philosophy, Johann Jakob Brucker in Augsburg, worked hard to exclude just this kind of traditional knowledge from philosophy, which for him had its reality in propositions and theses.[18] Jöcher's academy was composed of unrelated individuals, and even when a eulogy for someone is quoted, there is never any cross reference to the person being praised.

The enormous amount of work in putting together the dictionary effectively isolates the members of the academy from one another, not linking them with each other. We still have a few copies of Jöcher's dictionary written into by their owners, documenting the very hard work of getting the entries right.[19] What Jöcher provides in terms of connections

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[16] Cf. Ulrich Johannes Schneider, 'Zedlers *Universal-Lexicon* und die Gelehrtenkultur des 18. Jahrhunderts', in Detlef Döring and Hanspeter Marti (eds.), *Die Universität Leipzig und ihr gelehrtes Umfeld 1680–1780* (Basel 2004), 195–213.

[17] Cf. *Allgemeines Gelehrten-Lexicon*, vol. 2, col. 1025–1027 (Bernoulli) and vol. 2, col. 2178 (Küster).

[18] Cf. Ulrich Johannes Schneider, 'Das Eklektizismus-Problem der Philosophiegeschichte', in Theo Stammen and Wilhelm Schmidt-Biggemann (eds.), *Johann Jakob Brucker (1696–1770). Philosoph und Historiker der europäischen Aufklärung* (Berlin 1998), 135–158.

[19] Leipzig University Library has two handwritten documents that bear witness to the continuation of work done on dictionaries by Jöcher. There is a copy of the third edition

between his entries can be regarded as a dialogue, yet it is not one that the reader can detect easily. Rather, the dictionary appears to assemble a series of excerpts taken from books—most likely to be found in Jöcher's private library—and display them without bothering to connect the dots. If tradition is a carpet, it is single threads that prevail here. Put differently: Jöcher highlights the individual scholar and underlines individual achievements.

Jöcher's Competitors

Jöcher's *Allgemeines Gelehrten-Lexicon* figures at the end of a story which started in the sixteenth century in the context of Protestant culture, when Nicolaus Reusner and later Paul Freher, made intellectual life accessible through biographies.[20] Contemporaries of the Reformation and the Early Enlightenment were made acquainted with spiritual heroes of their own time as well as from the past. Dictionaries of scholars were a considerable part of overall book production early on, offering such ideological identification. Other, more broadly designed biographical dictionaries like Louis Moréri's *Dictionnaire historique* (which appeared in one volume in 1674 and was reedited many times until a final ten-volume set appeared in 1759),[21] extended coverage of all distinguished Europeans. Moréri joined scholars and noblemen as well as ancient and modern figures, and political and ecclesiastical dignitaries (also mixing, in later editions, Catholics and Protestants). Moréri's dictionary was strictly historically oriented, while Jöcher's guidelines seem to have been more anthropological at the core, providing more often than not scenes of disputes between intellectuals. With Jöcher, thinkers and poets are presented in a way that shows the scars of earthly combat in their biographical accounts; they are portrayed as fighting off all kinds of dangers arising from the world they live in, from their very families, from illnesses, etc. Again and again an undisturbed life of the spirit and a calm environment for intellectual work must be established against numerous odds.

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of the *Compendiöses Gelehrten-Lexicon* (1733) (UBL: Litg.29–l), annotated by Karl Friedrich Aichinger (1717–1782, city preacher and school inspector in Sulzbach), and extensive comments and additions to the *Allgemeines Gelehrten-Lexicon* by Heinrich Wilhelm Rotermund (1761–1848, cathedral preacher in Bremen) (UBL: Litg. 120–ba).

[20] Niklaus Reusner, *Icones sive imagines virorum literis illustrium* (Argentorati 1587); Paul Freher, *Theatrum virorum eruditione clarorum* (Noribergae 1688).

[21] Louis Moréri, *Le grand dictionaire historique ou le mélange curieux de l'histoire sacrée et profane* (Lyon 1681).

We can compare Jöcher's lexicographical work with other universal dictionaries of his time, such as the *Conversations-Lexicon*, published by Jöcher's publisher Gleditsch, which had already gone through eight editions by the middle of the eighteenth century,[22] or the *Universal-Lexicon* by competing publisher Johann Heinrich Zedler, who finished the alphabet with the 64th volume in 1751. There is also Ephraim Chamber's *Cyclopedia*, the second edition of which in 1750 displayed considerably more care in dealing with historical knowledge than Jöcher.[23] This is even more true of the French *Encyclopédie* published by Denis Diderot and Jean le Rond d'Alembert from 1751, the same year that Jöcher published the final volumes of his *Allgemeines Gelehrten-Lexicon*, announcing in the preface that he did not plan to produce any more dictionaries or editions thereof.[24]

What the readership of the eighteenth century was offered fills big libraries today. For contemporaries, there were quite a few repetitions in reading about the life and work of authors. Most likely, Jöcher's originality consisted in his choice and the space he accorded to each entry, as well as biographical accentuation of the articles. Later dictionaries of similar design, like the *Gelehrte Teutschland* by Georg Christoph Hamberger,[25] were more concerned with the reliability of the biographical information, much like the emerging type known as "Konversationslexika", which strove to be professional news brokers: What readers were interested in was achievement of some sort; everything else counted as literature.

This analysis allows us to conclude that Jöcher's dictionary stays within the literary genre. His many stories about strange ways of dying relate directly to the crime stories of Pitaval,[26] even if the end of the life of a scholar did not always imply a crime. As mentioned earlier, Jöcher's obsession with death is also evident in his funeral sermons [Trauerreden], where death becomes an abstract force. Jöcher may have been looking for an explanation for the great mystery of how intellectual activity ends

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[22] *Reales Staats-Zeitungs- und Conversations-Lexicon* (Leipzig 1744).

[23] *Cyclopaedia: or, an Universal Dictionary of Arts and Sciences* (London 1750), 2 vols.

[24] See preface, unpaginated: "Ich wiederhole übrigens mein ehemals gethanes doppeltes Versprechen: einmal daß dieses Werck bey meinem Leben nicht wieder solle gedruckt werden . . . nebst diesem aber, daß ich die zu gegenwärtigem Lexico nöthigen Ergänzungen, Verbesserungen und Zusätze in besonderen Supplementen gewiß liefern . . . werde." [Moreover, I repeat the dual promise that I have already made: that this work will not be published again in my lifetime, and that I will certainly make necessary improvements and additions, in special supplements, to the present Lexico.] This did not take place.

[25] Georg Christoph Hamberger, *Das gelehrte Teutschland, oder Lexicon der jeztlebenden teutschen Schriftsteller* (Lemgo 1767ff.).

[26] Francois Gayot de Pitaval, *Causes celebres et interessantes, avec les jugemens qui les ont decidées* (Paris 1734–1743), 20 vols.

at all. In his sermons he uses rather simplistic rhetoric, overblown metaphors, exaggerated phrases and clumsy dramatization: "The grave and the coffin cover the bodies of the deceased, yet their fame penetrates the earth. While their flesh disintegrates to ashes, and mould grows on their bones, the memory of their good life will never go away."[27] This means that the great family of human lives as presented in the dictionary is collectively doomed to die, prone to a senseless death, confronted with the sudden disappearance of all forces.

The Dictionary as a Family Vault

This may have comforted Jöch er, who was an ever-changing scholar, always at work, with no family, seeking instead a collectivity of like-minded and similarly doomed men and women. But this is speculation. Today we certainly lack the sense of closeness and proximity provided by a biographical sketch in edited books that was felt by the eighteenth-century scholarly community. We also most likely lack the imagination to directly compare thinkers of our own time with intellectual giants from ancient times or the Middle Ages. Most of all, we have no sense of the eighteenth-century feeling of how fragile the relation of body and mind was and how this will forever limit our knowledge.

If we imagine a world where there is no death and every scholar is still alive, it would resemble an academy of the undead, giving a voice to all knowledge at all times in an instant, or rather many voices at the same time: Bablyon. In this vision, we would be open to the future, thanks to a continuous past, but we would have difficulties in making ourselves heard simply because of the infinity of voices already speaking. Jöcher's work can be understood as denying such a vision. When he reconstructs intellectual life from the perspective of ever-occurring death, he intends to silence this cacophony of simultaneous discourses. His *Allgemeines Gelehrten-Lexicon* relocates every discourse to a person and finds for every person an individual history, including, if possible, an interesting way of dying. Historical knowledge edited in this fashion both fills and reflects the limitations of a book. The dictionary becomes a family vault in which mainly the voice of the editor resonates, strangely animated by the many deaths it reports.

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[27] Jöcher 1733 (note 5), 43: "Gruft und Sarg bedecken die Glieder derer Erblassten: Aber der Ruhm ihrer Tugenden dringt durch Grab und Erde; und wenn die Fäulnis längst ihr Fleisch in Asche verwandelt, oder der Moder ihre Gebeine befleckt, so grünt das Andenken ihres wohlgeführten Wandels noch unverweslich."

ON SOME SOCIAL CHARACTERISTICS OF THE EIGHTEENTH-CENTURY BOTANISTS

René Sigrist*

In the eighteenth century, the systematic study of plants was already an old story that could be traced back to the Renaissance and even to classical antiquity. Yet the existence of botany as a science independent of medicine was not as old. It would be difficult to ascertain to what extent it was already a discipline practised by specialized scholars—not to mention professionals.[1] In 1751 Linné, in his *Philosophia botanica*, had tried to define the aims and the ideal organisation of such a discipline. Yet, despite the many students who came to hear him in Uppsala, and his eminent position within the Republic of Letters, it was not in his power to impose professional standards on other botanists. Diverging conceptions of the science of plants persisted at least until the final triumph of Jussieu's natural method of classification, in the early nineteenth century. The emergence of the professional botanist would be a still longer process, with important differences from one country to another. The present article aims to analyse the social status of botanists in the eighteenth century and in the early nineteenth century, a period which can be characterised as the golden age of scientific academies.[2] Starting with Linné's conception of the division of tasks within the community of phytologues, it focuses on the social perception of botanists, on the structure of epistolary links within the Republic of Botanists, and finally on the professional activities and social origins of the major contributors to the science of

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[1] In the opinion of Roger L. Williams, *Botanophilia in Eighteenth-Century France. The Spirit of Enlightenment* (Dordrecht 2001), 4, botany did not become an independent science before the eighteenth century. He considers (9) that an important quantum jump occurred in 1717 when Sébastien Vaillant positively asserted the sexual character of plants, which had already been foreseen by Camerarius in 1694, but denied by Tournefort the very same year. Another step was the eager adoption by the young Linné of Vaillant's position as the founding principle of his own system of classification.

[2] For the sake of brevity of the term "eighteenth century" will be used in this article, although its empirical basis is extended to the period from 1700 to 1830.

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plants. The dynamic evolution of the community of botanists will also be analysed as a result of growing social demands, and as a condition for a slow process of professionalisation.

Linné and the Organization of a Discipline

Thanks to the support of Queen Louisa Ulrika and the cooperation of the Swedish East India Company, Linné was in a position to finance travellers who allowed him to extend his investigations to the world's flora and fauna, so as to gather an unprecedented number of specimens and proxy pictures in the gardens and the library of Uppsala. He was thus in a position to set up an ambitious program of study which served as a model for at least one generation of botanists and marked a kind of turning point in the emergence of botany as a discipline.[3] From the sixteenth century onwards, botany had been taught and practised as an auxiliary science of medicine, so that botanical gardens were mainly concerned with the growing of "simples", that is of medicinal plants or herbs. In 1694, Tournefort still defined botany as knowledge of plants and their (medicinal) virtues.[4] Boerhaave, whose influence on the teaching and practice of botany was without equivalent in the early eighteenth century, still conceived of botany as first dedicated to the study of the curative and nutritive properties of simples. His disciples took up his ideas and spread them to Germany (Haller, Trew, Heister), Britain (Sherard), Switzerland (Haller again, Gessner), Austria (de Haen) and of course the Netherlands (Burman, Gronovius). Linné himself, although not one of his direct students, came under his influence.

In the development of botany as an autonomous discipline, Linné's role was probably without equivalent, except for the French school of natural classification, centred around the Jussieus, and the institutional settings offered by the Jardin du Roi, the Paris Académie des Sciences, and the Medical Faculty of Montpellier.[5] The inventor of the sexual

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[3] See Gunnar Eriksson, 'The Botanical Success of Linnaeus. The Aspect of Organization and Publicity', in Gunnar Broberg (ed.), *Linnaeus: Progress and Prospects in Linnaean Research* (Stockholm 1980), 57–66; Tore Frängsmyr (ed.), *Linnaeus. The Man and His Work* (Canton 1993).

[4] "La botanique . . . a deux parties . . .: la connaissance des plantes et celles de leurs vertus". Joseph Pitton de Tournefort, *Eléments de botanique ou méthode pour connaître les plantes* (1694), reissued by Nicolas Jolyclerc (Paris 1797), 45–46.

[5] See Alan G. Morton, *History of Botanical Science. An Account of the Development of Botany from Ancient Times to the Present Day* (London 1981).

system of classification outlined his concept of botany in his *Philosophia botanica*. His science of "growing and living beings" was part of a natural science which considered natural beings, whether mineral, vegetal or animal, as composed entities assembled by God's will. Its object was to name plants according to their genres and species, with the further aim of characterizing their relations to other types of beings, in order to study the influence of climate and culture and to discover the general laws of their generation.[6] Its discoveries, revolutions, progress and methods were established in a series of books published for the most part since 1530: the *Bibliotheca botanica*. Among the 159 main contributors to the *Bibliotheca*, only three (Theophrastus, Pliny and Dioscorides) lived in antiquity and two others in the fifteenth century.[7] They were therefore excluded from the list of the "founding fathers" of botany, as they belonged to Greek and Roman antiquity or to the Western and Arabic Middle Ages, along with a plethora of their mediaeval and renascent commentators. In the eyes of the "prince of botanists", members of these groups were ignorant of the two basic principles of modern botany, i.e. the art of general description and the canons and laws which rule the science of the plant kingdom. Linné gave further precision to his concept of the botanist in the form of a taxonomy of phytologues, whose first division opposed real botanists and mere botanophiles.

Linné then split the real botanists into two kinds: 1) the *collectors*, whose duty is to produce and formalize empirical data, and 2) the *methodists*, who classify and denominate plants on the basis of the data prepared by the collectors.

1. Among the collectors, Linné first mentions the group of *iconographs*, who produce figures of plants. This art, ignored by the ancients, is a fundamental tool for the elaboration of empirical knowledge, which requires the circulation of proxy pictures.[8] Yet, since figures only give indications about plant morphology, the iconographs' work has to be completed by the general descriptions provided by *descriptors*, whose crucial role, also ignored by the ancients, is to characterize the plants' features (shape,

[6] On Linné's concept of botany, see Staffan Müller-Wille, *Botanik und weltweiter Handel. Zur Begründung eines natürlichen Systems der Pflanzen durch Carl von Linné (1707–1778)* (Berlin 1999), 105–132. Before the *Philosophia botanica* (1751), the basic principles of the Linnean method had been published in the *Fundamenta botanica* (1735) and in the *Genera Plantarum* (first edition 1737).

[7] Caroli Linnaei, *Philosophia botanica* (Stockholmiae 1751), 3–5 (§ 6).

[8] Among the most famous iconographs are Anders Hesselius, Johannes Hieronymus Kniphof and Georg Dionysius Ehret, who worked on Linné's *Hortius Cliffortianus* (1737).

texture, smell, taste, colour) in a standardized language. Linné considers as descriptors such early botanists as Johannes and Caspar Bauhin, but also Dillenius for the mosses, Sloane and Plumier for the American species, and Georg Eberhard Rumpf for the Indian plants. Some of them, the *monographs*, specialized in a single genre of vegetable (such as the Ginseng for Jacob Breynius). Others, called the *inquisitives*, focused their attention on rare plants.[9]

Among the collectors, Linné also ranks the *adonides*, who teach botany on the basis of the specimens gathered in a garden. Among the most famous of these were Pierre Magnol in Montpellier, Hermann Boerhaave and Adrianus van Royen in Leyden, Albrecht von Haller in Göttingen, Linné in Uppsala, and Michelangelo Tilli in Pisa. Then there are the *florists*, who make a methodical inventory of plants growing *ex tempore* in a place, usually a province, sometimes a botanical garden. Their aim is to complete the pharmacological teaching of medical students by the adonides.[10] Finally, the *travellers* observe and collect the vegetable products of foreign countries. Their investigations, usually financed by governments and supervised by academies, go far beyond the medical context of most of the botanic gardens.[11]

2. Botanists of the second type, called "methodists", are subdivided into philosophers, systematicians and lexicologues.

The *philosophers*' duty is elaboration of the theory of botany on the basis of principles, reasoning and experimentation. Their axioms, rules and conclusions are designed to frame the work of the systematicians. Among them, the *physiologues* have the crucial task of looking for the laws of vegetation.[12] Yet Linné only considers as such the few scholars who have discovered the secret of plant sexuality: Sébastien Vaillant, Rudolph Jakob Camerer and Johan Gustaf Wahlbom. Curiously, Duhamel du Monceau is ignored, whereas Stephen Hales is relegated to the ranks of ordinary botanophiles. On the theoretical basis established by the phyiologues, the *institutores* like Joachim Jungius, Christian Gottlieb Ludwig or

[9] Examples include Jan Commelin (for the rarities of the garden of Amsterdam), Johannes Christian Buxbaum (for oriental plants) or Johannes Ammann (for Russian *Ruthenicae*).

[10] Linné ranks among the florists Johann Gottsched for his *Flora Prussica*, Heinrich Bernhard Ruppius for his *Flora Ienaensis*, and Thomas François Dalibard for his *Flora Parisiensis*.

[11] Among the travellers are Louis Feuillée for the plants of Peru, Johann Scheuchzer for the Alpine plants, and Johann Georg Gmelin for the plants of Siberia.

[12] Müller-Wille 1999 (note 6), 178–179.

Linné himself, can formulate and teach the rules and precepts required by the systematicians. Less useful kinds of philosophers are the *orators* like Lelio Trionfetti, Caspar Commelin and Gottlieb Friedrich Mylius, who compose ornamental discourses on botany, or the *eristicae*, who indulge in polemics.[13]

The *systematicians* are supposed to distribute the plants between the different orders or phalanx of a system of classification to conform to the principles established by the philosophers to apply to the descriptions made by the collectors. They are "orthodox" if their system is based, like Linné's, on the sexual organs of plants or on parts of them: the fruits (Ray, Hermann, Boerhaave), the corolla (Tournefort, Plumier, Pontedera, Rivinus, Heucher, Hebenstreit, Ludwig, Knaut), or the calyx (Magnol).[14] They are "heterodox" if they classify vegetables according to principles other than the parts concerned with fructification: the roots, the leaves, the general aspect, the time of flowering, the place of origin, the medical uses, the pharmacopoeia or even the alphabet.

A last group of methodists, the *lexicologues*, are attached to the study of plant names. They can focus their investigations on synonymy (Caspar Bauhin, Haller), on lexicography, or on etymology, or compare the designations used in different languages (Mentzel).

Beyond the true botanists are the *botanophiles*, a large group in which figure the gardeners, the physicians, the anatomists and the authors of miscellaneous writings. The exclusion of the *gardeners* from the "Respublica botanici"[15] can be explained by the subordinate status given by Linné to all those who do not contribute to the classification and denomination of plants. Even if some of the eighteenth-century gardeners such as

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[13] To this category Linné relegates Pierre Jean Baptiste Chomel, August Quirinus Bachmann (Rivinus), Johann Jakob Dillenius, Johannes Browall and Johann Georg Siegesbeck, the latter being probably the fiercest opponent to his sexual system of classification. But he ignores Buffon, who did not think it is possible to establish a universal method to classify plants. See 'De la manière d'étudier et de traiter l'histoire naturelle', *Histoire naturelle* I (1749).

[14] These are considered as "partially orthodox" botanists who have applied sexual methods to one single class of vegetables: the composites (Vaillant), the umbels (Morison, Artedi), the grasses (Monti, Scheuchzer, Micheli) or the funghi (Dillenius).

[15] According to his taxonomic priorities, Linné conceived the idea of a Republic of Botanists as a place where names of plants would be discussed. In a letter to Haller dated 8 June 1737, he expressed the wish that in a free Republic of Botanists [in libera republica Botanici], unending names of plants would no longer be accepted for the reason that they were sanctioned by an old practice or tradition. See *The Linnaean Correspondence*, an electronic edition prepared by Eva Nyström and the Swedish Linnaeus Society, Uppsala, and published by the Centre international d'étude du XVIII^{e} siècle (Ferney-Voltaire).

Richard Bradley or Joseph Miller had a good knowledge plants, most of their colleagues were seen by Linné as exclusively interested in flowers, aromatic plants and useful species of the most common kind, a commercial bent which made their knowledge of little value to the botanist.[16]

The diminishing of *physicians* to the status of mere amateurs reveals Linné's obvious desire to underline the autonomy of botany vis-à-vis medicine. Among the great number of physicians who studied the medical properties of plants, he itemizes seven schools or sects. Among them are the *chemists* who try to analyse the properties of plants through the use of fire. Staffan Müller-Wille has shown that Linné was thinking of the experiments undertaken in the late seventeenth century by the Paris academicians of science to isolate the constituent parts of plants (oil, spirits, phlegm, salt earth) in order to identify their active principles.[17] Unfortunately, plants with the same components sometimes have different virtues.[18]

The inclusion of the *anatomists* in this subordinate category of botanophiles, even major ones such as Malpighi, Grew, Hales, Gessner or Ludwig, can appear more surprising, although it apparently obeys the same logic of disciplinary assertion of botany. Another explanation is that anatomists, who focus their investigations on the material and structural composition of plants in general, and on the links between the properties and the function of their parts, were not peculiarly interested in classification or in the study of particular species.[19]

On the whole, Linné's characterization of various categories of botanists, based on their expected intellectual contribution to the science of classification and denominations, was obviously prescriptive rather than descriptive. The greater botanists such as Ray, Tournefort, Vaillant, Dillenius, Linné or Haller all practiced a more comprehensive kind of natural science, which easily transcended these limited specialities.[20] Because he

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[16] Müller-Wille 1999 (note 6), 146–148.

[17] Ibid., 139–143. Linné also refers explicitly to Tournefort, Chomel and Cl.J. Geoffroy, who belonged to a younger generation.

[18] As a more general rule, chemists made the mistake of considering the plants only in terms of their material constituents, whereas a plant is a living being of a particular kind, whose specificity is destroyed by chemical analysis.

[19] Müller-Wille 1999 (note 6), 151–153.

[20] According to Linné, Haller was a versatile *collector*, being at the same time a *florist* who made a census of the native plants of Switzerland, a *monograph* who described some new alpine plants, an *adonide* because of his professorial duties in Göttingen, and a *traveller* who studied the rare plants of Switzerland. He was also a *methodist*, that is a *lexicologue* studying ancient names of plants and even a *botanophile* based on the remarks

restricted botany to the classification and denomination of plants, Linné saw the practical and technical sides of the study of vegetables as subordinate tasks[21] and more or less ignored the "physical" tradition of Duhamel du Monceau. Nevertheless, his quest for a stable and rational classification which could be considered as natural was an important step in the establishment of an autonomous science of plants. To establish this new science, Linné and other botanists sought the support of monarchs and trading companies. To mobilize disciples, travellers, scholars and even go-betweens, they also counted on the ideals and networks of the Republic of Letters. Yet various testimonies indicate that specialization and professionalisation were still remote perspectives in the middle of the eighteenth century. And if the science of botany was clearly perceived, the botanists' identity remained uncertain.

Scholars and Botanists: A Lexical Survey of Perceptions

In 1749, Nathan Bailey's *Etymological Dictionary* still defined the botanist as "an herbalist, or one skilful in herbs" and botany (or botanicks) as the "science of simples, which shows how to distinguish the several kinds of plants".[22] Between the lines, these references to herbs and "simples", point to the traditional association of botany and medicine required by pharmacology ("res herbaria" or "materia medica"). Another feature of the time was the frequent use of the word "botany" compared to that of "botanist". A brief survey of the current literature in English, French and German shows that in the first half of the eighteenth century, references to the science itself were about 30 to 50 times more frequent than references to

about the use of plants he included in his *Synopsis Helvetica*. On Haller's botanical work, see Luc Lienhard, 'La machine botanique: Zur Entstehung von Hallers Flora der Schweiz', in Martin Stuber, Stefan Hächler, Luc Lienhard (eds.), *Hallers Netz. Ein Europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005), 371–410; Jean-Marc Drouin and Luc Lienhard, 'Botanik', in Hubert Steinke, Urs Boschung, Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008), 292–324.

[21] See Müller-Wille 1999 (note 6), 157.

[22] Nathan Bailey, *An Universal Etymological English Dictionary* (London 1749). There is also an entry for "Botanology" ("description of herbs and plants") and another for "Botanical" or "Botanick" ("belonging to herbs and plants"). Although based upon the Greek word for plant (botane), the word "botany", used to describe the science of plants, apparently dated from the second part of the seventeenth century. See Williams 2001 (note 1), 4. Müller-Wille 1999 (note 6), 138 considers Tournefort and Boerhaave as the authors of the first recorded definitions of the word.

those who practised it.[23] Between 1750 and 1780, the word "botany" (and its equivalents in French and German) still appeared eight to 20 times more frequently than "botanist". Between 1780 and 1800, they appeared only two to eight times more frequently. And in the first three decades of the nineteenth century, the difference was further reduced, the word "botany" being only two to three times more frequent than "botanist". Whatever the imprecisions of the method, this lexical emergence is significant for the intellectual and social affirmation of the botanist in the late eighteenth century and the early nineteenth century. Similar tendencies can be observed for the chemist, the astronomer and the geographer, and somewhat later for the naturalist, the geologist, the mineralogist, the anatomist and the physiologist: all these new specialists gradually rejoined the mathematician and geometer among the full-fledged figures of scientific scholarship. By contrast, the early eighteenth-century writers fancied the more general terms of scholars, philosophers or even travellers, often with the additional qualification of "learned". Professional designations such as physician, vicar or fellow also frequently applied to botanists. In France as well, the word "botaniste" most often remained confined to a few obituaries[24] and to some specialized articles.[25] Even then, when La Condamine referred to the famous Joseph de Jussieu in a memoir on the cinchona (1737), he chose to introduce him by the title of "Medical Doctor of the Paris Faculty" and the qualification of "brother to the two academicians Antoine and Bernard de Jussieu".

If English botanists were often perceived as learned gentlemen, they frequently appeared in France as "academician" and in Germany as "Professor". In 1699, the Paris Académie des Sciences had established six positions of "pensionnaires" for botanists.[26] The title of "botaniste du roi" was

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[23] These comparisons were made in October 2008 by browsing the available texts on books.google.com.

[24] An example of an occurrence found in the *Bibliothèque anglaise ou Histoire littéraire de la Grande-Bretagne* 3/I, 553 for 1718: "La mort vient de nous enlever Mr Petiver, fameux Botaniste de Londres et membre de la Société Royale".

[25] Example taken from La Condamine's memoir *Sur l'arbre du Quinquina* [dated 29 May 1737]: "Loxa, où non seulement le quinquina, mais un très grand nombre de plantes rares et inconnues … offrent une riche récolte à la curiosité d'un Botaniste". See *Suite des Mémoires de Mathématiques et de Physique tirés des registres de l'Académie royale des Sciences de l'année 1738* (Amsterdam 1737), 319–320.

[26] The elected few were Denis Dodart, Jean Marchant, Joseph Pitton de Tournefort, Claude Burlet, Morin de Saint-Victor and Michel-Louis Reneaume. A few botanists such as Nicolas Marchant (since 1666), Denis Dodart (since 1673), Jean Marchant (since 1678) and Tournefort (since 1691) had already figured among the first members of the Paris Académie des Sciences.

also conferred on individuals such as Charles Plumier (1646–1704), who received this honour on his return from an expedition to the West Indies (1691).[27] Significantly, he had not studied botany, or even medicine, but philosophy, then mathematics, mechanics and optics, before becoming a regular priest in the religious order of the Minimes. He also received some instruction in painting and sculpture, as well as in the art of the turner. Plumier's interest in plants was awakened by a stay in Rome, where he met the great Italian botanists Francesco Onophrüs and Silvio Boccone. He then had the opportunity to herborize in the Alps with Tournefort and with various local scholars, before becoming a member of an expedition sent by Louis XIV to the West Indies with the particular task of studying the flora. Back in France, the king honoured him with the title of royal botanist and a pension, before sending him back to America (1693 and 1695). Plumier's publications about American flora would bring honour to his new title,[28] although his attention was sometimes diverted by other topics.[29] By the late seventeenth century, botany was indeed seldom an exclusive career and this feature would last for most of the eighteenth century. For England, David E. Allen considers the engagement of Dillenius by William Sherard (1721) as the first case of full-time paid expertise in the field of botany.[30] It was 14 years before the engagement of Linné at Clifford in the Netherlands.

In a few cases, the botanists had their identity formally established by the delivery of a royal title or by nomination as the correspondent of a scientific Academy.[31] Most often, their scholarly dignity was conferred in an informal way by other members of the Republic of Letters. The case of Haller, analysed by Luc Lienhard and Stefan Hächler, is particularly interesting, as it allows for a distinction between three degrees of implication

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[27] *Mémoires pour servir à l'Histoire des hommes illustres dans la République des Lettres* 33 (1736).

[28] His *Description des Plantes de l'Amérique* (1693) described 600 species and his *Nova Plantarum Americanarum genera* (1703) 106 genres. A *Traité des Fougères de l'Amérique* was also published shortly after his death (1705).

[29] In the *Dictionary of Scientific Biography*, Plumier is still considered a naturalist and botanist. But his non-botanical publications were limited to four articles on the cochineal insect and on zoological curiosities he had observed in the West Indies.

[30] David E. Allen, 'The Early Professionals in British Natural History', in Alwyne Wheeler and James H. Price (eds.), *From Linnaeus to Darwin: Commentaries on the History of Biology and Geology* (London 1985), 1–12: 4.

[31] Among the first botanists to be elected as correspondents of the botanical section of the Paris Academie des Sciences were Leonard Plukenet, Pierre Magnol, August Bachmann (Rivinus), William Sherard, Hans Sloane, Giambattista Trionfetti, Raymond Vieussens, Johann Philipp Breynius and Caspar Commelin.

within the networks of the Republic of Letters: one for the *botanici*, one for the *botanophili* and the last for the *venatores*.[32] "Botanici", or true botanists, often practise botany as a part of their professional duties as physicians, professors of botany, curators of botanical gardens and pharmacists, although some of them were lawyers and businessmen. They were treated by Haller as colleagues, who exchanged information with him but also samples of plants or seeds. "Botanophili", or amateurs, were either physicians, surgeons or priests who practised botany during their leisure time or students who willingly sent their findings and specimens to Haller. The master, who treated all of them as disciples, formally recognized their contributions in his own publications; he sometimes favoured them with identifications of specimens, with advice or with doublets. Botanophili were close to the margins of the Republic of Letters, but still within it. By contrast, the "venatores", or simple collectors, had only a basic knowledge of plants. Sometimes students, more often peasants or foresters deprived of any formal training, they collected plants for money and were bound to Haller by a contract. But they rarely corresponded with him.

The Rise of Botany and Botanophily in the Eighteenth Century: A Statistical Assessment

The development of botany in the second half of the eighteenth century was characterized by three tendencies which had an important social dimension: 1) the growing interest in classification, with the dominance of Linné's sexual system, but also the elaboration by the Jussieus of a natural method based on a hierarchy of characters; 2) the rise of botanophilia, i.e. of a dilettantist and sentimental practice of botany exemplified by Rousseau and other self-styled Linneans; 3) the closer connexion between botany and economy, enforced by a growing public and private interest in the exploitation of vegetal resources.[33] All these factors helped

[32] Lienhard 2005 (note 20) and Stefan Hächler, 'Pflanzentransfer in der Korrespondenz Albrecht von Hallers (1708–1777)', in Regina Dauser et al. (eds.), *Wissen im Netz. Botanik und Pflanzentransfer in europäischen Korrespondenznetzen des 18. Jahrhunderts* (Berlin 2008), 201–218. These distinctions, although based on Haller's writings and correspondence, were not formulated by him in this way.

[33] These three tendencies are reflected in Hubert Steinke's typology of the eighteenth-century botanists: Scholars such as Haller (or Linné) coexisted with a category of economists illustrated by Joseph Banks, and with a category of dilettantes exemplified by Rousseau. See Hubert Steinke, 'Gelehrte—Liebhaber—Ökonomen. Typen botanischer Briefwechsel im 18. Jahrhundert', in Dauser et al. 2008 (note 32), 135–147.

to enlarge the audience for botany and to facilitate social perception of the botanist. As a matter of fact, the transfers of useful or ornamental plants practiced by the members of various societies for the improvement of the arts and agriculture mobilized actors well beyond the categories of botanists and botanophiles considered by Linné, mainly priests, gentleman farmers and magistrates.[34] These settings need not be treated in any detail, as the aim here is to evaluate the development of botany and to characterize the actors involved in it.

The difficulty of giving an assessment of the growing popularity of botany is linked to the impossibility of agreeing on a definition of what botanists really were, considering the various aspects of the phenomenon. Given this practical difficulty of categorization, identification must be limited to botanists who have scholarly and specialized backgrounds. Of course, there is a risk of excluding most of the dilettanti (although not Rousseau himself) and a good many of the participants involved in the transfer of plants (except for the more prominent ones such as Joseph Banks).

A corpus defined on the basis of contemporary opinion expressed by affiliation with the major academies (Paris, London, Berlin, St. Petersburg, Stockholm, Bologna) would probably be too limited to fit the criterion of representativeness, since it only includes 296 botanists for the whole period from 1700 to 1830.[35] An enlargement to all authors who published something significant in the field of botany is therefore desirable. The use of Robert M. Gascoigne's *Historical Catalogue of Scientists and Scientific Books* (1984) as a criterion extends the corpus of specialised botanists to 739 persons plus 189 non-specialised botanists and agronomists (Table 1). This collection of 928 botanists probably includes all the important representatives of the discipline who were active between 1700 and 1830. On statistical grounds, it could be interesting to introduce a further distinction between major scholars (category A) and second-rank ones (category B). If one considers as major scholars those listed in the *Dictionary of Scientific Biography* or who were members of at least two of the six major academies of the eighteenth century, the group of major scholars who practised botany as a first science would number 165

[34] See, in the case of the *Oekonomische Gesellschaft* of Bern, the analysis of plant transfers made by Martin Stuber, 'Kulturpflanzentransfer im Netz der Oekonomischen Gesellschaft Bern', in Dauser et al. 2008 (note 32), 229–269.

[35] This corpus includes all the affiliated botanists living after 1700 and born before 1806.

Table 1. Attempt at a formal categorization and statistical census of the persons involved in botany between 1700 and 1830. Exact numbers given for the first four categories refer to identified scholars obeying to formal criteria of selection. This diagram shows that only specialized botanists of major importance (A1) as well as second-rank ones (B1) can be identified with some hope of establishing a representative sample. This sample would be limited to 739 specialists (165 A1 + 574 B1), with a possible enlargement to further 189 non-specialized botanists and agronomists which have been clearly identified (71 A2 + 118 B2).

	Major Botanists (A)	Second-rank Botanists (B)	Minor Botanists and Amateurs (C)
Specialized Botanists (1)	**165** (Linné, Banks)	**574** (v. Royen, Tilli)	c. 1100 "botanophiles" (Gaudy, Micheli)
Non-specialized Botanists (2)	c. 300 **71** identified (Haller, Heister)	c. 1000 **118** identified (Falck, Scopoli)	? "herbalists"
Occasional Botanists (3)	c. 400 ? a few identified (Buffon)	c. 1400 ? a few identified (Rousseau)	? "dilettanti"

persons (A1). The remaining group of specialised scholars, who can be considered second-rank botanists (B1), would then number 574, all listed in Robert Gascoigne's *Catalogue* (1984), or be members of one of the six major academies of the eighteenth century. Unless stated otherwise, further investigations are based on categories A1 and B1.

Within these two formally defined categories of specialists, the number of potentially active scholars (over age 20) increased regularly in the first half of the eighteenth century: they were 60 per cent more numerous in 1750 than in 1700 (fig. 1). This community expanded at an accelerated rate in the second half of the century (+ 112 per cent over 50 years), and kept growing at the same pace in the first quarter of the nineteenth century. Rather than absolute numbers (which were 78 in 1700, 126 in 1750, 268 in 1800 and 368 in 1825), it is the rhythm which is significant. The acceleration that took place around 1740 caused the number of botanists to rise by + 250 per cent until 1825, that is within a period of three generations (85 years). Yet, among the first-rank botanists (A1), the increase was slower and more regular throughout the eighteenth century: it even came close to a standstill after 1800.

Of course, the community of potentially active botanists was much larger than the 739 identified specialists in our categories A1 and B1. Among the

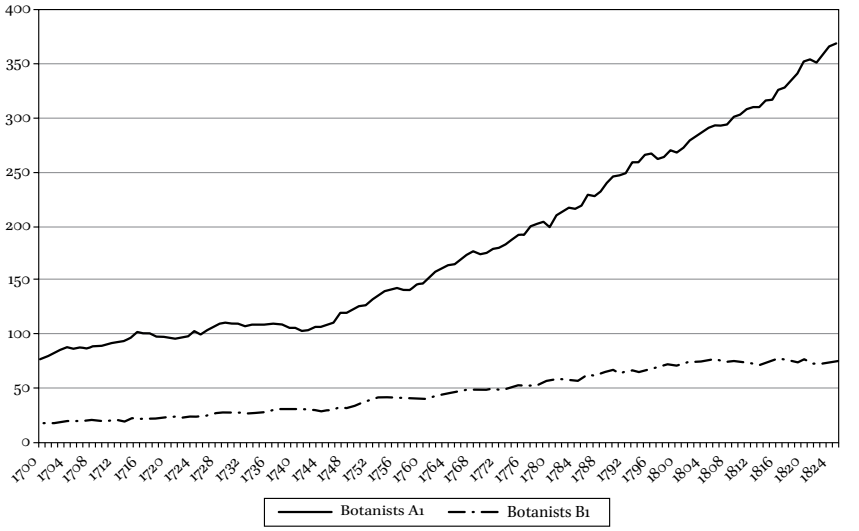

Fig. 1. Evolution of the number of specialized botanists between 1700 and 1825.

many scholars who practised botany as a secondary discipline (A2 or B2), some, such as Boerhaave, Haller or Erasmus Darwin, played an important role in its development. But the proportion of identified scholars who fall within our sample (189 among many hundreds) is probably too small to be significant. The vast majority of them left little trace of their botanical activities in the current biographical records.[36] Further categories of more or less "invisible" botanists would include major or less important scholars who have practised botany as an occasional or casual activity (A3 or B3). Among them, one probably has to consider the curious cases of Buffon, the famous intendant du Jardin du roi, who indeed published nothing significant in the field of botany, and of Jean-Jacques Rousseau, who collected plants as a dilettante. If the proportions between specialised botanists (1), non-specialized botanists (2) and casual ones (3) are impossible to establish, an estimation can be attempted on the assumption that 10 per cent of Haller's correspondents practised botany as their main field of study, while 18 per cent made it an important theme in their correspondence and about 25 per cent an occasional theme.[37]

[36] The most comprehensive databank used in this study is the *World Biographical Information System* [WBIS] edited on index cards by SAUR AG in Munich. For the major European nations, these data are also available online in some libraries.

[37] Lienhard 2005 (note 20), 373.

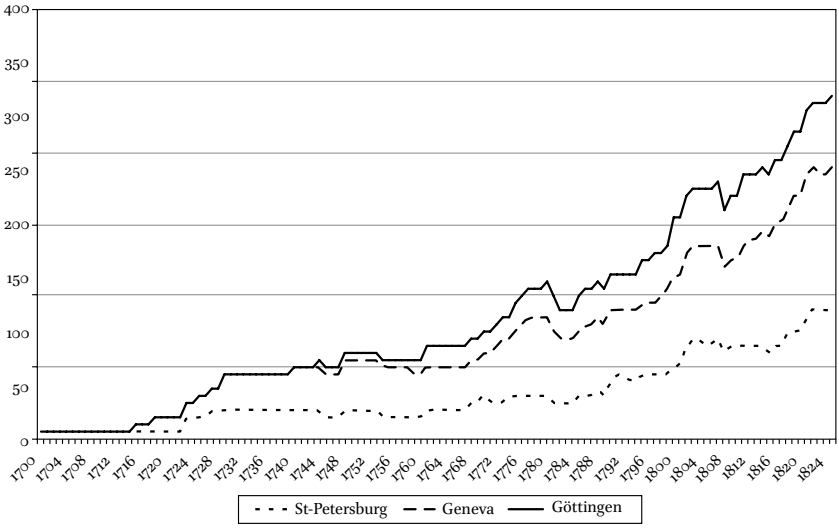

Fig. 2. Evolution of the number of "Botanophiles" in three European cities between 1700 and 1825.

The case of the botanophiles is different, at least if we consider them as minor botanists or as shadow cooperators with more important botanists. Even if they usually left few recorded traces, many of them displayed some serious activity in the study of plants by collecting and sending specimens, publishing or teaching, management of a botanical garden, patronage, etc. A small portion of them who identified new species are registered by Frans Stafleu or R.K. Brummitt,[38] but their total number can only be guessed. On the basis of closer investigations made in Geneva, Göttingen and St. Petersburg, the identifiable part of this large group (category C1) seems to be about 1.5 times the total number of botanists in A1 and B1 taken together. This would mean about 1,100 persons for the whole period from 1700 to 1830. On the basis of the data available for these three cities, it appears that the number of botanophiles rose at an accelerated rate after 1770 and especially after 1795 (fig. 2). Compared to the number of known and well-known botanists, it seems that the number of botanophili

[38] Frans A. Stafleu and Richard S. Cowan, *Taxonomic Literature. A Selective Guide to Botanical Publications and Collections with Dates, Commentaries and Types* (second edn., Utrecht 1976–1988), 7 vols.; R.K. Brummitt, C.E. Powell et al., *Authors of Plant Names: A List of Authors of Scientific Names of Plants* (Kew 1992).

flowered at a superior rate after 1770 and especially in the first quarter of the nineteenth century.

The number of herbalists (C2), either apothecaries, venatores or unlettered healers practising folk medicine, will remain unknown forever. So will the number of dilettanti from the upper and middle classes of society (C3), whose intermittent passion for vegetables was part of a social fashion for gardening, for natural specimens and even for beautiful arts.[39]

The spectacular development of botanophilia in the age of Enlightenment was a reflection of a new taste for nature, for instruction, for natural artefacts and for scientific books. The creation of academies and learned societies, the multiplication of newspapers and libraries and the development of scientific knowledge in general were all part of this favourable context. More specific was the role of Linné's *Genera plantarum* in the popularization of botany. According to Roger L. Williams: "The practicability and the relative simplicity of the sexual system, along with the new binominal nomenclature, stimulated an upsurge in botanical research by professionals by mid-century, and sustained the botanophilia of amateurs even into the early decades of the 19th century".[40]

Condorcet had already emphasized, in his historical eulogy of Linné, that his work introduced a revolution in botany and that his principles and nomenclature had made this science accessible as never before.[41] Pascal Duris has analysed the influence of Linné, mediated by Rousseau, on the development of a sentimental, moral and patriotic apprehension of nature that favoured the practice of herborization.[42] More difficult to grasp are the connections between the blossoming of botany and the development of a scientific agriculture (agronomy), the influence of the physiocratic school in France, and the science of State and estates management in Germany (cameralism), and the impact of the colonial expansion of trading companies (notably the various East Indian and West Indian companies).[43]

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[39] See Yves Laissus, 'Les cabinets d'histoire naturelle', in René Taton (ed.), *Enseignement et diffusion des sciences en France au XVIII^e siècle* (Paris 1964), 659–712. For a general history of collecting, see Krzysztof Pomian, *Des saintes reliques à l'art moderne, Venise-Chicago, XIII^e–XX^e siècles* (Paris 2003).

[40] Williams 2001 (note 1), 24.

[41] [Condorcet], 'Eloge de M. de Linné', *Histoire de l'Académie royale des Sciences. Année 1778*, 66–84: 72–73.

[42] Pascal Duris, *Linné et la France (1780–1850)* (Genève 1993).

[43] See Londa Schiebinger and Claudia Swan (eds.), *Colonial Botany, Science, Commerce and Politics in the Early Modern World* (Philadelphia 2005); also David Philip Miller and

Conflicting Views about the "Botanical Republic"

In the eighteenth century, the nature and true limits of botanical science were subject to much debate. Tournefort had considered agriculture and gardening as integral parts of botany, but in the eyes of Linné, so-called "physicists farmers" or "farmers botanists" such as Duhamel du Monceau or the abbé Jean-François Rozier, were no true botanists. Especially in France, the question whether plant "physics" (plant physiology) and agriculture belonged to botany or not remained controversial until the early nineteenth century.[44] In a volume of Diderot's *Encyclopédie* published the very same year as Linné's *Philosophia botanica* (1751), Daubenton, himself a naturalist, regretted that most botanists had focused their interests on nomenclature at the expense of the cultivation of useful plants, which would have increased the sources of public wealth. This "philosophical" ideal was shared by the physiocrats and agronomists alike.[45] Other botanists subscribed to Linné's predominantly taxonomic conception of their discipline. In his *Démonstrations élémentaires de botanique* (vol. I, 1766), Claret de La Tourrette considered that the botanist's duty was to found the means to identify the various species of plants whereas the "physicist naturalist" had to examine the internal structure and the function of the plant's organs. In the *Encyclopédie méthodique* (1785), Lamarck explained that agriculture, gardening and rural economy, although useful to botany, were by no means a part of it. The Linnean botanist Jean Emmanuel Gilibert was also convinced that the study of botany had to exist without any links to its neighbouring and subsidiary sciences, so that one can be an insightful botanist without being a physician, a pharmacist or an agriculturist (1798).[46]

Yet other specialists were ready, especially after 1800, to remove the disciplinary barriers established by the Linneans and to take into consideration the emergence of vegetable physiology and scientific agriculture.

Peter Hanns Reill (eds.), *Visions of Empire. Voyages, Botany and Representations of Nature* (Cambridge 1996).

[44] On this question, see Patrick Bungener, 'La botanique au service de l'agriculture. L'exemple des savants genevois', in Paul Robin., Jean-Paul Aeschlimann and Christian Feller (eds.), *Histoire et agronomie: entre ruptures et durée* (Paris 2007), 285–302. Most of the following references on the topic are taken from this article.

[45] See, among others, Duhamel du Monceau's *Physique des arbres* (1758) and Rozier's *Cours complet d'agriculture* (1782).

[46] Jean Emmanuel Gilibert, *Histoire des plantes d'Europe ou Eléments de botanique pratique* (Lyon 1798), 2 vols.

In 1798, Louis Claude Richard stated that the multiplicity of tasks which the botanists had to face made it very difficult to draw a line between what belongs to botany and what does not.[47] His colleague J.C. Philibert added that the recent developments in botany had greatly enlarged the significance of the word, so that one could not know if a general treatise on botany also dealt with the physical details of plants, their use and cultivation, or only with methodical classification.[48] For Dominique Villars, the association of agriculture and related disciplines with botany made its practice wider and more interesting, although perhaps a bit less deep than a science.[49] As a general tendency, the rise of the natural methods of classification favoured the idea of closer cooperation between vegetable anatomy, physiology and botany. From 1794 to 1828, the idea of a necessary unity between these different plant sciences would thus be defended in turn by Ventenat, Jaume Saint-Hilaire, Du Petit Thouars and Candolle.[50]

The Structure of Botanical Networks

That the "utilitarian" investigators of plants were accepted as ordinary members of the Botanical Republic, at least by the end of the eighteenth century, seems plainly confirmed by the central position occupied by Joseph Banks (1743–1820) in the botanical and scholarly networks of the time. Conversely, it can be shown that the major factors of marginalization within the Botanical Republic were not a matter of non-conformity to the Linnean conception of botany. In fact, Linné was himself interested by the economic and medical uses of plants in a way that his philosophical positions did not indicate.[51]

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[47] *Dictionnaire élémentaire de botanique par Bulliard, revu et presqu'entièrement refondu par Claude Marie Richard* (Paris 1798).

[48] J.C. Philibert, *Introduction à l'étude de la botanique* (Paris 1799), 3 vols.

[49] Dominique Villars, *Mémoire sur les moyens d'accélérer les progrès de la botanique* (Paris 1801).

[50] Etienne Pierre Ventenat, *Principes de botanique expliqués au Lycée républicain* (Paris 1794); Jean Henri Jaume Saint-Hilaire, *Exposition des familles naturelles et de la germination des plantes* (Paris 1805), 2 vols.; A. Aubert Du Petit Thouars, *Essais sur la végétation considérée dans le développement des bourgeons* (Paris 1809); Augustin Pyramus de Candolle, 'Phytologie ou botanique', in Bory de Saint-Vincent (ed.), *Dictionnaire classique d'histoire naturelle* (Paris 1828), vol. XIII, 478–491.

[51] See Lisbet Körner, *Linnaeus, Natur und Nation* (Cambridge 1999); and Gerlinde Hövel, *"Qualitates vegetabilium", "vires medicamentorum" und "oeconomicus usus plantarum" bei Carl von Linné. Erste Versuche einer zielgerichteten Forschung nach Arznei- und Nutzpflanzen auf wissenschaftlicher Grundlage* (Stuttgart 1999).

If Linné's central position within the Botanical Republic of his time had needed confirmation, a comparison of his ego-network of correspondence with those of the few other botanists for which such data are available would rapidly produce such a confirmation. Even if Joseph Banks and Albrecht von Haller had apparently exchanged more letters and with more correspondents than Linné, their *significant* links with other scholars, and notably with other botanists, were not greater in number than his.[52] And when compared to other important botanists such as Christoph Jacob Trew, Pier Antonio Micheli, Giovanni Targioni-Tozzetti and his son Ottaviano, the great centrality of the Uppsala professor of medicine and botany appears even more obvious.[53]

Among Linné's correspondents, 232 would figure in our categories A or B of major or second-rank men of science. 60 of them entertained significant links with him, i.e. they wrote him a minimum of ten letters.[54] Among them, 31 were specialised botanists either of major importance (15) or of second rank (16); most of the 29 other men of science were naturalists. At least five botanists wrote him more than 50 letters (or received 50 letters from him): Nikolaus Joseph von Jacquin, Antoine Gouan, François Boissier de Sauvages, Johan Frederik Gronovius and Johannes Burman.

Albrecht von Haller's larger and more diversified correspondence encompassed 280 men of science, 82 of them linked to him by significant exchanges.[55] Besides many physicians, anatomists and physiologists, this group of epistolary cooperators included 32 specialized botanists either of major scientific importance (15) or of second rank (17), i.e. quite the same number as for Linné. But the botanists linked with Haller by more than 50 letters on either side were ten in number: Johannes Gessner, Johann Gottfried Zinn, Johann Georg Gmelin, Antoine Gouan, Nikolaus Joseph von Jacquin, Christian Gottlieb Ludwig, Johann Friedrich Schreiber, Achilles Mieg, Wernhard de Lachenal and Georg Christian von Oeder. This structural difference in the intensity of the closest exchanges may be related to the fact that Haller had a different conception of botany than Linné, which

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[52] An exchange of correspondence including a minimum of ten preserved letters on one side (more frequently the passive one) is considered significant. Other thresholds can be established at 20, 50 or 100 preserved letters on one side.

[53] More details about this method of comparison are given in René Sigrist, 'Correspondances scientifiques du 18e siècle: présentation d'une méthode de comparaison', *Revue Suisse d'Histoire* 58 (2008), 147–177.

[54] Source: Nyström and the Swedish Linnaeus Society (note 15). Men of science are defined according to the same criteria as before (categories A and B).

[55] The annotated inventory of Haller's letters has been published by Urs Boschung et al. (eds.), *Repertorium zu Albrecht von Hallers Korrespondenz, 1724–1777* (Basel 2002), 2 vols., II.

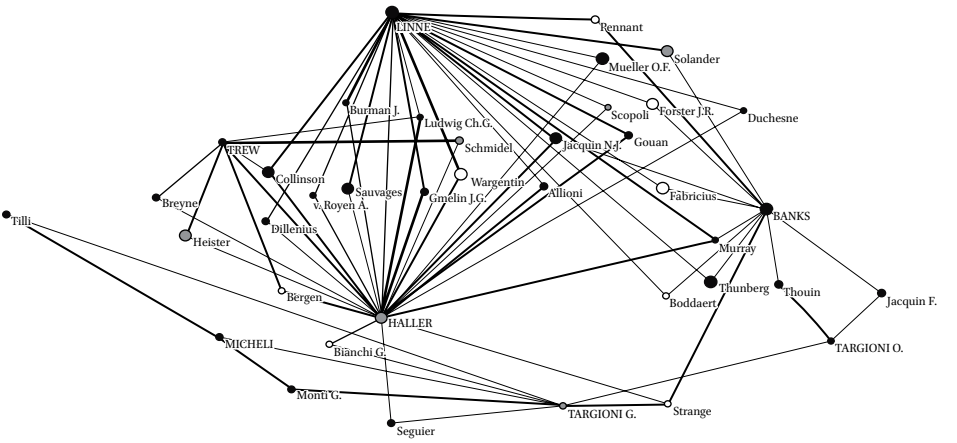

Fig. 3. Significant epistolary links, direct or indirect, between seven of the major botanists of the 18th century: Trew, Linné, Haller, Banks, Micheli and Targioni-Tozzetti father and son. Ranked by chronological order, specialized botanists are represented by black spots, non-specialized ones by grey spots, other men of science are figured by white spots.

produced a much more restricted area of investigation and also a different form of cooperation.[56] Before rivalries prevailed, they nevertheless exchanged 30 letters (on each side) directly. During their whole careers, they also shared no less than 15 significant scientific correspondents in common (fig. 3). Among them, 13 were specialized botanists (Dillenius, Collinson, J. Burman, A. van Royen, Boissier de Sauvages, Ch.G. Ludwig, J.G. Gmelin, Allioni, N.J. Jacquin, A. Gouan, O.F. Müller, J.A. Murray and N. Duchesne) and another was a non-specialised botanist (Scopoli). The existence of a "Botanical Republic" based on significant exchanges of correspondence between specialists was therefore a reality, even if Linné and Haller may have been competing to enrol their correspondents under different banners.

A further comparison with the epistolary network of Joseph Banks shows that the central positions within the Botanical Republic were not restricted to academic scholars, at least by the end of the eighteenth century. The lifelong President of the Royal Society of London indeed entertained one of the most extensive epistolary networks of his time, even if we consider his scientific partners only, who were no less than 400.[57] Among

[56] On Haller's conception of botany, see Luc Lienhard 2005 (note 20).

[57] 396 are registered in Warren R. Dawson (ed.), *The Banks Letters* (London 1958), but the inventory is not complete.

them, 65 entertained significant links with this gentleman botanist, 26 being themselves botanists, either of major importance (17) or of second rank (9). This group of specialized cooperators is nearly as important as those connected with Linné and Haller. Only the density of the epistolary links may be somewhat lower, at least compared to Haller, since Banks exchanged more than 50 letters on either side with three botanists only: James Edward Smith, Thomas Andrew Knight and L'Héritier de Brutelle. The attention of Banks, an important figure in State politics and economy, was perhaps solicited by too many correspondents to allow for intensive exchanges with a large number of them.

If service to the imperial interests of the British Crown was not incompatible with a nodal position within the Republic of Letters, marginalising factors must be sought elsewhere.[58] The example of the German physician Christoph Jacob Trew (1695–1769) indicates that geography may be one of these factors.[59] Living in provincial cities like Nuremberg and Anspach was probably not the best position to be in for developing intense exchanges with foreign men of science; 90 per cent of Trew's 27 significant scientific correspondents lived in Germany.[60] Social position was probably another factor limiting scientific reputation and contacts, as shown by the example of the Italian gardener Pier Antonio Micheli (1679–1737). In charge of the small "Orto agrario" in Florence between 1717 and 1737, Micheli remained, professionally speaking, a gardener even though he achieved unquestionable fame as a botanist. Despite his regular exchanges with William Sherard, Hermann Boerhaave and Johann Jakob Scheuchzer, 60 per cent of his significant contacts remained confined to Italy, including all those who wrote more than 50 letters to him: the botanists Giovanni Girolamo Zanichelli, Giuseppe Monti and Michelangelo Tilli, and the zoologist Giuseppe Zinanni.[61] The position of Micheli's successor Giovanni Targioni-Tozzetti (1712–1783) within the Republic of Letters was still closer to its margins: his ego network was limited to 12 significant correspondents, only two of

[58] An initial identification of these factors (mode of cooperation, field of study, nationality, personality) has been attempted in René Sigrist 2008 (note 53).

[59] On the correspondence between Trew and Haller, see Hubert Steinke (ed.), *Der nützliche Brief: Die Korrespondenz zwischen Albrecht von Haller und Christoph Jakob Trew, 1733–1763* (Basel 1999). I thank the author for putting the inventory of Trew's correspondence at my disposal.

[60] His main botanical respondents were Casimir Christoph Schmidel, Lorenz Heister, Christian Gottlieb Ludwig, Johann Philipp Breyne and the Englishman Peter Collinson.

[61] Most of Micheli's passive correspondence is kept in the Targioni-Tozzetti papers in the Florence public library (Biblioteca Nazionale Centrale). I thank Daniela Parrini for having completed this inventory.

them living outside Italy.[62] For Targioni, the social factor cannot be the explanation, since he started his career as a physician and became keeper of the Magliabecchi library and curator of the small botanical garden (between 1737 and 1745) before going back to the practice of medicine. But the languishing intellectual context of Florence after the extinction of the Medici family (1737) was probably not ideally suited to the practice of science and to the development of international contacts. Probably still more difficult was the political and cultural context faced by Targioni's son Ottaviano (1755–1826). Through the mediation of André Thouin and Franz von Jacquin, the professor of botany at the Regio Liceo of Florence (1801–1825) developed some intense although indirect contacts with foreign botanists, especially Joseph Banks in England and A.L. de Jussieu in France.[63] But again, 16 of his 20 significant correspondents were Italian, including all those who wrote more than 50 letters to him: the botanists Gaetano Savi (225 letters!), Antonio Bertoloni, Domenico Nocca and Filippo Re. Therefore, if the Botanical Republic was a universal network, it was mainly so thanks to the addition of individual networks and through a considerable number of third party mediations.

Origins, Training and Professional Careers of Botanists

The examples quoted above show that beyond some central figures in the Republic of Letters, the reality of ordinary botanical research was largely a national affair, and even a local one. It is therefore to be expected that the professional categories of the actors involved in the study of plants also vary from one country to another. Another factor which has apparently escaped the attention of historian sociologists is that the social characteristics of individuals change in the course of life. Professional identities therefore also have to be considered as something which changes in the course of life, like a "cursus honorum". Gaps between acquired positions and social status inherited from the family are also interesting to consider.

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[62] On the correspondence of Giovanni Targioni-Tozzetti, see Tiziano Arrigoni, 'Inventario del carteggio di Giovanni Targioni Tozzetti', *Nuncius* 1 (1986), 59–139.

[63] On the correspondence of Ottaviano Targioni-Tozzetti, see Daniele Vergari, 'La corrispondenza di Ottaviano Targioni Tozzetti', *Nuncius* 17 (2002), 91–163.

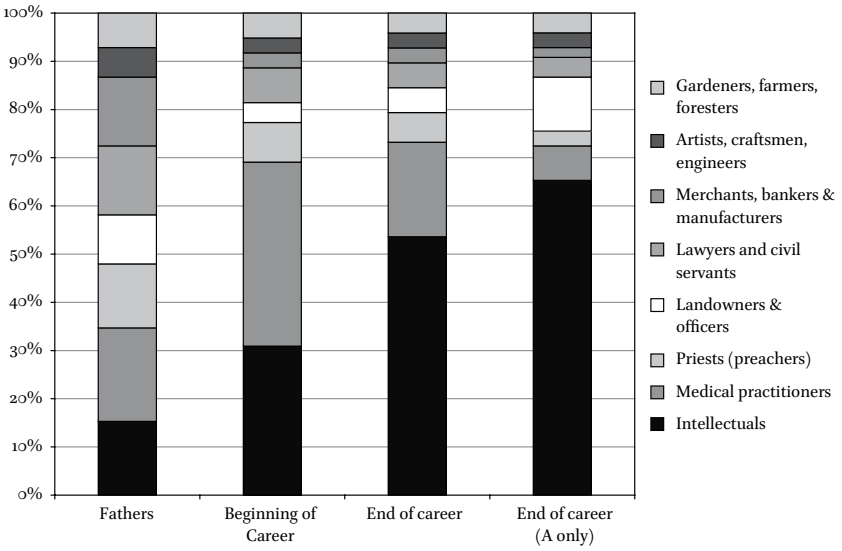

Fig. 4. Professions of the specialized botanists and of their fathers (1700–1830).

On the basis of available biographies,[64] the social status of fathers has been determined for 418 specialized botanists in our sample, 129 being of major importance (A1) and 289 of second-rank (B1). It is noticeable that no significant difference exists between the social origins of these two groups of botanists. Among the fathers, the medical professions come first with 19 per cent, before lawyers and civil servants (15 per cent) and a group of "intellectuals", including professors, full time researchers and other men of letters (15 per cent) (fig. 4, col. 1). The pastors represent 13 per cent, the merchants, manufacturers and bankers 12 per cent (14 per cent if one includes a few employees). Members of the gentry (as well as army or navy officers) constitute 11 per cent, the gardeners and nurserymen 3 per cent (7 per cent with the farmers and foresters), the craftsmen and engineers 5 per cent, the artists 2 per cent. Intellectual heritage in direct line is not frequent, since only 7 per cent of the fathers of specialized botanists (A1 and B1) were, socially speaking, professional botanists or gardeners. The proportion rises to 10 per cent for the first rank botanists (A1). A further 4 per cent had fathers who made a name in sciences other than botany.

64 In the WBIS (note 36). Of course, indications contained in Charles C. Gillispie (ed.), *Dictionary of Scientific Biography* (New York 1970–1980), 16 vols. and in the *Oxford Dictionary of National Biography* (Oxford 2004), 60 vols. have been added to those of the WBIS.

The education of botanists, either formal or not, is often poorly documented in the biographies, so as to prevent any serious statistical analysis. Yet a good impression of it can be gained from the first professions in which they engaged just after finishing their training. In nearly half of the cases, these studies or apprenticeships were connected with medicine or pharmacy. The logical consequence is that 37 per cent of the future botanists started a professional practice as physicians, pharmacists or surgeons (fig. 4, col. 2). And among the 16 per cent who started a career with teaching positions, more than half had also studied medicine and about one third had a philosophical degree. Among the 14 per cent of other intellectuals (academicians, men of letters), many had a philosophical degree. Theologians and lawyers constituted slightly less than 10 per cent each.

At the height of their careers, 52 per cent of the specialized botanists in our sample study can be considered to be engaged in intellectual professions (professors, academicians, men of letters) (fig. 4, col. 3). The proportion rises to 64 per cent for the greater botanists (A1). Other botanists belonged to the medical professions (19 per cent, but only 7 per cent for category A1), the Church (6 per cent, but only 3 per cent for category A1), to the gentry or the army (6 per cent and even 12 per cent for category A1), and to the legal and administrative professions (5 per cent). The remainder were active either in gardening, forestry, husbandry and farming (4 per cent), in trade or banking (3 per cent), in the fine arts (2 per cent) or in crafts and engineering (1 per cent). The obvious conclusion is that the passion for botany was often developed at the expense of the pursuit of an active medical practice: the proportion engaged in the medical professions drops from 37 per cent just after training to 19 per cent later in life (and to 7 per cent for the major botanists). In a similar trend, the proportion of ecclesiastics (priests) declines from 8 per cent to 6 per cent. That of the lawyers, civil servants and employees goes from 8 per cent to 5 per cent. On the other hand, the group of gentlemen farmers and officers registers a significant increase from 4 per cent to 6 per cent, a proportion which doubles (to 12 per cent) for the major botanists. It would even be higher if agronomists were included in the sample.

The Question of Scientific Professionism

David E. Allen has argued that even in the early nineteenth century, scientific professionalisation remained a complex matter which cannot be analysed as we would do it today, by the mere counting of fixed and

salaried positions attributed to scholars.[65] In the eighteenth century, university professors, ordinary academicians and travelling naturalists were poorly paid, the salaries of gardeners, nurserymen and curators of public or private collections were little more than symbolic, and the curators of botanic gardens often received no money. Except for a few royal gardens (Jardin du Roi in Paris, Kew gardens in London), the position of director was little more than an additional charge conferred on persons who already assumed teaching duties in the institution which managed the garden. Symbolic positions were nevertheless important to secure a scientific identity and legitimacy for those who already benefited from rents or estates or did not want to remain confined to the traditional careers in law, trade, warfare or manufacture. Scientific distinctions and sinecures were therefore eagerly sought after, usually with the help of courtly or scholarly patrons.

We have seen that medical and pharmaceutical training was the favourite entry to the world of botany, but also that the development of a scientific career often took place at the price of a shift to a university professorship or to positions as demonstrator, curator or librarian, which were often reached after years of an adventurous life as a travelling naturalist. As an alternative, training in philosophy was an opportunity for a group of private tutors and secretaries, editors and writers to develop botany as their vocation. Studying theology and even law could also lead to botany, as long as professional duties allowed for plenty of leisure time. Yet young ecclesiastics, lawyers, tradesmen, bankers and even lecturers in the sciences or humanities were more likely to remain rank-and-file botanists than physicians and tutors. Gentlemen living a noble life had good opportunities to achieve some renown as botanists, especially if they inherited their estates or rents early in life. Gardeners, nurserymen, foresters and artists constituted a small group of technicians that remained close to the margins of the Botanical Republic. Specialized agronomists were a mixture of gentlemen and technicians.

In any case, achieving a high level of scientific expertise was easier for those who pursued intellectual careers, either as full-time researchers in botany (academicians, keepers of herbaria) or as teachers (botany professors or lecturers), and for those who experienced the precarious status of travelling botanists or remained in the less prestigious positions of nurserymen or gardeners. But all these "professionals" (by eighteenth-century

[65] Allen 1985 (note 30), 3.

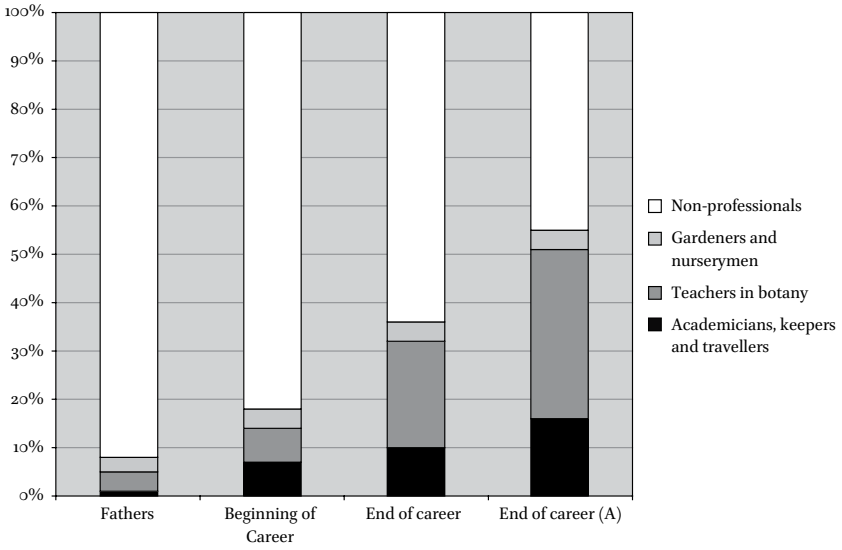

Fig. 5. Social status of "professional" botanists and of their fathers (1700–1830).

standards) represented no more than 18 per cent of the specialized botanists at an early stage in their careers and 36 per cent later in life (fig. 5). Among the first-rank botanists (A1), they accounted for 55 per cent at the end of the "cursus honorum". The proportion of professors and lecturers rises from 16 per cent at an early career stage to 34 per cent later in life, and even to 42 per cent for first-rank botanists.

Yet institutional positions available for botanists are not easy to list in a systematic way. Chairs of botany were often associated with other medical or scientific teachings, whereas garden directors usually remained unpaid. Academic pensions and curator positions frequently implied other duties than pure research, and royal missions or commands were limited in time. Finally, a few positions were conferred on individuals who were not part of the category of specialized botanists. This being said, 24 professional positions were identified in 1700, when the number of specialized botanists was 78, amounting to 31 per cent of the "institutionalized" botanists. Fifty years later, the number of identifiable positions had reached 30 among 126 botanists (24 per cent):[66] the number of botanists had therefore risen

[66] In fact, five positions were occupied by non-specialised botanists in 1750 (rising to seven in 1800 and 12 in 1825). But the important thing here is to keep the same criterion to allow for comparisons.

a little faster than the quantity of available positions. In the second half of the eighteenth century, university and political authorities doubled the number of existing positions to 65, but the number of botanists also doubled, to 268, so that the percentage of institutionalization remained the same (24 per cent). Finally, the creation of new positions in the first quarter of the nineteenth century (102) occurred slightly more rapidly than the increase of specialized botanists (368), so that the percentage of institutionalization rose again to 28 per cent. In the long run, the available positions and the number of botanists increased in similar proportions, with probable differences from one country to another.

Conclusion: A Great Diversity of Actors

By the middle of the eighteenth century, a natural method of classification of species had been established by Linné, Bernard de Jussieu and others as the dominant paradigm for botany.[67] The creation of new institutional positions, mainly in university settings, allowed for a certain amount of professionalisation and specialization which were required for the establishment of a new discipline. The accession of many physicians, apothecaries or even surgeons to research or teaching positions in botany was a trend that illustrates ongoing emancipation from medical science. Yet other tendencies underline the differences between the Enlightenment botanists and the true professionals of the nineteenth and twentieth centuries.

First of all, botanists interested in the medicinal virtues of plants did not disappear from the scene, even by 1800. The tradition of herbalism, associated with medical practice since the times of Hippocrates, Dioscorides and Galen, was still alive among apothecaries. Catalogues of plants useful in pharmacy and medicine, reissued throughout the eighteenth century, earned a reputation for their compilers, such as Pierre Jean Baptiste Chomel, Pierre-Joseph Buchoz, François Marquet, Jaume Saint-Hilaire and Joseph Roques.[68] In many universities, botany remained closely associated with "materia medica", pharmacy, and even chemistry. By the end of the eighteenth century, many botanical gardens were still conceived as

[67] Bernard de Jussieu introduced his natural method of plant classification first in the Jardin de Trianon and after 1774 in the Jardin du Roi.

[68] See Williams 2001 (note 1), 80–82. As a telling example, Chomel's *Abrégé de l'histoire des plantes usuelles* was constantly reissued between 1712 and 1803.

herb gardens for growing "simples" and improving existing pharmacopoeias. Even founders of the natural method such as A.L. de Jussieu or Candolle had not abandoned the idea of determining the medicinal virtues of plants from their external characters.[69] In a similar way, Nicolas-Théodore de Saussure tried to link the chemical composition and nutritive quality of plants to the nature of the terrain on which they grow.[70] Both Candolle and Saussure nonetheless concluded that much remained to be done before any decisive conclusions could be reached.

A second characteristic feature of eighteenth-century botany and agronomy, which remained unchanged in the first third of the nineteenth century, was the place occupied by the nobility of landowners and retired military officers. This social elite, comprising about 12 per cent of the major botanists, benefited from a relatively central position within the Botanical Republic. John Ray, Johann Centurius von Hoffmannsegg, Jean-André Peyssonnel, and also Duhamel du Monceau and John Evelyn were among the most famous of this elite. If one considers the agronomists as a separate group, brief statistics, based on the 64 included in our sample (as A2 or B2), show that at least one third (34 per cent) were landowners. One fifth (20 per cent), who frequently enjoyed comfortable incomes, were also lawyers, civil servants, governors and state administrators. Like Malesherbes, Turgot and Pierre Poivre, the members of this privileged group were often close to governmental circles, especially in France, where the physiocratic school had a certain influence. Another group of agronomists consisted of directors of specialised schools of agronomy, forestry or husbandry (14 per cent). Then came a few university professors (9 per cent) and various men of letters (6 per cent).

If agronomists differ from botanists in social characteristics, they also have different, more practical, aims. Their great interest in cultivation, nursery, forestry and vegetable physics pushed them to undertake various experiments in cross-fertilization of domestic vegetables and animals. Beyond the practical knowledge sought, such experiments stirred theoretical interrogations about hybridization and the reproduction of species. Even Duhamel du Monceau's experiments in vegetable physics, carried

[69] In his doctoral thesis, Candolle attempted to provide a scientific basis for the study of "materia medica" and to define the natural laws governing the distribution of medical virtues according to natural plant families. See Augustin-Pyramus de Candolle, *Essai sur les propriétés médicales des plantes, comparées avec leurs formes extérieures et leur classification naturelle* (Paris 1804).

[70] Nicolas-Théodore de Saussure, *Recherches chimiques sur la végétation* (Paris 1804).

out on his own estates, would have been more difficult to perform in an academic setting, or in a garden devoted to the cultivation of "simples".

Priests of all religions also figured among the most characteristic groups involved in eighteenth-century botany. The tradition of herbalism had been practiced by some religious orders since the Middle Ages. Some congregations, such as the Vallombrosians of Florence, were still very active in eighteenth-century botany.[71] But Protestantism was no less important if we consider that 13 per cent of all European botanists in the period 1700–1830 were sons of pastors.[72] For the period 1700 to 1830, priests of all denominations represented an average of 8 per cent of the young botanists, a proportion which would be higher if teachers in denominational colleges were included. Later in life, a certain number of them turned to teaching positions or left the Church in the wake of the French Revolution. As a general tendency, the proportion of priests, more important in the first half of the eighteenth century, rapidly declined towards the end of the century and in the beginning of the nineteenth century. Their number nevertheless remained significant among second-rank botanists and especially among amateurs in both Protestant and Catholic countries. Far from the nodes of the Botanical Republic, rural priests were often good experts on local flora. Like German "Landphysici" and teachers in elementary and grammar schools, they often collected specimens for famous botanists. Some of them also practised botany as a facet of pasigraphy, i.e. the study of the civil history, archaeology, geography and natural history of a parish, a valley or a rural district.

Amateurism was also the dominant model among lawyers and civil servants, merchants, bankers and manufacturers, craftsmen and engineers, and also professional writers. Some of them, close to the social elite of the agronomists, were inspired by French philosophy and by its emphasis on diffusion and utility. Besides the improvement of useful cultures, hundreds of amateurs across Europe described new plants growing in private gardens and nurseries, where exotic plants collected overseas were acclimatised either for commercial purposes, for the sake of knowledge, or for aesthetic pleasure. Others, more inspired by the publication of Rousseau's

[71] Pier Antonio Micheli's masters Don Bruno Tozzi (1656–1743) and Don Virginio Falugi (c. 1665–1707) belonged to this religious order, like many amateurs of botany in eighteenth-century Florence, for instance Fulgenzio Vitman, Blasio Biagi, Vitale Magazzini, Giovanni Francesco Maratta and Gaetano Moniglia.

[72] In the Protestant countries, nearly one fourth of all botanists were the sons of pastors.

Lettres élémentaires sur la botanique à Mme De L. (1781), practiced botany as a contemplation of the beautiful and the true, as a kind of sentimental education. They often had little scientific ambition and entertained few contacts with the Botanical Republic.[73] Contrary to academic botanists, they remained connected to the Linnean system. Their faith in Nature as the source of the good contributed to the flourishing of provincial "Linnean societies", especially in France.[74] For some of them, the description of local flora was also a response to patriotic motives.[75]

Also relegated to the margins of the Botanical Republic were the gardeners, whose technical knowledge Linné judged to be a poor contribution to the science of plants. Chief gardeners and nurserymen were of course indispensable in the management of botanical gardens, and the more enlightened ones made a true contribution to the development of botany. Pier Antonio Micheli in Italy, André Thouin, Jacques-Philippe Cels and Jean-Louis Thuillier in France, Peter Collinson, William Townsed Aiton and William Aiton in Great Britain and Friedrich Pursh in Germany were among the finest examples.

Typical of the aesthetic component of eighteenth-century botany is the small group of flower painters who mark a transition between science and the arts, either useful or ornamental. If the layout of a garden was the privilege of a small elite, the great illustrated flower books became a very fashionable item, which saw a kind of golden age from the 1760s onwards. A few illustrators with a more scientific turn of mind helped to improve the representation of plants, and especially their most characteristic parts.[76] In this branch of arts and crafts, the standard was set by Georg Dyonisius Ehret's collaboration on Linné's *Hortus Cliffortianus* (1738). In France, the Revolution converted many fashionable painters of plants and animals of the Old Regime into professional associates of the natural scientists. In 1794, one of the twelve chairs of the new Museum of Natural History in Paris was devoted to iconography and conferred on Gérard van

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[73] Rousseau himself botanized once for a few days with Claret de La Tourrette and the abbé Rozier. He exchanged some specimens with Malesherbes and influenced some minor botanists such as Robert John Thornton, Henri de Cassini and Benjamin Delessert.

[74] See Duris 1993 (note 42).

[75] On the Geneva case, see René Sigrist and Patrick Bungener, 'The First Botanical Gardens in Geneva (ca. 1750–1830): Private Initiative Leading Science', *Studies in the History of Gardens and Designed Landscapes* 28 (2008), 333–350.

[76] On the development of a scientific representation of plants in the eighteenth century, see Kärin Nickelsen, 'Korrespondenzen und andere Netze: Die Konstruktion von Pflanzenbildern im 18. Jahrhundert', in Dauser et al. 2008 (note 32), 113–133.

Spaendonck, a former "painter to the king for miniatures". He was occasionally assisted in his new duties by Nicolas Maréchal and Pierre-Joseph Redouté, who would illustrate in the next few years the botanical works of Candolle, Desfontaines, Michaux, La Billardière and L'Héritier de Brutelle. Together with Bonpland, Redouté would also publish the description of the imperial gardens of Malmaison and Navarre (1813).

Despite the creation of the Museum of Natural History in Paris, and the establishment of a chair of botany at the new University of Berlin (1810), the institutional organization of botany underwent no revolution in the early nineteenth century but rather an ongoing evolution. More significant changes probably affected the related fields of agronomy and forestry. A first agrarian school equipped with an experimental station had been established in Rostock around 1789 under the lead of Franz Christian Lorenz Karsten (1751–1829) before similar institutions were created by Albrecht Thaer in Celle (1802) and in Möglin (1806). In 1810, Thaer became professor of agrarian economy at the University of Berlin and trained a whole generation of professional agronomists. In 1818, the kingdom of Württemberg created its own rural institute in Hohenheim. In France, a first attempt had been made at the end of the Old Regime with the creation of the Royal Farm of Rambouillet, managed from 1786 onwards by Henri Alexandre Tessier. A few agrarian institutes were created in the 1820s at Roville (Mathieu de Dombasle) and elsewhere. In Italy, a few universities or high schools included agriculture, rural economy and sometimes even forestry in the teaching of botany.

A final group of professionals—forestry engineers—appeared at the end of the eighteenth century in the wake of a growing concern about the problems raised by deforestation: timber famine, fuel crises, and soil erosion. In Germany, "Forstwissenschaft" came to light for the first time with the creation of the short-lived "Forstakademie" of Berlin under Frederick II (led from 1786 onwards by Friedrich August Burgsdorf). This was followed in 1816 by the "Forstakademie" of Tharandt. In France, the longstanding problem of deforestation had been tackled since Colbert's time by the administration of the "Eaux et Forêts", although with little efficiency. But formal education for foresters appeared in 1824 with the creation of the forestry school of Nancy.

PART TWO

READING AND JUDGING:
THE ACQUISITION AND EVALUATION OF KNOWLEDGE

USURPED INTENTIONS: THE RECEPTION OF ALBRECHT VON HALLER'S WRITINGS IN FRANCE

Florence Catherine

In the eighteenth century, the rapid expansion of the written word and of learned information, along with a profound urge to organise knowledge, led certain scholars to pursue a dual activity. This was the case with Albrecht von Haller, who, in addition to his activities as a scientist, also produced some 9,000 reviews, published in the *Göttingische Gelehrte Anzeigen* [GGA].[1] Haller is a typical example of the members of the republic of letters of his age in the coordinated way he used correspondence and learned periodicals.[2] His correspondence and the *GGA* are useful to illustrate the reaction of a particular author to the way his works were received and assessed by the French, since it so happens that within Haller's correspondence and reviews, the French intellectual scene is specifically identified.[3]

The idea of analysing the judgements that accompanied the reception of Haller's texts in France therefore makes perfect sense. The aim here is not to make a qualitative assessment of these judgements, but rather to look

[1] This number, established by Karl S. Guthke in *Hallers Literaturkritik* (Tübingen 1970), is also to be found in Claudia Profos Frick, *Gelehrte Kritik. Albrecht von Hallers literarisch-wissenschaftliche Rezensionen in den Göttingischen Gelehrten Anzeigen* (Basel 2009); for Haller's reviews of scientific publications, see: Hubert Steinke, *Irritating Experiments. Haller's Concept and the European Controversy on Irritability and Sensibility, 1750–90* (Amsterdam and New York 2005), 251–265.

[2] Hubert Steinke, 'Der Patron im Netz. Die Rolle des Briefwechsels in wissenschaftlichen Kontroversen', in Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005), 441–462; Martin Stuber, 'Journal and Letter. The interaction between two communication media in the correspondence of Albrecht von Haller', in Hans-Jürgen Lüsebrink and Jeremy Popkin (eds.), *Enlightenment, Revolution and the Periodical Press* (Oxford 2004), 114–141.

[3] See, for example: Anne Saada, 'Les relations entre A. von Haller et la France observées à travers le journal savant de Göttingen', in Michèle Crogiez Labarthe, Sandrine Battistini and Karl Kürtös (eds.), *Les écrivains suisses alémaniques et la culture francophone au XVIII^e siècle. Actes du colloque de Berne, 24–26 novembre 2004* (Genève 2008), 175–191; Roselyne Rey, 'Diderot à travers la correspondance entre Haller et Bonnet', in Anne-Marie Chouillet (ed.), *Les ennemis de Diderot* (Paris 1993), 113–126; François Jost, 'Albert de Haller: critique des écrivains français', *Revue de littérature comparée* 32 (1958), 12–33; Charly Guyot, 'Albert de Haller et Charles Bonnet: juges de l'Encyclopédie', in *Literature and Science: Proceedings of the 6th Triennial Congress Oxford 1954* (Oxford 1955), 205–212.

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at the mechanisms through which knowledge was received and appropriated. The entire range of these questions was examined in a doctoral thesis, entitled *The Practice and the Scholarly Networks of Albrecht von Haller (1708–1777): Vectors of Cultural Transfer between the French and German Spheres in the 18th Century*.[4] In the present instance, however, the extraordinary breadth of the subject calls for restricting the corpus under consideration to those medical texts by Haller that were translated into French,[5] as well as two scholarly journals, the highly regarded *Journal des Savants*[6] and the *Journal de Médecine, Chirurgie et Pharmacie*,[7] established in 1754, of which Charles-Augustin Vandermonde (1727–1762), professor of medicine [docteur regent] at the University of Paris, soon became the principal editor. The following discussion pursues two major endeavours: to detect the intellectual and mental assumptions which guided the French readers of Haller's texts, and to assess the ways in which knowledge was appropriated and what was at stake. Evidence of how his texts were judged, as well as the reasons why they might have been appropriated and the ways in which this occurred can be found in his correspondence, in reviews, and in the prefaces to the French translations of Haller's writings. The summaries and reviews published in the *Journal de Médecine* and the *Journal des Savants* provide a basis, first of all, to examine how writers of reviews summarised, selected, and evaluated knowledge. The French editions of Haller's writings throw light on the aims of the French intermediaries who wanted to adopt and disseminate the content. Finally, in a rather novel mise en abyme, the reviews published by Haller in the *GGA* tell us how the author reacted to the way in which his work was being used.

The Art of Reviewing: Description, Selection, and Assessment

Haller's major works in the field of medicine were always the subject of reviews in the *Journal des Savants* or the *Journal de Médecine*. The type

[4] Florence Catherine, *La pratique et les réseaux savants d'Albrecht von Haller (1708–1777), vecteurs du transfert culturel entre les espaces français et germaniques au XVIII^e* (Paris 2012).

[5] For another example of a restricted corpus, see Gabriel Cunche, *La renommée de A. de Haller en France: influence du poème des alpes sur la littérature descriptive du XVIII^e siècle* (Neuchâtel 1921).

[6] It is worth pointing out that Haller himself wrote the review of his *Opera minora emendata* (1763–1768) in the following volumes of the *Journal des Savants* (September 1768), 659–666; (November 1768), 794–798; (January 1769), 16–21.

[7] For the sake of simplicity we will refer to it here as the *Journal de Médecine*.

of reader that interests us here is the writer for the educated press who has specific aims in mind when reviewing a work. This writer of reviews reads in a targeted and selective way, because his purpose is both to give a broad readership instructions that will guide them in their reading of the text under review and, occasionally, to offer his own opinion about the knowledge presented there.

The reviews of Haller's works that appeared in the *Journal des Savants* are of different lengths, ranging from the mere announcement of a publication to extracts, but on occasion more detailed articles provide information not only about the content, but also about the intentions and the epistemological framework surrounding the writing of the work. When *Deux Mémoires sur le mouvement du Sang* (1756)[8] appeared, the reviewer gave an outline of Haller's text, purpose, and ambitions, as well as of the scientific methodology adopted during the conduct of the research.

Since it was customary for a work to start with a preface or foreword that enabled the author to explain his aims and the audience he was addressing, the reviewer was bound to read it.[9] The journals gave the French public an outline of Haller's initial aims by summing up his prefaces. For the *Journal de Médecine* this was, indeed, one of the essential purposes of a review: "In our first extract we have presented the goal M. de Haller set himself in publishing this new Physiology . . ."[10] The reviewer was then in a position to establish whether the writer of the original work had succeeded in achieving his goal. In its consideration of the ambitiously encyclopaedic *Elementa Physiologiae*, the *Journal de Médecine* outlined the design which Haller had presented in his preface, before going on to state where he had failed to meet it, while at the same time admitting that the physiologist himself had realised how very difficult it would be to fulfil his plan.[11]

The epistemological framework of Haller's works, in particular the great importance he attached to experimental evidence, was clearly understood

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[8] *Journal des Savants* (May 1757), 290.

[9] This idea is explicit in the review of the first four volumes of the *Elementa Physiologiae Corporis humani* (Lausanne 1757–1762), published in the *Journal de Médecine* 18 (1763), 103: "To demonstrate how far he was suited to fulfil this task, M. de Haller first sets out in his Preface the knowledge such an enterprise presupposes in the person who wishes to undertake it." See also the review of the *Dissertation sur les parties irritables et sensibles des animaux*, translated by Tissot (1755), published in the *Journal des Savants* (1755), 227: "M. Tissot, who is the Translator, has added a Preface at the beginning, intended to celebrate the importance of this discovery."

[10] *Journal de Médecine* 18 (1763), 195–196.

[11] Ibid., 99–111.

by the reviewers. The *Journal des Savants* and the *Journal de Médecine* did not always expound Haller's work merely by writing it up, and the author's positions were often placed in the context of the controversies accompanying the reception of his writings.[12] A whole range of formulae was used to reflect faithfully the intellectual rigour of the author, be it the distance he placed between the experimenter and the object of his research: M. de Haller "suspects",[13] or "purports to deduce from his experiments";[14] or be it a confident defence of his results: Haller "proclaims", "concludes" or even "affirms, contrary to the general opinion of physiologists".[15]

Reviews assessed not only the methodology, but also the content and the results. For example, however laudable the experiments of the Bernese scholar on the flow of the blood, the *Journal des Savants* judged them nonetheless to be of little value.[16] Similarly, however objective it might claim to be, a review is never neutral, and the evaluation of knowledge is subject to the intellectual position of the reviewer. After a summary of the main conclusions comes the verdict, sometimes positive: "M. de Haller has made some interesting discoveries about the vessels of the bones";[17] and sometimes sceptical: "... we do not believe that one can draw such firm conclusions as M. de Haller does ..."[18] When the author of the review is himself a scientist, confident in his own learning and with the benefit of his scientific activity, he becomes an arbiter of knowledge; this was the case with Vandermonde[19] or the editors of the *Journal des Savants*, several of which were members of the Academy of Sciences. Thus, on the subject of the *Deux mémoires sur le mouvement du sang* (1756), the journal reported: "We have already pointed out in our Journal of September 1755, in a review of M. de Haller's work, that it was difficult to conclude anything certain from it. Fresh experiments, conducted in the presence of one

[12] See the dispute with Lamure over the dating of the experiments, or Haller's stance in calling for less use of bleeding, contrary to the advice of the French physician Jean-Baptiste Silva.

[13] *Journal des Savants* (May 1757), 292.

[14] *Journal de Médecine* 10 (1759), 4–11.

[15] *Journal des Savants* (May 1757), 296–302.

[16] Ibid., 302.

[17] *Journal de Médecine* 10 (1759), 9.

[18] *Journal des Savants* (May 1757), 299.

[19] *Journal de Médecine* 10 (1759), 4. On the subject of the *Deux mémoires sur la formation des os* (1758), the editor offered his opinion to the reader early on, saying at the very beginning of the review: "The experiments he has just published, even if they are not decisive, deserve at least careful attention."

of our number, (M. Lavirotte, Docteur-Régent of the Faculty of Medicine) have since clearly confirmed our ideas . . ."[20]

Reviews thus helped the reader to find his way in the field of knowledge, and rendered the work under review ready for his use.[21] In this sense the review had taken on such a fundamental role within the learned world that on two occasions Haller, when involved in fierce polemics, accused his opponents—François Boissier de Sauvages[22] in one case and Jean-Baptiste Sénac[23] in the other—of knowing his work only at second hand, through what Vandermonde's journal had said of it.[24] Enlightened minds followed the latest scientific and literary publications by consulting the excerpts and reviews published in the periodicals, which led them to believe, wrongly, that they did not need to read the full texts of books that were appearing in ever increasing numbers. Etienne Housset (1733–1810), a physician from Auxerre, furnished proof of this when he confided to Haller that he had read an excerpt of his *Opera minora* in the *Journal des Savants* but had never held the book in his own hands.[25] However, such facts also indicate indirectly just to what extent reading journals formed an integral part of a scholar's work.

If the art of reviewing was born of the personal initiatives of scholars wanting to provide themselves with an easily accessible and usable list of

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[20] *Journal des Savants* (May 1757), 302.

[21] Ibid., 290.

[22] François Boissier de Sauvages de Lacroix (1706–1767) is one of the great names of the University of Montpellier, where he studied botany and obtained a doctorate in medicine. In the spirit of Sydenham and inspired by the methodology used by botanists, the physician drew up a classification of illnesses under the title *Nosologia methodica sistens morborum classes, genera et species, juxta Sydenhami mentem et Botanicorum ordinem* (1763) which became the basis of methodical nosology. Since he understood the soul as a vital principle, Sauvages could not envisage human life independent of it, and, unlike Haller, refused to accord to matter the properties of irritability and sensitivity.

[23] Jean-Baptiste Sénac (c. 1693–1770), a doctor of medicine, practised in Paris, where he was appointed Assistant Anatomist (1723) and later Veteran Associate (1741) of the Academy of Sciences. Physician to the Marshal Maurice of Saxony, he also took on the position of personal physician to the king in 1752. The success of his *Traité sur la structure du cœur* (1749) was all the greater for considering the anatomy, the physiology and the pathologies of the heart. His view that the contraction of the muscular membrane of the arteries proves their irritability conflicted with that of Haller.

[24] Letters from Haller to Tissot, 14 December 1759 and 5 February 1762, in Erich Hintzsche (ed.), *Albrecht von Hallers Briefe an Auguste Tissot 1754–1777* (Bern, Stuttgart and Wien 1977), 90 and 131. Direct, personal contact with a work was a fundamental point for Haller, who saw it as a continuation of the empirical method of acquiring knowledge, see Steinke 2005 (note 2), 443–447.

[25] Letter from Etienne Housset to Haller, 2 November 1768. Burgerbibliothek Bern, *Nachlass Albrecht von Haller*.

information,[26] it was not long before the editor proceeded from working purely for himself to writing for a wider audience. The last function of a review could be to give direction to research by calling on the French scholarly community to pursue the experiments initiated by Haller; in this sense it was part of the process of knowledge production. The reviewers' invitation thus revealed the close interrelations between three types of actors in the production and assessment of new knowledge: the author, the reviewer, and the broader anonymous public,[27] who were encouraged not to remain passive, but to examine[28] and disseminate those aspects which met their approval.

But the reception of a text is not simply a matter of reading an excerpt or an assessment. Once the discovery had been reproduced and evaluated in a review, what mattered was to know how to appropriate it, make use of it, and disseminate it further.

Uses of the Text: Appropriation and Adaptation to the Area of Reception

The reception of scientific texts is the result of different practices, among which translation plays no small role. The prefaces of the French translations are of key importance here, in that they mention the purposes for which they were produced. In the foreword to *Elémens de physiologie*, the Parisian anatomist Pierre Tarin (1721–1793?) explains what prompted him to translate the *Primae lineae phyiologiae*: "This is the work I chose to use as the basis for my lessons. . . . It then turned out that most of the students wished to have it in the vulgar tongue."[29] Toussaint Bordenave

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[26] Françoise Waquet, 'De la lettre érudite au périodique savant: les faux semblants d'une mutation intellectuelle', *Dix-huitième siècle* 35 (1983), 347–359. Id., 'Pour une éthique de la réception. *Les Jugemens des livres en général* d'Adrien Baillet (1685)', *Dix-septième siècle* 159 (1988), 157–174.

[27] The same is true for Haller's literary works. See *Journal des Savants* (1751), 635. The announcement of the French translation of Haller's poetry provides an illustration: "The recent translation into French puts those who love poetry in a position to judge the poems and to make them better known." Regarding the edition of 1752, see *Journal des Savants* (1752), 186: "We leave it up to the public to judge the merit of these poems, as well as . . . their faithfulness to the German original." We may note that reviews of literary works circulated across borders; some reviews that appeared in France repeated what had been said in German journals, pointing out the traces of Swiss dialect in Haller's poems. This was the case with the *Journal des Savants* (1755), 182.

[28] This recalls the somewhat idealised concept of a scholarly and cultivated readership capable of applying reason, as evolved by Haller.

[29] *Elémens de physiologie, ou Traité de la structure et des usages des differentes parties du corps humain*, traduit du Latin de M. Haller (Paris 1752).

(1728–1782), professor of surgery, was motivated by the same idea. He explains his reasons for translating Haller's *Elémens de Physiologie* in a foreword, in which he faithfully reflects the author's intentions.[30]

The borrowings met specific needs, and Haller's encyclopaedic *Elementa Physiologiae* was published and translated in separate parts. The part covering generation, corresponding to volume seven of the original work, was made available to the French public by Guillaume Louis Piet in 1773 under the title: *La génération, ou exposition des phénomènes relatifs à cette fonction naturelle*.[31] It is not surprising that Piet, who specialised in obstetrics,[32] should have been particularly interested in this part of the *Elementa* and that, given the reputation of the author, he should have wanted to extract from it everything that it had to teach. The foreword to the translation deserves in-depth consideration, for it contains a wealth of information both about the reasons which prompted Piet to translate Haller's work on generation and about the image current in France of the characteristics associated with the writings of the Swiss scholar. In the opening lines of his foreword, Piet explains—doubtless with a touch of rhetoric—that he did not originally intend his translation for the public, but that he had made it for his own use: "When I embarked on this translation, it was in no way my design to publish it . . . my aim in translating this work was to facilitate my own reading of it, and to make myself well acquainted with it."[33] Since any reader, even one who is familiar with a foreign language, feels more at ease in his own tongue, Piet decided to copy out the Latin text in French in order to fathom out the smallest details. It was only later, convinced of the value of the work, that he decided to offer it to a broader public.

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[30] The translator also felt he needed to tell the author about his initiative. Letter of Bordenave to Haller, 5 October 1758 (Burgerbibliothek Bern, *Nachlass Albrecht von Haller*): "Sir. Allow me to present to you a new translation of your Elémens de Physiologie. The usefulness of this work, the just and well-deserved reception it has long enjoyed, prompted in me the wish that its use should be extended and that it should be made available to a greater number of readers. It was with this intention that I undertook to translate it into French. Allow me to repeat here the sentiments which I thought it my duty to make public by expressing them in the foreword."

[31] *La génération, ou exposition des phénomènes relatifs à cette fonction naturelle . . .*, trad. de la Physiologie de M. de Haller [par Piet] (Paris 1774), 2 vols. The first volume was the subject of an announcement in the *Journal de Médecine* 40 (1773), 287.

[32] He himself wrote a "Lettre de M. Piet, . . . sur quelques articles du 'Dictionnaire de chirurgie' relatifs à l'usage du forceps dans les accouchemens, impr. de Vincent, dans le *Journal de médecine, chirurgie et pharmacie*, par M.A. Roux" (April 1767), as well as a work entitled *Réflexions sur la section de la symphise du pubis* (The Hague and Paris 1778).

[33] *La génération* 1774 (note 31), I: iii.

As intermediaries, Haller's translators had the task of making his output conform to the expectations of the French public; such adaptation was regarded as conducive to dissemination. It is therefore not surprising that the preface of a French edition could present close similarities with the reviews. In the given case, it assumed the function of a critique, noting Haller's very sure taste and selective method, before justifying the need to disseminate the work. Haller's overall plan was broken down into parts, and some of his designs were assimilated into the new project, whereas others were rejected. In undertaking to translate the *Disputationes chirurgicae selectionae* (1755–1756) under the title *Collection de thèses medico-chirurgicales* (1757), Vandermonde recalled Haller's original intentions before going on to justify the interest of his own work, referring to the high price of the original edition. In order to meet the needs of the public being addressed, it was necessary, for example, to provide students with books that were easier to read, and, above all, less expensive. Aware of the material constraints facing his readers, Vandermonde decide to leave out the figures and engravings in the work wherever "the Reader's imagination can replace them."[34]

Borrowing was a kind of recycling, in that it was done to fill a gap in the area of reception. Translations of Haller's medical writings could make up for the absence of manuals in the universities. The French were much attached to the publication of catalogues of theses, since this made the students' work easier to obtain and to use, and the practice obliged young physicians to standardise their working methods and to conduct their research in a more rigorous manner.

The uses made of Haller's texts served multiple purposes: Toussaint Bordenave translated the text of the *Elementa* in order to disseminate it, rendering it as faithfully as possible, as he asserted both in his foreword and in a letter to Haller.[35] However, there are cases where translators did not follow the author's aims. Piet, for example, revised Haller's intentions, and provided a justification for the adaptation he planned to make. As such, his preface amounts to a critical analysis of the original work. If it praises Haller's experimental method, it objects to his taste for erudition

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[34] *Collection de thèses médico-chirurgicales, sur les points les plus importans de la chirurgie théorique et pratique; recueillies et publiées par M. le Baron de Haller et rédigées en François par M**** (Paris 1757), vol. 1, XI: "We shall include Figures whenever we judge them to be indispensable; but we shall omit them when we believe that the Reader's imagination can replace them."

[35] *Elémens de physiologie de M. Alb. de Haller, Traduction nouvelle du Latin en François, par M. Bordenave- 1e partie* (Paris 1769), foreword: "…I have been as exacting as I could be."

and the proliferation of details that needlessly obscure the text. Vandermonde proceeded in exactly the same way, claiming that in order to put the collection of theses into more hands, facts that were already well-known and could be found in other works needed to be pruned away:

> This is our plan; and it is by following this plan that we have succeeded in incorporating in a single 12mo Volume all the Dissertations which take up more than one 4to Volume in M. de Haller's Work. We read each Dissertation several times, and once we had to some extent mastered them, we turned the latin Piece into a shorter french Piece, where the Author himself appears to expound his ideas . . .[36]

Having explained Haller's project, in the second part of the preface Vandermonde describes his own intention: to reconstruct the content of the original work, while correcting certain faults. The critical discourse and approach of the translator make him an actor in the construction of knowledge. Convinced as he was of the usefulness of a collection of theses, he appropriated Haller's intentions and redirected them according to his own ideas. A semantic shift in the preface marks this appropriation of the text by the translator; he initially used a neutral formula to express his intention: "such is the enterprise of M. le Baron de Haller", but then included himself more explicitly, writing: "This is our plan". Vandermonde's translation ends with an annotated table containing the translator's own judgement of the style and content of the theses he has selected. Nor did he have any hesitation about changing the order in which Haller had classified the theses collected in the *Disputationes*: for example, he dropped the dissertations on the subject of the eyes from the first volume.

In the specific case of the French translations of Haller's works, the reviews note the gap between the original text and the French version, and then decide in favour of one or the other. The *Journal des Savants* emphasised the interest of Haller's *Disputationes chirurgicae selectae* and the discrepancy between it and the French edition, which it judged to be more relevant.[37] Having praised Haller's original intentions, the journal extolled the quality of the translation and the project of the translator, which it called "its Abbreviator":[38]

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[36] *Collection de thèses médico-chirurgicales* 1757 (note 34), X.
[37] *Journal des Savants* (March 1759), 175.
[38] Ibid., 159.

> We understand first of all how desirable Compendia of this sort, drawn up by a man of such enlightened taste as M. de Haller, must be to all experts in the field; but in order to make its use even more general, a Physician of Paris has very wisely judged that it would be expedient to remove from each piece what is to be found in the best-known Authors . . . in a word, to take from each Dissertation only that which belongs to it alone . . . and to translate the whole from Latin to French in order to put it within the reach of the greatest number.[39]

These new editions acted as a stimulus to French scientific endeavours, and the *Journal des Savants* " . . . calls on the French Publisher [of the *Collection de thèses médico-chirurgicales*] to issue in similar form the Dissertations on Anatomy, Physiology, and practical Medicine, which M. le Baron de Haller has already gathered into a compendium".[40] In the same way, the *Journal de Médecine* found the French version of the *Collection de thèses médico-chirurgicales* preferable to the original version which, in Latin and too costly, reached only a limited public: "The work published today avoids these two drawbacks; it is in no way inferior to the latin Collection; one may even say it is superior . . ."[41]

In fact, this game of criticism and appropriation of scientific writing reflects two concepts of knowledge. In order to address a university readership, Haller had deliberately chosen to mention in precise detail the authors his remarks referred to, and to write in Latin, a language he often preferred for his scientific publications. By the very fact of translating them, the French were criticising both the appropriateness of this choice and a concept of learned communication which they regarded as outmoded. Even though Latin may still have been heard in French lecture theatres, the students sometimes had difficulty in understanding it. So with his collection of theses, Haller offered them an effective tool for their work, but one which did not reach the greatest number. In the same way, his taste for detail, joined to an erudite understanding of knowledge, did not have the good fortune to appeal to French men of letters, as he was informed by his most prolix correspondent in Paris, the physician François Thiery,[42] whose judgement coincides with that of a number of reviews.

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[39] Ibid., 176.

[40] Ibid., 177.

[41] *Journal de Médecine* 8 (1758), 119.

[42] In his letter of 29 July 1762 (Burgerbibliothek Bern, *Nachlass Albrecht von Haller*), Thiery informed Haller that he had been criticised for including so many interpretations and citations. François Thierry (or Thiery) (1719–1793) of Lorraine, studied medicine at Pont-à-Mousson before obtaining his doctorate at the University of Paris. He practised in the capital, and was awarded the title of physician to the king. Two years spent in Spain

The scholar was sensitive to the judgements being made about his work. Let us now consider the degree of relevance Haller attached to the assessment of his work expressed in the reviews and in the translations of his publications.

The Process of Re-Appropriation: Haller as Censor of the French Editions of His Works

Haller kept himself informed about the reception of his works, either through the journals or through his extensive network of correspondents.[43] For example, it was from the physician Samuel Auguste Tissot of Lausanne that he learnt of the ambivalent verdict of the *Journal des Savants* on his experiments on the movement of the blood.[44] Concern about the fate of their work was a common attitude among scholars, and in 1773, Barthez asked Haller about the reception of one of his pieces: "If the Göttingen Gazette publishes an excerpt of my Discourse, I would be most grateful if you would send me a copy of that excerpt".[45]

Contrary to what he had said in the famous preface to the *GGA* of 1747, where he expounded the scientific purpose of reviewing and the ethics of the reviewer, Haller frequently reviewed his own works when they appeared.[46] It is worth comparing his correspondence and his reviews

(1753–1755) enabled him to carry out further research into the relationship between climatology and epidemics. On the eve of the Revolution, Thiery published his reflections on improving medical studies under the title: *Voeux d'un patriote sur la médecine en France, où l'on expose les moyens de fournir d'habiles médecins au royaume, de perfectionner la médecine et de faire l'histoire naturelle de la France* (1789). We possess 149 letters addressed to Haller between 1751 and 1777, see Odile Renée Hamon (ed.), *Contribution à l'étude des correspondants de Haller et en particulier de Thierry*, dissertation in medicine, University of Rennes, 1970.

[43] Haller was interested in the fate of his French pieces, as is shown by his letter to Johann Friedrich von Herrenschwand (1715–1798), physician to the Swiss Guards in Paris, dated 29 March 1752: "Would it be possible to know who is taking care of the French edition of my poems?" Similarly, Haller wrote to Tissot that he had not had time to correct the translation made by P. Tarin. Letter from Haller to Tissot, 16 November 1756, in Hintzsche 1977 (note 24), 55.

[44] Letter from Tissot to Haller, 16 September 1757, ibid., 59. He refers to the review of *Deux mémoires sur le mouvement du sang* which appeared in the *Journal des Savants* (1757), 290–302.

[45] Letter from Paul-Joseph Barthez to Haller, 6 October 1773. Burgerbibliothek Bern, *Nachlass Albrecht von Haller*. He is almost certainly referring to his *Oratio academica de principio vitali hominis* (Montpellier 1773).

[46] Profos Frick 2009 (note 1), 108. He reviewed his own literary works 28 times, but in fact these are mainly reviews of translations and new editions.

to understand exactly how Haller reacted to the fate of his texts abroad. However, since a writer of reviews needed to be analytical and concise, he mentioned in them only what he believed to be essential, which makes them all the more revealing about his intentions.

While he was open to scientific discussion, Haller was not at all happy when a published version did not respect the unity of his thought.[47] But his intentions must not be misunderstood: the intellectual rigour inherent in the way he wrote his reviews cannot be doubted. In any case, he never regarded knowledge as fixed, and he did not stand aloof from polemics, being always ready to refine his experiments and arguments in order to respond to his opponents. However, in this case it was not a matter of disputing with a rival, but rather of condemning changes which could be attributed to the translator. A critical review[48] was a means to refute the ways his texts had been interpreted in the French editions. In the case of the French translations of his writings, Haller judged the quality of the translation on the one hand, and the way his intentions had been respected on the other, while refraining from pronouncing judgement on the quality of the original work. In the cases we are examining here, the adoptions were seen as unwarranted and clumsy, and the modifications perceived as distortions of his thinking. It is possible to differ over the assessment and the approval of knowledge, but it is necessary to agree on the methodological assumptions. That is why Haller assigned one final purpose to his criticism: to re-establish the integrity of his intentions. The reviews enabled him to point out the distortions that had arisen from the adaptation, and then to justify his use of Latin and the importance he attached to details.

His epistemological project could sometimes be misunderstood, or distorted outright by unprincipled persons, and it was hardly acceptable that readers should find Haller's name attached to the work of a translator who had misappropriated his intentions. This is why the review of *La Génération* which appeared in the *GGA* in 1774 allowed Haller to respond point by point to the criticisms of the original text made by Guillaume Piet in

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[47] Letter from Haller to Tissot, 19 December 1754. Hintzsche 1977 (note 24), 37–38. The engraver Bousquet, who had promised Haller to produce the engravings accompanying the edition of the *Disputationes* without oiling them, went back on his word. Haller regarded this breach of trust as a serious encroachment upon a text which belonged to him.

[48] If the use of this term is debatable to describe the type of reviewing practised in French journals, we use it here deliberately to describe the specific approach to reviewing as defined by Haller.

his preface.[49] In the first place, Piet's name was not familiar to him—an elegant way of making it clear that he had not been consulted about the undertaking, and that the translator's lack of reputation did not bode well for the quality of his work. In admitting that he had found in Haller's work some "passages that are very obscure, or at least very difficult to understand",[50] Piet had cast doubt on his own abilities. A poor translator, he did not manage to convey the real content of Haller's text, which he cut drastically—and any reduction implies simplification. These improper adoptions, editings, and translations undermined Haller's ideas, which the translator had not understood: Haller backed up his contention with precise examples of Latin terms badly translated into French.[51] Whether they had arisen from a concern for economy, to produce a less costly edition than the original one, or whether they were the result of the ignorance or dishonesty of the translator, these simplifications were not acceptable because they misrepresented Haller's methodology. The *GGA* was Haller's favoured rostrum for letting his approval or displeasure be known, for he was much better placed than anyone else to judge the distance between these adaptations and the author's true ideas.[52] Nevertheless, the 1747 preface had called to mind that the reviewer should be independent, that he should not serve any private interests and certainly not his own personal ones. Haller's cleverness lies in the fact that in rebutting Piet by means of a critical review, he set himself up as an arbitrator devoid of the passions of the author, which gave him additional weight. He was not speaking in his own name, but aimed to re-establish the orthodoxy of knowledge. One of the functions of the journal is that of a scientific organ in which what matters is the truth; it is a favoured medium for the organised transmission of knowledge.

Let us now go beyond what was said explicitly in order to discover what was really at stake in Haller's reviews of these texts. In judging the uses which the French made of his texts, Haller made no attempt to understand

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[49] 'La Generation ou exposition des phénomenes relatifs à cette fonction naturelle trad. de la Physiologie de M. de Haller avec des Notes etc.', *GGA* (1774), 145–146 and 249–250.

[50] *La génération* 1774 (note 31), I: iii.

[51] Haller frequently used this procedure in his reviews. A large number of citations enabled him to support his argument from the text, and was part of his empirical-deductive method.

[52] *GGA* (1774), 145: "The translation is rather literal, and that is why it has never managed to reproduce the real sense intended by the author." [Die Übersetzung ist ziemlich buchstäblich, und eben deswegen hat er den wahren Sinn des Verfassers nicht allemal getroffen.]

the justifications they offered; the main purpose for him was to point out, to signal, the epistemological differences that lay behind the translation. Haller's review of the first volume of the Vandermonde's *Collection de thèses*[53] is a correction of the Frenchman's work. The translators had betrayed his attachment to Latin, the favoured language of men of letters. Consequently, the adaptation of his work for the French public, which also pared down its content, ran counter to his project. In claiming to reach a broader public, Vandermonde and Piet achieved the opposite effect: they provided a slimmed down version aimed at a specific, French-speaking, readership. Haller was aware of the stumbling blocks preventing a sound and complete reception of his works in a different geographical area. The objections in his reviews echo the criticisms he made more generally of the French readership: their rejection of erudition and loss of interest in Latin, while he himself was fighting against approximations and advocated the use of precise and definite vocabulary. What Haller discerned in these intentional adaptations by the French, which they went on to justify, were real methodological divergences from his work, which dealt it a double blow: it was not only the direction of his thought which was being betrayed, but also the constituent methodology of his writings.

As an author, in his correspondence with close friends, such as Charles Bonnet and Samuel Auguste Tissot, Haller expressed the bitterness and rage which he felt at the violence done to his texts. But as a reviewer, he reacted to the translation of his writings as he would to that of any other work: the chief purpose of the critical review was to offer high-quality and up-to-date information. So although he gave quite a favourable review of Bordenave's translation of his Physiology—it is worth recalling here that the latter had written to him of his admiration and loyalty—Haller expressed regret that he had used the 1751 edition of the *Primae lineae Physiologiae* and not the improved and augmented edition of 1765.[54] Here the critic was fulfilling his informative role, encouraging readers to use the new, corrected edition. Nevertheless, given that the readership of the *GGA* consisted of German speakers, and that the journal's distribution in France was certainly limited, it is highly likely that these elements

[53] *GGA* (1757), 1087–1088.

[54] *GGA* (1769), 584. This remark echoes the one formulated in Haller's letter to Bonnet of 2 August 1772: "M. Bordenave has translated my little physiology, unfortunately using the second edition, at a time when the third had already been published three years earlier…" Otto Sonntag (ed.), *The Correspondence between Albrecht von Haller and Charles Bonnet* (Bern 1983), 1036–1037.

of dialogue between Haller and those who adapted his work into French passed each other by without ever meeting.

This study, then, has made it possible to draw some conclusions and point to avenues to explore. The judgements expressed in the reviews and in the French adaptations of Haller's texts as reflected in the translations, illustrate the wide range of actors and practices that contributed to the construction of shared knowledge. In the same way, the learned periodicals performed different tasks depending on their purpose and on their editors. Under Haller the *GGA* had a more critical purpose than that behind other organs, such as the *Journal des Savants*. Moreover, if the latter often remained faithful to the tradition of providing excerpts, the *Journal de Médecine*, which was aimed at a specialist public, appeared to be more involved in the debates and discussion dividing the medical world.

In the context of the organisation of medical knowledge in the second half of the eighteenth century, excerpts were a return to the function of providing information, while reviews sometimes commented on the quality of a methodological approach. The public communication conducted through the journals thus underlines the role they played in the production of knowledge. Himself a man of science, the reviewer took an active part in this process in so far as he evaluated knowledge which deserved to be retained, while more or less implicitly encouraging the learned public to take a stance in the polemics.

Knowledge is acquired not by absorbing a piece of raw information, but by adding it, comparing it or combining it with things already known in a specific area. There is a tension between, on the one hand, the criteria according to which a verdict was passed, criteria which depended on the intellectual cast of the area in question—the use of Latin and erudition were regarded more harshly in France than in the German-speaking areas—and, on the other hand, the epistemological frameworks, which tended towards standardisation. Reviews revealed these tensions, and thus no man of science could remain indifferent to them if he aspired to gain acceptance for his ideas and, increasingly, his name.

ALBRECHT VON HALLER AS LIBRARIAN: SEARCHING AND FINDING IN THE UNIVERSE OF BOOKS

Claudia Engler

As a poet, scholar, university professor and statesman, Albrecht von Haller numbers among the most significant figures in the intellectual history of the eighteenth century. Given the many activities in which he was engaged, the fact that Haller served for a short time as a librarian in the "city library" [burgerliche Stadtbibliothek] of his home town has received little attention to date.[1] Indeed, his period of service in this post does not count among the major positions he held throughout his life. His career as a librarian lasted exactly one year—from May of 1735 to May of 1736—and can certainly be rightly understood, also from Haller's perspective, as a means of earning a living and, above all, as a temporary post and a springboard to achieving higher public office. A model for career advancement through service as a librarian had been provided by Haller's predecessor, Franz Ludwig Steiger (1704–1755), who later became a member of the Small Council [Kleiner Rat].[2] It is not easy to glean much about Haller's time as a librarian from primary sources: nothing in his writings is concerned with the practice of library science, and in correspondence during his year as a librarian, as well as in later correspondence, he is silent about questions pertaining to the organisation of libraries, save for his own private library. His successors in the city library—Samuel Engel (1702–1784) and Johann Rudolf Sinner (1730–1787), with whom he had regular contact—praised their predecessor above all as the "celebrated

[1] Hans Bloesch, 'Albrecht von Haller als Bibliothekar', in *Mélanges offerts à M. Marcel Godet* (Neuchâtel 1937), 165–178. Haller's role as an owner of a private library is discussed in Urs Boschung, '"Mein Vergnügen … bey den Büchern." Albrecht von Hallers Bibliothek—von den Anfängen bis 1736', *Librarium* (1995), 154–174; Ursula Pia Jauch, 'Von der Einsamkeit eines Büchersammlers—Albrecht von Haller. Nachtgedanken zum Verhältnis von Buch und Welt', in Joseph Jung (ed.), *"… am literarischen Webstuhl …" Ulrico Hoepli, 1847–1935: Buchhändler, Verleger, Antiquar, Mäzen* (Zürich 1997), 279–289; Barbara Braun-Bucher, 'Hallers Bibliothek und Nachlass', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Bern 2008), 515–526: 515–518. Haller's private library, which was sold to Milan after his death, has been reconstructed: Maria Teresa Monti (ed.), *Catalogo del Fondo Haller della Biblioteca Nazionale Braidense di Milano* (Milano 1983–1994), 13 vols.

[2] Bloesch 1937 (note 1), 166.

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doctor of medicine" who, in addition to his many scientific activities—or so one is inclined to conclude—had been forced to engage in an activity not commensurate with his status.[3] Inferences about the details of Haller's activities as a librarian can be directly deduced only from the minutes of the meetings of the library commission—meetings which he was obligated to convene as secretary of the commission and which, by contrast with all of his predecessors and successors, he conducted in an efficient fashion that was unfortunately brief—and from one slim volume of an alphabetical catalogue of the library's printed collection that he had begun during his year there.[4]

Given this paucity of information, the question arises of why Haller is of interest as a librarian at all. First of all, books and libraries were central elements in his private and scholarly lives: as the son of a printing and publishing family, owner of a substantial private library, avid reader, author of numerous books, library user, bibliographer and reviewer, Haller was thoroughly familiar not only with the contents of books but also with everything pertaining to their production and use. In all these functions, one thing in his relation to books remained constant: making them available and using them. Use, in practice, ultimately means compilation and above all systemisation. For Haller, systematic arrangement was a central factor in the success of scientific endeavours.[5] A library is the place par excellence for order and precise location.[6] Moreover, the early Enlightenment—characterised by increasing production of books, new forms of book-related media, and changes and innovations in the types of libraries—was a universe of books at the dawn of a new era. The

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[3] Samuel Engel, *Histoire de la Bibliothèque de Berne*, BBB Mss.h.h.III.49 (1743), IV/16, 23; Johann Rudolf Sinner, *Bibliothecae Bernensis librorum typis editorum catalogus* (Bern 1764), LII.

[4] *Bibliotec-Manual No. 1* (*1579–1776*), BBB Mss.h.h.XLI.15.1, 109–120; *Manual der Bibliothec-Commission 1726–1748/1774–1784*, BBB Mss.h.h.XLI 16, 25–27; *Biblici 1736*, BBB Mss.h.h.III.102.

[5] Otto Sonntag and Hubert Steinke, 'Der Forscher und Gelehrte', in Steinke et al. 2008 (note 1), 317–346: 330f.

[6] Ulrich Johannes Schneider, 'Ordnung als Schema und als Operation. Die Bibliothek Herzog Augusts', in Peter Gente (ed.), *Foucault und die Künste* (Frankfurt/M. 2004), 315–338; Ulrich Johannes Schneider, 'Der Ort der Bücher in der Bibliothek und im Katalog am Beispiel der Wolfenbütteler Büchersammlung', *Archiv für Geschichte des Buchwesens* 59 (2005), 91–104; Frank Büttner, Markus Friedrich and Helmut Zedelmaier, 'Zur Einführung', in Frank Büttner, Markus Friedrich and Helmut Zedelmaier (eds.), *Sammeln, Ordnen, Veranschaulichen. Zur Wissenskompilatorik in der Frühen Neuzeit* (München 2003), 9–12; Helmut Zedelmaier, *Biblioteca universalis und bibliotheca selecta. Das Problem der Ordnung des gelehrten Wissens in der frühen Neuzeit* (Köln, Weimar and Wien 1992), 51–64.

university library in Göttingen became the epitome of the new "modern scientific research library".[7] Even if it was not an "Enlightenment library" in the sense "that the literature of the Enlightenment which emanated from it had a significant impact on the epoch",[8] Göttingen nonetheless marks the culmination of a demand for "public" libraries as tools of research that had arisen during the scientific movement of the late seventeenth century.[9] This "bright star in library heaven"[10] appeared simultaneously with another bright star—Haller—in Göttingen in 1736. Thus the question to explore is what demands Haller as a librarian made on the city library of Bern, and whether his experiences as a practising scholar were translated into changes in library organisation, particularly by comparison with the library in Göttingen.

The City Library of Bern in the Early Eighteenth Century

The library that Haller was chosen to head in May of 1735 corresponded closely to what Bernhard Fabian characterised as the "dim background"[11] of the "bright star" in Göttingen. Founded in 1535 as the library of the "Superior school" [Hohe Schule]—a college mainly for the education of ministers and lawyers—and soon outstandingly equipped through incorporation of important private libraries, it attracted scholars and students to Bern in its first decades.[12] At the end of the sixteenth century, but certainly during the course of the seventeenth century, it lost its function as a college library. It became a Wunderkammer and a cabinet of rarities, developing from a specialised theological library into a baroque universal library, and from an arsenal in religious battles to a theatre of knowledge

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[7] Uwe Jochum, *Kleine Bibliotheksgeschichte* (Stuttgart 2007), 112.

[8] Bernhard Fabian, 'Bibliothek und Aufklärung', in Werner Arnold and Peter Vodosek (eds.), *Bibliotheken und Aufklärung* (Wiesbaden 1988), 1–19: 5.

[9] Bernd Fabian, 'Göttingen als Forschungsbibliothek im 18. Jahrhundert', in Paul Raabe (ed.), *Öffentliche und private Bibliotheken im 17. und 18. Jahrhundert. Raritätenkammern, Forschungsinstrumente oder Bildungsstätten?* (Bremen and Wolfenbüttel 1977), 209–239: 213.

[10] Fabian 1988 (note 8), 5.

[11] Ibid., 5ff.

[12] Claudia Engler, 'Anstatt Geschütze und Spiess steht nun eine gewichtige Bibliothek da', in André Holenstein (ed.), *Berns mächtige Zeit. Das 16. und 17. Jahrhundert neu entdeckt* (Bern 2006), 284–288 (and 273); Hans Strahm, 'Die Berner Bibliothek von ihren ersten Anfängen bis zur grossen Reorganisation von 1693', in Burgergemeinde Bern (ed.), *Bibliotheca bernensis* 1974 (Bern 1974), 13–43.

[theatrum sapientae].[13] This development was abetted not least by the gift of the private library of the French diplomat Jacque Bongars (1554–1612) in 1632. With its approximately 500 handwritten documents and 7,000 printed works, this collection almost doubled the size of the city library's previous holdings;[14] moreover, Bongars's library was considered already during his lifetime to be among the most important private humanist libraries of the day. The now universal structure of the library was directly related to a change in the exalted self-concept of the Bernese authorities, who alienated it from the college and made it an element of showy governmental representation and an instrument for enhancing the infrastructure of the state.[15] This development culminated in the construction of a new Great Room in 1695 (see fig. 1), the creation of a new catalogue, a donation book, and the employment of a librarian to replace the college professors who up to that point had run the library on the side, in addition to their other duties.[16] Donations were received in abundance following this reorganisation, soon overwhelming a library that was not designed for growth. Books and museum objects were piled in side rooms without being catalogued. The library manual soon referred to "rather chaotic" circumstances and the librarian in charge eventually refused to conduct visitors through the overfilled, disorderly library,[17] which no longer even served a representational purpose.

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[13] Claudia Rütsche, *Die Kunstkammer in der Zürcher Wasserkirche. Öffentliche Sammeltätigkeit einer gelehrten Bürgerschaft im 17. und 18. Jahrhundert aus museumsgeschichtlicher Sicht* (Bern 1997), 239–260; Susanne Ritter-Lutz, 'Die bernische Kunstkammer im 18. Jahrhundert', in Benno Schubiger (ed.), *Sammeln und Sammlungen im 18. Jahrhundert in der Schweiz* (Genf 2007), 47–66.

[14] Martin Germann, 'Die Bongarsiana', in *Die Burgerbibliothek Bern. Archiv, Bibliothek, Dokumentationsstelle,* ed. by Burgerbibliothek Bern (Bern 2002), 93–120.

[15] Johann Rudolph Rodolph, 'De Bibliotheca civica, nuper Illustriss. Procerum mandatu ad usum publicum instaurata', in *Dissertatio propaedeutica pro inauguranda theologiae didactico-elenchtiae cathedra altera* (Bern 1699), annex. The representational character of the library was clearly the main priority, a fact that is also confirmed in travel accounts: Claudia Engler, 'Verbreiten und verbieten: Bibliotheken, Lesegesellschaften, Verlagswesen und Zensur', in André Holenstein (ed.), *Berns goldene Zeit. Das 18. Jahrhundert neu entdeckt* (Bern 2008), 414–419: 414. Jochum 2007 (note 7), 108.

[16] Claudia Engler, 'Zentralbibliothek der Universitätsbibliothek Bern', in *Handbuch der Historischen Buchbestände in der Schweiz* (print version), ed. by Zentralbibliothek Zürich (also available online through the website of the Zentralbibliothek Zürich URL: www .zb.unizh.ch).

[17] *Bibliotec-Manual No. 1* (note 4), 50.

Fig. 1. Meeting of the library commission in the new Great Room of the library: The books, categorised in twelve subject areas, do not conform exclusively to a scientific systemisation but visualise the hierarchical structure of the world. The resulting universe is closed in itself and the realm of knowledge is finite; there is virtually no space for new books. Oil on canvass by Johannes Dünz (1696), Burgerbibliothek Bern.

Haller as a Librarian

Albrecht von Haller took up his post at the city library of Bern in May of 1735.[18] His first appearance in the library commission was a notable one. The agenda was already made clear in the first sentence of the minutes written in his own hand. His duty as librarian, according to the official description of his job—"to bring benefits to the library and prevent harm from coming to it"[19]—he adeptly assigned to the commission, which he saw as responsible for making sure that "the library entrusted to them was maintained in the best possible condition for the use of the citizenry and for the benefit of science."[20] Haller then went on to specify what he meant by "the benefit of science":

[18] Bloesch 1937 (note 1), 167–169.
[19] *Bibliotec-Manual No. 1* (note 4), 77.
[20] Ibid., 109f.

First, the library commission should procure a "goodly sum"[21] from the higher authorities for new acquisitions, a request he soon followed up with a list of recommended acquisitions.[22] Second, he requested permission to create a new catalogue. With his characteristic vigour and decisiveness, Haller sought to free the library from stagnation and disorganisation by means of two processes: continually expanding the library's holdings, and making the knowledge contained there accessible by means of an exemplary catalogue—both key elements in the practical value of a library.[23]

New Acquisitions

Acquiring new holdings is not per se a sign of progress. A representative library also expands, although its goal is collection and possession. Accordingly, the library of Bern had encouraged gifts with the establishment of a donation book in 1693. The decisive factor, however, is the qualitative concept being pursued. Do new acquisitions depend on random gifts, or is there a deliberate effort to acquire important new scientific works? Unfortunately, the list of recommended acquisitions that Haller gave to the commission has not survived, but its general direction can be discerned. According to Haller, the supply of "older books"[24] was fairly complete thanks to the Bongars donation. However, there was a lack of "new and valuable works . . . dealing with the sciences", "new books that have been printed recently."[25] In seeking to acquire "valuable" works, Haller did not mean representative works but books whose size and price made them difficult to acquire on a private basis. "New" works—which can be taken to mean significant core works in individual scientific disciplines—were needed because they simultaneously documented and made possible the progress of science. Haller wanted to achieve in Bern what later became the foundation of the uniqueness and success of the university library in Göttingen: comprehensiveness and usefulness based on deliberate expansion of the collection in the service of the sciences.[26] He obviously saw

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[21] Ibid.
[22] Ibid., 114.
[23] Fabian 1977 (note 9), 213–218.
[24] *Bibliotec-Manual No. 1* (note 4), 197.
[25] Ibid., 112.
[26] Gerhard Streich, 'Die Büchersammlungen der Göttinger Professoren im 18. Jahrhundert', in Paul Raabe (ed.), *Öffentliche und private Bibliotheken im 17. und 18. Jahrhundert. Raritätenkammern, Forschungsinstrumente oder Bildungsstätten?* (Bremen and Wolfenbüttel 1977), 241–299: 248ff.

the library once again for what it had been at the time of its founding—a college library that contained earlier as well as contemporary scientific works in individual disciplines but was understood as complementing the scientific specialty library, i.e. the private library.[27] This was also precisely the function of the Göttingen library in its first decades. As a scientific research library it replaced the private library only in the second half of the eighteenth century. By contrast with Göttingen, the Bern library was able to build on an excellent foundation of bequeathed knowledge, thanks to the Bongars donation, thereby guaranteeing the traditionalisation and continuity of knowledge acquisition.[28] In Göttingen, where the library emerged virtually from nowhere, the foundations first had to be gradually laid by gifts and deliberate purchases of antiquarian books (one is reminded of the Bülow and Uffenbach libraries).[29]

For new acquisitions, the Göttingen library relied on close cooperation with the university's professors—another factor contributing to its later success.[30] It cannot yet be said to what extent Haller's work in Bern also followed this course. However, half of the members of the library commission, the authority to which he reported, were professors at the college, who were required, according to their official duties as stipulated in 1726, to appoint special inspectors from each faculty "who were charged in particular with specialised acquisition for each faculty."[31] Although these prerequisites for cooperation existed, there is no indication that this responsibility was ever exercised during Haller's time as librarian or at any time since the re-organisation of the library at the end of the seventeenth century. The dual function of professors appears to have been more of a formality than a reality. Nevertheless, in his first sentence in the minutes, Haller resorted specifically to this cooperation. There was also a need to act because a student reading society had been founded within the college in 1730 and was increasingly competing with the city and college library. This tightly organised, specialised theological and legal library had contained the latest literature and periodicals from the outset and,

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[27] Fabian 1977 (note 9), 216.

[28] Thomas Fuchs, 'Barocke Wissensordnung und aufgeklärter Denkstil', *Bibliothek und Wissenschaft* 41 (2008), 3–15: 6.

[29] Christiane Kind-Doerne, *Die niedersächsische Staats- und Universitätsbibliothek Göttingen. Ihre Bestände und Einrichtungen in Geschichte und Gegenwart. Mit einem Beitrag von Klaus Haenel über die Handschriftenabteilung* (Wiesbaden 1986), 11–13.

[30] Jochum 2007 (note 7), 114; Jürgen Voss, 'Bibliothekare als Gelehrte und Wissenschafter im Zeitalter der Aufklärung', in Arnold and Vodosek 1988 (note 8), 185–205: 199.

[31] *Bibliotec-Manual No. 1* (note 4), 76.

above all, enjoyed the goodwill and support of the professors. From 1735 onwards, it not only received considerable donations, including, in particular, gifts from the circle of professors who were members of the city library commission; it also received regular financial contributions from the college [Schulsekel] at the expense of the city library.[32] In addition to this competition, without being integrated anew into the local scientific activities, the library faced the risk of ending up as a repository.

Haller's proposals for library acquisitions met with resistance from the higher authorities. The suggestions on his list were turned down with the explanation that "for sufficient reasons, their Graces cannot understand that for the embellishment of the local library the latter should need to be furnished with new books."[33] Refusing to give up, Haller shortened the list and stipulated a specific amount to be spent. He went over this again and provided supporting evidence, but not without "energetic presentation of the need for this purchase."[34] Just how energetic this presentation may have been can be inferred from Haller's known temperament. Ultimately, he was successful. The shortened list was approved in May of 1736[35]—too late, however, if it was meant as an attempt to keep Haller in Bern: he was already on his way to Göttingen.

The New Catalogue

The second undertaking that Haller initiated after taking up his post as librarian was the creation of a new catalogue. The commission gave him approval, already at its second meeting in November of 1735, for "a small alphabetical catalogue" that he could compile "at will" and create "at his pleasure," and for which he would receive an advance from the library fund [Bibliothekssekel][36]—cataloguing was not among the ordinary duties of a librarian, which was the case in other contemporary libraries as well. The cataloguing work had to be preceded by a complete re-shelving of the holdings, since books received as donations over the previous 40 years had not been integrated into the library. This was an immense project,

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[32] François de Capitani, 'Die Berner Societas studiosorum im 18. Jahrhundert', in Bernard Nicolai and Quirinus Reichen (eds.), *Gesellschaft und Gesellschaften* (Bern 1982), 227–243; Engler 2008 (note 15), 416.

[33] *Bibliotec-Manual No. 1* (note 4), 112.

[34] Ibid., 120.

[35] Ibid.

[36] Ibid., 111.

but Haller succeeded in reordering the biblical holdings within half a year. His successor, Samuel Engel, continued his work and completed it in 1740, adding an additional eight volumes to Haller's catalogue project.[37] Haller's new catalogue focused entirely on application and use: he conceived a separate alphabetically catalogued volume for each subject. The volumes were light and easy to handle despite their folio format—"small" especially by contrast with the two-volume leather-bound catalogue of 1697.[38] This *Catalogus librorum Bibliothecae Civicae Bernensis* compiled by Marquard Wild (1661–1747) not only contained an allegorical title page by the Bernese artist Wilhelm Stettler (1643–1708) and an introductory dedication, but was designed for representational purposes with other decorative elements as well. Haller's catalogue volume, by contrast, lacked all representational elements: bound in paperboard covered with parchment, it gave precedence to the documentary function. A few years later, the curator of the library in Göttingen, Georg Matthiae (1708–1773), arranged his catalogue volumes in a similarly functional fashion—i.e. in single volumes according to subject.[39] Haller's catalogue, again by contrast with Wild's, was designed for expansion: large spaces were left between the titles listed to allow for later entries, and space was also preserved on the right-hand page for additional entries. Organising a catalogue this way made a separate accession catalogue superfluous; new titles could be rapidly integrated, and the catalogue remained current. A few years later in Göttingen, Georg Matthiae further expanded the potential for adding to a bound catalogue by interleaving his catalogues with empty pages.[40] Haller also included the location of books in his catalogue, thus creating a general catalogue [Catalogus generalis]. Although this was not his own invention, it was new for the library in Bern, and practical because it was now no longer necessary, as previously, to consult at least two catalogues (the shelf catalogue and the alphabetical or systematic catalogue) in order to locate a book. Since he was simultaneously re-shelving the books, Haller gave each one a new call number. He corrected gaps or erroneous entries

[37] Albrecht von Haller, *Biblici*, BBB Mss.h.h.III.102 (1736); Samuel Engel, *Patres, Juridico-politici, Medici, Philosophica, Mathematici, Litteratores, Poetae, Manuscripta*, BBB Mss.h.h.II.103–110 (1737–1740).

[38] Marquard Wild, *Catalogus Catalogus librorum Bibliothecae Civicae Bernensis*, BBB Cod. A 4 (1697).

[39] Systematic catalogue in 83 volumes, 1743–1755, and 10-volume alphabetical catalogue, 1740–1743: Kind-Doerne 1986 (note 29), 52 and 61.

[40] Ibid., 52. Regarding the search for a "Catalogus perpetuus", see also Ladislaus Buzas, *Deutsche Bibliotheksgeschichte der Neuzeit (1500–1800)* (Wiesbaden 1976), 149.

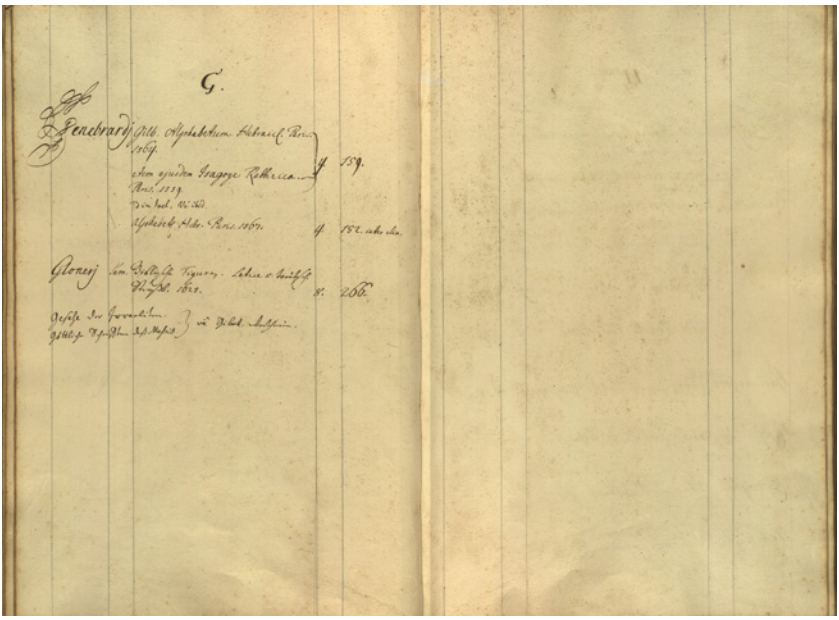

Fig. 2. Excerpt from Albrecht von Haller's catalogue volume with hand-written entries added later by his successors. Burgerbibliothek Bern (Biblici 1736, Mss.h.h.III. 102, Rubric G).

in Wild's catalogue in his own catalogue where possible. Entries followed a clear and concise pattern: author, title, place of printing, year of publication, number of volumes, format, and call number (see fig. 2). Numerous multiple entries made searching easier: translations of the Bible in German could be found under the translator's name (e.g. Piscator under "P") as well as under the title "Biblia deutsch". This constituted a rudimentary form of a combined alphabetical author and subject catalogue with subject headings. With the aid of such a catalogue, not only the librarian, but also the educated user, student or professor who knew what he was searching for could find it rapidly. Gottfried Wilhelm Leibnitz (1646–1716) in Wolfenbüttel had compiled his alphabetical catalogue in a similar fashion but as a general catalogue;[41] Haller probably knew of Leibnitz's catalogue from his visit to the Herzog August Library in 1726.[42] However, the library regulations in Bern prohibited users fetching books directly from

[41] Ibid., 146f. On the difficulties of finding: Schneider 2005 (note 6), 94.
[42] Boschung 1995 (note 1), 159.

the shelves; as in other contemporary libraries, the librarian remained the intermediary between book and reader.

Haller retained the rough systematic classification of Wild's catalogue, but reduced the number of subjects from twelve to eight and made a separate catalogue of handwritten documents. In doing so, he conformed the subject classification to the subjects taught—and hence the chairs—at the college of Bern at that time.[43] Haller did not aim to produce a precise classification. This was indicated not least of all by the assignment of call numbers—something that was long postponed in Göttingen, for example, apparently in order to avoid laborious assignment of new call numbers and corrections to the catalogue during likely optimisations of shelving. Haller's classification was thus designed for the long term; new acquisitions were simply "added on" according to format. It was not the arrangement or location of knowledge on a shelf, i.e. not topography, but the accessibility of knowledge through the catalogue that was important to him. This is noteworthy especially as the trend at the time was towards making the systematic catalogue absolute. Epistemological and physical convergence of the systematic catalogue and the shelving was considered to be the major achievement at Göttingen.[44] Haller, by contrast, separated library concerns from scientific and research concerns, perhaps for very practical reasons: creating a precisely systematised scheme is time-consuming and of little practicality. Searching and finding in the universe of books can ultimately be done without a shelving system; the decisive factor is the call number. It is also interesting to consider the "catalogue" Haller compiled for his private library in 1735, precisely at the time he was preparing the catalogue for the city library.[45] He assigned no call numbers but created an inventory of books according to their location on the shelves; books were grouped in different cabinets, approximately by subject area. On the other hand, the details listed for each book were considerably more precise than in the city library. Along with the main bibliographic information he also noted the publisher, the number of sheets, full-page illustrations, and, above all, the purchase price: his private library was a continually updated collection that he managed in business-like fashion by means of purchases and sales.

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[43] Ulrich Im Hof, 'Hohe Schule—Akademie—Universität: 1528–1805–1834–1984', in *Hochschulgeschichte Berns 1528–1984* (Bern 1984), 25–127: 37.

[44] Harald Kleinschmidt, 'Vom System zur Ordnung', *Libri* 36 (1986), 126–159: 130ff.

[45] Albrecht von Haller, *Judicia 1736/36*, BBB N Haller 63, 157r–169r; Boschung 1995 (note 1), 170f.

Conclusion

Beyond his efforts to make new acquisitions and prepare a catalogue, we know nothing more about Haller's activities as a librarian. Nor do we know whether he fulfilled the other duties with which he was charged according to the official terms of his employment; these included keeping the library tidy, supervising its opening and closing, serving its users, organising library lending and library personnel, escorting outside visitors through the library, and "energetically engaging in the study of library science and numismatics."[46] These are all duties that more or less correspond to those of other contemporary librarians. We also do not know what qualifications ultimately recommended Haller for the post of librarian: was it the network of his predecessor's relations, or his own adeptness in bringing new order to the medallion cabinet in the months prior to his appointment? Or did the authorities hope to enhance the library's reputation by naming an already celebrated poet and promising physician?[47] By contrast with his successor, whose knowledge of language and literature was thoroughly scrutinised, Haller did not have to submit to any examinations. The post of librarian offered him an adequate income while he continued to practice as a physician and operate his anatomical theatre on the side. Although these additional occupations were nothing exceptional, they nonetheless provided a decisive contrast to the librarian's job in Göttingen, which was filled by professors working on the side and hence remained closely connected to the university. This was what ultimately facilitated the unique interconnections among library, university, learned journals and academies, and laid the foundations for the library's functions. All these elements were lacking in Bern.

Haller operated in a world of libraries undergoing change and sought, for his part, to advance the library in Bern through growth based on deliberate selection, but not by reorganising the system of scientific knowledge. There would be no unnecessarily complex catalogues with reference systems; instead, the goal was targeted searching and finding and re-integration of the library into the scientific activities of the college. In accordance with his practice-oriented conception of science, he saw the library in terms of use. It should be just as much a working tool as the private library was. But order was the prerequisite for use, as the

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[46] *Bibliotec-Manual No. 1* (note 4), 79.

[47] Bernd Reifenberg, *Lessing und die Bibliothek* (Wolfenbüttel 1995), 21.

young Haller already noted observantly in his diary concerning his visits to libraries during his travels. He judged the private library assembled by Crenius in Leiden to be "a dreadful number of books in real disorder—he has written nothing down during his entire life". He found the royal library in Paris to be "disorderly," whereas Wolfenbüttel was an example of "good order".[48] It is possible that Haller attempted to implement in Bern one form or another of library technology that had inspired him during these visits.[49]

[48] Cited in Boschung 1995 (note 1), 159 and 161.

[49] A detailed study of the city library of Bern and its librarians in the sixteenth to eighteenth centuries is planned by the author for the near future. Only after this study is completed will it be possible to adequately compare the library of Bern with other contemporary libraries in terms of library science and practice.

CHANGE OF PARADIGM AS A SQUABBLE BETWEEN INSTITUTIONS: THE INSTITUTE OF HISTORICAL SCIENCES, THE SOCIETY OF SCIENCES, AND THE SEPARATION OF CULTURAL AND NATURAL SCIENCES IN GÖTTINGEN IN THE SECOND HALF OF THE EIGHTEENTH CENTURY

Martin Gierl

The story related here takes place against the background of a fundamental development in the history of science: the separation of the cultural from the natural sciences in the eighteenth century. The stage on which it played out is the leading university in the Holy Roman Empire, the University of Göttingen, with the Society of Sciences, designed by Albrecht von Haller, on one side, and the Institute of Historical Sciences, founded in 1764 by Johann Christoph Gatterer, who held the chair of history from 1759 until his death in 1799, on the other.[1] Two academies—Gatterer had originally intended to name his institute "Historical Academy"—confronted each other and engaged in a quarrel. I will demonstrate that Gatterer intended to practise history very much along the lines of the old concept ultimately originating in antiquity, including geography and chronology and incorporating the *historia naturalis*—in the manner of what we would call natural science today. I will also show that while he found favourable conditions for this in Göttingen with respect to geography, his project was at the same time curtailed at the institutional level by the resistance of the Society of Sciences. Focusing on the case of Göttingen, we can advance the following hypothesis: It was for *institutional* reasons that historiography in the second half of the eighteenth century became

[1] I wish to thank the Max-Planck-Institut für Wissenschaftsgeschichte and the Gerda-Henkel-Stiftung for their support of the research on which this article is based. The official names or self-designations were Royal Society of Sciences in Göttingen [Königliche Sozietät der Wissenschaften zu Göttingen] and Royal Institute of Historical Sciences [Königliches Institut der historischen Wissenschaften]. Gatterer and eighteenth-century historiography are treated in greater detail in Martin Gierl's forthcoming *Geschichte als präzisierte Wissenschaft. Johann Christoph Gatterer und die Geschichtsschreibung des 18. Jahrhunderts im ganzen Umfang* (working title); for an excellent introduction to Gatterer, see Peter Hanns Reill, 'Johann Christoph Gatterer', in Hans Ulrich Wehler (ed.), *Deutsche Historiker* (Göttingen 1980), vol. 6, 7–22.

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a narrative cultural science rather than a social science embedded in both the natural sciences and the specialised jurisprudential environment.

The protagonists and opponents in my story include Gatterer, on one side; on the side of the Society of Sciences, orientalist Johann David Michaelis along with mathematician Abraham Gotthelf Kästner; and, midway between these two parties, natural historian Christian Wilhelm Büttner.[2]

The separation of the cultural from the natural sciences cannot be narrated only as an institutional history. Alongside the latter there exists a whole range of discourse histories, all of them just as coherent in themselves: that of historiography, debates about cultural and linguistic development, and specialised mathematical and geographical discourse, and as many biographically coherent personal histories as there are actors in the process: that of Michaelis, who directed the Society of Sciences after Haller's departure, interpreted the Bible from a historical and empirical perspective, and organised Niebuhr's famous research expedition to the orient; that of Kästner, who was appointed director of the astronomical observatory in the 1760s and who fought to make mathematics an independent subject; as well as that of Büttner, who linked linguistic analysis with the reconstruction of the history of peoples. The discourse histories, life histories, and institutional histories of the separation of cultural and natural sciences are interlinked, but they do not simply blend into each other and are not simply each a reverse side of, or another perspective on, the other histories. Behind my narrative thus stands a question of general and, in my view, topical—in terms of theory—historiographical interest: How are the institutional, cultural, life, and discourse histories that we historians narrate, and which, as narratives, inevitably have an inner coherence, interconnected? How do the historical fields concerned with institutions, culture, life, and discourses—in terms of both real historical events and discourse history—translate from one into the other with respect to communication and interaction?

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[2] On Michaelis, see Michael C. Carhart, *The Science of Culture in Enlightenment Germany* (Cambridge 2007), 31ff. and 165ff.; see also Rainer Baasner, *Abraham Gotthelf Kästner, Aufklärer (1719–1800)* (Tübingen 1991). On Büttner, see Manfred Urban, 'Die Völkerkundliche Sammlung. Eine im Zeitalter der Aufklärung wurzelnde ethologische Sammlung ihre Entstehung und weitere Entwicklung', in Dietrich Hoffmann and Kathrin Maack-Rheinländer (eds.), *"Ganz für das Studium angelegt". Die Museen, Sammlungen und Gärten der Universität Göttingen* (Göttingen 2001), 91–98. On Büttner's biography, see 'Christian Wilhelm Büttner', in Friedrich Schlichtegroll, Nekrolog der Teutschen für das 19. Jahrhundert, vol. 1. (1802), in *Deutsches Biographisches Archiv* (München 2004). Microfiche I 163, 188–216.

The answer I can give in the present case is unsatisfactory, or even downright impertinent. Regarding the biographical and discourse histories, I must ask readers to study them elsewhere if they are interested.[3] I cannot, therefore, even attempt to outline how discourses, biographies and institutions developed in reciprocal dependency and embedded within their discursive, biographical, and institutional environments. I must begin several steps earlier, by showing that institutions generally function as a kind of "aligner" of discourses and biographies. My theory is that the individual discourses on history, mathematics, geography, etc. are surrounded by an *institutional architecture* that they share in a historically specific fashion, and that the shape of this institutional architecture determines the scope of any further specialised discourses. Opportunities for action and for asserting one's interests within an institution depend on how much space is taken up by external interests—by neighbours within the shared institutional architecture, so to speak. In the case under discussion here, the development of historiography did not depend directly on the mathematical, philological, and other discourses, but was very much indirectly dependent on how strongly they promoted themselves in institutional terms alongside history. In my view, these types of crucial, non-content-related institutionalising effects of discourses define a central and concrete aspect of their historical weight.

The following section outlines Gatterer's concept of historiography and his plan for an academy. This is followed by a presentation of the connection between historiography and geography, and of the favourable situation Gatterer faced at the outset with regard to geography in Göttingen. The final section contains a detailed account of this particular case.

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[3] On the history of historiography in the eighteenth century, see Horst Walter Blanke, *Historiographiegeschichte als Historik* (Stuttgart 1991); Daniel Fulda, *Wissenschaft aus Kunst. Die Entstehung der modernen deutschen Geschichtsschreibung 1760–1860* (Berlin 1996); Notker Hammerstein, *Jus und Historie. Ein Beitrag zur Geschichte des historischen Denkens an deutschen Universitäten im späten 17. und 18. Jahrhundert* (Göttingen 1972); Ulrich Muhlack, *Geschichtswissenschaft im Humanismus und in der Aufklärung. Die Vorgeschichte des Historismus* (München 1991); Peter Hanns Reill, *The German Enlightenment and the Rise of Historicism* (Berkeley 1975). On geography, see Anne Maria Claire Godlewska, *Geography Unbound. French Geographic Science from Cassini to Humboldt* (Chicago 1999); Robert J. Mayhew, *Enlightenment Geography. The Political Languages of British Geography. 1650–1850* (Basingstoke 2000). On Gatterer's attempts to link history and natural history, see Gierl, forthcoming (note 1); id., 'Das Alphabet der Natur und das Alphabet der Kultur im 18. Jahrhundert. Botanik, Diplomatik, Linguistik und Ethnographie nach Carl von Linné, Johann Christoph Gatterer und Christian Wilhelm Büttner', *Zeitschrift für Geschichte und Ethik der Naturwissenschaften, Technik und Medizin* 18 (2010), 1–27.

History in All Its Breadth

The guiding principle Gatterer followed as a historiographer was to process, write, and organise history in all its breadth [in ihrem ganzen Umfang]. The idea was that once all historically relevant, "noteworthy" [merkwürdige] events had been recorded and accurately arranged, it would be possible to chart history, locate each individual event in the overall chain of events, and, ultimately, even trace the causal sequence of historical developments. History could then be written "pragmatically", to use the term of the day. Gatterer had not only entitled the majority of his universal histories—he published no less than ten such compendiums—"Universal histor[ies] in all [their] breadth" [Universalhistorie(n) im ganzen Umfange], but had also emphasised foremost in the proposal for his Institute of Historical Sciences that in the institute he intended to produce history "in all its breadth" [im ganzen Umfange].[4]

In the way it was conceived as a discipline, from the seventeenth century onwards, history in all its breadth comprised ecclesiastical history, secular history, the history of scholarship, and natural history, at least in so far as nature as a resource base and source of livelihood set the conditions for settlement, the economy, the state, and "character formation" [Charakterbildung]. Conceptually, history in all its breadth was understood as connecting singular history with particular history, and particular history with universal history—for example, the history of an institution with the history of a town, this history of a town with that of a country, and, finally, the latter with universal history. Methodologically, this reconstruction of history was to be objectivised with the help of "auxiliary sciences". These were, on the one hand, expected to deliver the supporting work needed to produce the actual product, i.e. history; on the other hand, they were suited to do so precisely because they were sciences "in the proper sense", as Gatterer called them.[5] In the eighteenth century, this idea of systematising and scientifying knowledge with the help of auxiliary sciences was not limited to history. It was also applied to the "science of the state" [Staatswissenschaft], which gained authority by appropriating physics, chemistry, botany, agricultural science, and the science of administration

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[4] Johann Christoph Gatterer, 'Geseze des Königl. Instituts der historischen Wissenschaften', § 1, 23.12.1766, Göttingen University Archive, Kur 7540 Statuten, 1r.

[5] Johann Christoph Gatterer, *Einleitung in die synchronistische Universalhistorie zur Erläuterung seiner synchronistischen Tabellen* (Göttingen 1771), 2 vols., I: 2; as well as id., *Abriß der Universalhistorie in ihrem ganzen Umfange* (second edn., Göttingen 1773), 4.

as auxiliary sciences; and along the same lines, anatomy and chemistry were considered auxiliary sciences of medicine.[6] In the case of history, the auxiliary sciences included diplomatics, heraldry, genealogy, numismatics, statistics, geography, and chronology. Indeed, for each of these disciplines Gatterer published comprehensive compendiums or—in the cases of numismatics and statistics—at least outlines and concepts, and all of these publications enjoyed the status of standard textbooks into the nineteenth century.

Gatterer's institute was to have five classes: a general class for universal and national history, as well as a numismatic, a heraldic-genealogical, a diplomatic, and a chronological-geographical one. A numismatic cabinet, a cabinet of heraldries, a cabinet of historical documents, a natural history collection, and a map collection were to be at the core of the classes in the auxiliary sciences. These collections were to provide a basis for making "discoveries", and, above all, for training students in the technical aspects of working with the material under study in their respective areas of specialisation. Once they had been trained, students were to return to their home towns and establish branch institutes there, replicating the structure of the institute in Göttingen. Thus, Gatterer envisioned the emergence of an entire network of historical academies—"historical academy" [Historische Akademie] being Gatterer's original title for the institute, analogous to the concept of "history in all its breadth"—with the Göttingen institute as the centre of the network.[7] This was Gatterer's plan. Had

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[6] See, for example, Christoph Wilhelm Hufeland and Johann Friedrich August Göttling (eds.), *Aufklärungen der Arzneywissenschaft aus den neuesten Entdeckungen in der Physik, Chemie, und andern Hülfswissenschaften* (Weimar 1793); Johann Heinrich Voigt, *Magazin für den neuesten Zustand der Naturkunde mit Rücksicht auf die dazu gehörigen Hülfswissenschaften* (Weimar 1797–1806); regarding the sciences of the state, see Andre Wakefield, *The Disordered Police State. German Cameralism as Science and Practice* (Chicago 2009), 115 and 127. On auxiliary sciences in the context of historiography, see Frank Rexroth, 'Woher kommen die Historischen Hilfwissenschaften? Zwei Lesarten', in Sabine Arend et al. (eds.), *Vielfalt und Aktualität des Mittelalters. Festschrift für Wolfgang Petke zum 65. Geburtstag* (Bielefeld 2006), 541–557; Eckart Henning, 'Die Historischen Hilfswissenschaften—historisch gesehen', in Friedrich Beck and Eckart Henning (eds.), *Vom Nutz und Frommen der Historischen Hilfswissenschaften* (Neustadt a.d. Aisch 2000), 11–22.

[7] See Gatterer 1766 (note 4); on the Institute of Historical Sciences, see Göttingen University Archive, Kur 7539 and 7540; Hans Goetting, 'Geschichte des Diplomatischen Apparats der Universität Göttingen', *Archivalische Zeitschrift* 65 (1969), 11–46; Lothar Kolmer, 'G.H. Lichtenberg als Geschichtsschreiber. Pragmatische Geschichtsschreibung und ihre Kritik im 18. Jahrhundert', *Archiv für Kulturgeschichte* 65 (1983), 371–417; Karl Heinz Debus, *Der Gatterer-Apparat* (Speyer 1998), introduction; Horst Walter Blanke and Dirk Fleischer, 'Vorwort', in Horst Walter Blanke and Dirk Fleischer (eds.), *Theoretiker der deutschen Aufklärungshistorie* (Stuttgart 1990), 52.

he succeeded in implementing it, he would have made history the business of organised experts in a discipline clearly structured according to methods and objects of study. The classes and cabinets were intended to systematically and exhaustively collect and examine history and historical sources, to prepare them and to make them available for further use. There were plans to compile the "Germania sacra" and publish scholarly editions of the German chroniclers. The institution's two journals, which were published in 16 volumes each and offered reviews of historiography across Europe as well as discussions of disciplinary concepts—this part of the plan, at least, was implemented—count among the early modern disciplinary scientific journals.[8]

It is important to emphasise that Gatterer was not the only scholar to consider the catalogue of auxiliary sciences and sub-domains of history and the cooperation and interrelations among them to represent history in all its breadth. Indeed, this concept was a textbook standard and a disciplinary canon in the eighteenth century, both propagated by Protestant historians and taught by Catholic historians such as Anselm Desing. Even at the beginning of the nineteenth century it continued to define the basic structure of the discipline.[9]

Today, the "magistra vitae" and, with it, the link to the narrative and the example is usually seen as the one and only emblem of early modern historiography. At the time, however, historians believed that chronology and geography were the two eyes of history.[10] History was interlinked with astronomy and geodesy, but also with knowledge of nature: not only in terms of a *historia naturalis* as regional geography which, in addition to provinces and towns, described rivers, plants and animals of a given region, but also in terms of a social natural history based on the notion that mankind formed, and was formed by, the Earth and nature, as Gatterer put it.[11]

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[8] *Allgemeine historische Bibliothek* (Göttingen 1767–1771), 16 vols.; *Historisches Journal von Mitgliedern des Königlichen Historischen Instituts zu Göttingen* (Göttingen 1772–1781), 16 vols.

[9] See concepts reprinted in Blanke and Fleischer 1990 (note 7). Anselm Desing, *Auxilia historica* (Stadt am Hof 1747), 9 vols.

[10] See Mayhew 2000 (note 3), 33; on the use of this concept by theoreticians of the *ars historica*, see Anthony Grafton, *What Was History? The Art of History in Early Modern Europe* (Cambridge 2007), 92.

[11] See Johann Christoph Gatterer, *Abriß der Geographie* (Göttingen 1775), 140; on regional geography, see Godlewska 1999 (note 3); Mayhew 2000 (note 3); Mohammed Rassem and Justin Stagl, *Geschichte der Staatsbeschreibung. Ausgewählte Quellentexte* (Berlin 1994).

Gatterer implemented this claim to comprehensiveness in his work as a historian in Göttingen. Among other things, he systematically studied meteorology, hoping to better understand climate—which was considered a cultural factor of utmost importance and had traditionally been studied by geographers—and thereby gain new insights into settlement patterns.

Gatterer's intention was to determine geography synchronically and chronology diachronically, thereby making history three-dimensional, and then to locate "noteworthy" events—which were to be verified by means of source documents—in the historical matrix. Thus charted, history would be transformed into pragmatic historiography along the lines of Enlightenment rationalism. Verification of geography, chronology, and the matrix of events required cooperation, expertise, and mathematics. Accordingly, in Gatterer's plan for the institute, his requirements for members of the historical class included historical, rhetorical, and ethical knowledge, but also knowledge of international law, logic, and natural history. "Members of the chronological-historical class must have pursued, or still pursue, mathematical studies: but above all, they must diligently study astronomy, mathematical chronology, and geography. Members of the remaining classes shall devote themselves mainly to gaining thorough and broad insights into the sciences of their class."[12]

At the Centre of the World: The Geographical Tradition in Göttingen

One of the essential preconditions that allowed Gatterer to raise the issue of a kind of parallel academy for history in all its breadth in the form of his institute was the fact that he was able to integrate in it the processing of the synchronous dimension of his measured cube of history: what we would call social science today, and which in the eighteenth century, with different priorities, consisted of the social and geographical description of the world and culminated in geography, which also included statistics.[13] In order to institutionalise positivist history in all its breadth, Gatterer needed a unit of geography that was well developed and, at the same time, not independently institutionalised, thus allowing him to integrate it into his institute. Among the favourable conditions for Gatterer's

[12] Johann Christoph Gatterer, 'Entwurf einer Historischen Akademie', September 1764, Göttingen University Archive, Kur 7539, 26r–v.

[13] Godlewska 1999 (note 3); Mayhew 2000 (note 3), Rassem and Stagl 1994 (note 11).

institute is the fact that he was able to inherit the Göttingen geographical tradition after the end of the Seven Years' War—a tradition that in many ways was no less remarkable than the university's historical bustle at the end of the eighteenth century which led to the label of the "Göttingen school of history". Anton Friedrich Büsching (1724–1793), the leading historical geographer of his time, and Tobias Mayer (1723–1762), the leading mathematical cartographer, both held positions in Göttingen for several years; so did Georg Moritz Lowitz (1722–1774) and Johann Michael Franz (1700–1761).[14] Mayer, Franz and Lowitz all worked for Homann, the leading map publisher in Nuremberg, which was the centre of German map production at the time. Moreover, like Büsching, they had important functions in the Nuremberg Cosmographical Society, which had been founded by Franz in 1746, with ambitious goals. The idea was to persuade the Emperor to proclaim the society the Imperial German Academy of Geography [Kaiserlich Deutsche Reichsakademie für Erdbeschreibung]: it was to become a German Imperial office of measurement [Reichs-Messungs-Kontor]. The society also planned to produce a low-cost atlas of Germany, as well as globes that were more affordable and better than those crafted by Coronelli, the leading seventeenth-century globe-maker who had constructed a terrestrial and a celestial globe nearly four metres in diameter for Louis XIV, and in 1684 had founded the very first geographical society, the *Accademia cosmografica*.[15] Franz demanded that the planned atlas of the Empire consist exclusively of measured maps, that it be based on certainty, and that it be complete. By completeness he meant that the maps were to be complemented by historical and political descriptions and had to precisely record the earth, mountains, valleys, islands, forests, etc., and, concerning the historical aspects, "cottages, houses, castles, ruins, hamlets, spots, towns" etc.[16] Göttingen succeeded in attracting all four of these key

[14] See Arthur Kühn, *Die Neugestaltung der deutschen Geographie im 18. Jahrhundert. Ein Beitrag zur Geschichte an der Georgia Augusta zu Göttingen* (Leipzig 1939); Eric Gray Forbes, *Tobias Mayer (1723–62). Pionier der Naturwissenschaften der deutschen Aufklärungszeit* (Marbach 1993); Erwin Roth, 'Vermesser des Meeres, der Erde und des Himmels. Tobias Mayer—ein beinahe vergessenes Genie', *Beiträge zu Landeskunde* 5 (1985), 1–7; Steven Adriaan Wepster, *Between Theory and Observations. Tobias Mayer's Explorations of Lunar Motion 1751–1755* (Utrecht 2007); Peter Hoffmann, *Anton Friedrich Büsching (1724–1793). Ein Leben im Zeitalter der Aufklärung* (Berlin 2000); Regine Pfrepper, 'Georg Moritz Lowitz (1722–1774) und Johann Tobias Lowitz (1757–1804). Zwei Wissenschaftler zwischen Göttingen und St. Petersburg', in Elmar Mittler and Silke Glitsch (eds.), *Russland und die "Göttingische Seele". 300 Jahre St. Petersburg* (Göttingen 2003), 163–182.

[15] Forbes 1993 (note 14), 58–65; Kühn 1939 (note 14), 21–26.

[16] Franz cited in Kühn 1939 (note 14), 41.

persons from Nuremberg: Tobias Mayer, the mathematician, physicist and cartographer, who first held a chair of economics in Göttingen and then was charged with supervision of the Göttingen observatory, and who has remained famous for his chart of the full moon and his lunar tables, which earned him part of the prize announced by the British government for a solution to the problem of longitude determination; geographer Büsching; and Lowitz and Franz. With these individuals, Göttingen not only acquired the German geographical elite, including the Cosmographical Society, but also the "globe factory" project. The city reached out to incorporate geography, globes, and map production all at once. The Hanoverian government allotted 3,000 thalers for the globe factory, and there was an illustrious list of subscribers. Nonetheless, the enterprise ended in a fiasco, whether due to a lack of infrastructure, such as a sufficient number of precision mechanics and graphic designers, or to the war. Franz and Mayer died during the Seven Years' War, and the wooden globe parts that Lowitz had fabricated were burnt in the stoves of the French occupiers' cooks.[17] Lowitz left town in 1768; Büsching had departed already in 1761. This geographical gap was filled by three of the seven founding members of Gatterer's institute: Johann Tobias Köhler, who lectured in geography "according to his late father's compendium" as of 1762; Isaac Colom du Clos, who taught "geography of Germany" and "introduction to the use of globes" as of the same year; as well as Gatterer himself, who lectured in geography in 1764 and 1765 with stupendous success.[18]

The Society of Sciences and the Institute of Historical Sciences

In many ways, Gatterer's idea of founding a "historical academy" depended on the existing academic institutional setting: on the fact, for example, that several models of learned societies already existed at the university; that the trend in these societies was towards combining research with teaching; that Göttingen was very open to positive external influences; and that historiographical media were generally experiencing a boom at that time.[19]

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[17] Ibid., 30–35; Forbes 1993 (note 14), 69f. and 75–79.

[18] Kühn 1939 (note 14), 110–112.

[19] On the Göttingen University in the second half of the eighteenth century, see Ulrich Hunger, 'Die Georgia Augusta als hannoversche Landesuniversität. Von ihrer Gründung bis zum Ende des Königreichs', in Ernst Böhme and Rudolf Vierhaus (eds.), *Göttingen. Geschichte einer Universitätsstadt*, vol. 2: *Vom Dreißigjährigen Krieg bis zum Anschluss an Preußen—Der Wiederaufstieg als Universitätsstadt (1648–1866)* (Göttingen 2002), 139–213;

In addition to these general conditions, there were also several specific conditions that simultaneously made possible and also limited Gatterer's institute in Göttingen in its concrete form. The most important of these specific conditions was the existence of a weak academy of sciences that competed aggressively with the institute precisely due to its weakness, and in response to a threat that was not only imaginary: the Society of Sciences.[20]

As a principle for organising nature, culture, and the world at large, classification is a well-suited means to describe institutions—particularly institutions muddling along like the Göttingen academy at the time. In any case, this was the opinion of Abraham Gotthelf Kästner, a founding member of the society, who has remained famous more as a caustic writer than as a mathematician. He packed all his mockery, and probably also his worries about the state of the academy, into his "Plate illustrating the Royal Society of Sciences in Göttingen in the year 1760", in which each member was assigned his own category: the class of full members [ordentliche Mitglieder] was divided into "Directorabiles" (Samuel Christian Hollmann and Johann Matthias Gesner) and "Indirectorabiles" (Kästner, Michaelis, Mayer). The class of associate members [ausserordentliche Mitglieder] was divided into those who do not attend and do not work (geographer Franz, who had been summoned from Nuremberg), those who attend and do not work (Gottfried Achenwall), and those who attend and do work (medical scientist Johann Georg Röderer and geographer Lowitz); the latter category was yet again subdivided into the groups "persuading to resign from the society" (Röderer) and "persuaded to resign from the society" (Lowitz).[21]

Indeed, the academy's situation in 1760 was difficult. Albrecht von Haller, the internationally prominent anatomist, botanist, president and designer of the academy of sciences, had left Göttingen in 1753, but had nevertheless remained president and editor-in-chief of the *Göttingische*

William Clark, *Academic Charisma and the Origins of the Research University* (Chicaco 2006), 141–183; Dieter Cherubim and Ariane Walsdorf, *Sprachkritik als Aufklärung. Die Deutsche Gesellschaft in Göttingen im 18. Jahrhundert* (Göttingen 2004).

[20] See Johannes Joachim, *Die Anfänge der Königlichen Sozietät der Wissenschaften zu Göttingen* (Berlin 1936); Ferdinand Frensdorff, 'Eine Krisis in der Königlichen Gesellschaft der Wissenschaften zu Göttingen', *Nachrichten von der Königl. Gesellschaft der Wissenschaften und der Georg-Augusts-Universität zu Göttingen* 3 (1892), 53–104; Richard Toellner, 'Entstehung und Programm der Göttinger Gelehrten Gesellschaft unter besonderer Berücksichtigung des Hallerschen Wissenschaftsbegriffs', in Fritz Hartmann and Rudolf Vierhaus (eds.), *Der Akademiegedanke im 17. und 18. Jahrhundert* (Bremen 1977), 97–115.

[21] Frensdorff 1892 (note 20), 67.

Members of the Göttingen Society of Sciences: development to 1766

First + middle name	Surname	Class	Subject area	Year	Change in status
Johann Matthias	Gesner	H	Philology	1761	Died
Johann Andreas von	Segner	M	Physics, mathematics	1755	Went to Halle
Tobias	Mayer	M	Mathematics	1762	Died
Abraham Gotthelf	*Kästner*	*M*	*Mathematics, physics*	1751	Founding member
Johann Georg	Röderer	P	Medicine	1763	Died
Johann Philipp	***Murray***	***H***	***History***	1762	Secretary
Christian Wilhelm	*Büttner*	*P*	*Natural history*	1751, 1762, 1770	RA, AM, FM
Samuel Christian	Hollmann	P	Physics	1761	Resigned
Johann David	***Michaelis***	***H***	***Philology***	1751	Founding member
Gottfried	Achenwall	H	Statistics	1762	Resigned
Johann Gottfried	Zinn	P	Medicine	1759	Died
Johann Michael	Franz	H	Geography	1761	Died
Georg Moritz	Lowitz	P	Physics, mathematics	1759	Resigned
Johann Heinrich Gottlob von	Justi	P	Cameralist	1757	Went to Copenhagen
Albrecht Friedrich Ludwig	*Meister*	*M*	*Mathematics*	1757, 1764	RA, AM
Christian Gottlob	***Heyne***	***H***	***Philology***	1763	Joined
Christian Wilhelm Franz	***Walch***	***H***	***Ecclesiastical history***	1763	Joined

RA = Regular auditor; AM = associate member; FM = full member; italic script denotes members in 1766; italic small caps: Büttner; italic and bold: salaried members. Based on data from Krahnke 2001 (note 41).

Gelehrte Anzeigen, the leading German learned journal in the eighteenth century that was published by the society.[22] Münchhausen, the powerful Hanoverian minister and university director, continued to await Haller's return until he died in 1770. The society's development was blocked.

In 1761, the situation of the Society of Sciences further deteriorated. In the course of changing occupations during the Seven Years' War, the idea of moving the university away from Göttingen was proposed. Gesner, the leading figure in Göttingen, head of the library and the academy and founder of the famous philological seminar [Philologisches Seminar] had died; so had geographer Franz. Internal quarrels persisted. Philosopher Hollmann, the third-last representative of the physical class, resigned from the society.[23]

But the worst was still to come. In 1762, statistician Achenwall, who had only been an associate member, left the society; Tobias Mayer died. Röderer, the second-last member of the physical class, died in 1763. The only one left now was Christian Wilhelm Büttner. Already in October of

[22] See Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller: Leben—Werk—Epoche* (Göttingen 2008).

[23] Frensdorff 1892 (note 20).

1761, orientalist Michaelis, director of the academy, had sent university curator Münchhausen an urgent memorandum, requesting the election of new members. The academy, he wrote, needed a new *historici* in the historical class; in principle this role should have been assumed by Gatterer, who was, however, publishing self-reviews lauding his own work in a "shameless manner". Above all, however, there was an urgent need for a proper natural scientist in the physical class—a man like Christian Wilhelm Büttner, who had retained the status of a mere regular auditor since 1751. "Such a man would be of great use to us in the society, when we talk about learned things at the reunions, after the lectures. He would give us all a cause for making discoveries, and save us all from taking the wrong steps".[24] Michaelis' plan was clever: he wanted to rent a room for the academy located between the library and Büttner's natural history collection, and thereby annex the latter to the academy without incurring extra expenses. Moreover, he claimed that Büttner's knowledge of the Orient was indispensable to him. Since 1753, Michaelis had been organising Carsten Niebuhr's equally famed and catastrophic expedition to the Orient, which had set out in 1761, and, indeed, Büttner had belonged to the "society of learned friends" that Michaelis had founded in order to elaborate a catalogue of scientific research questions for Niebuhr.[25] Büttner thus represented more than just natural history: he was the physical class of the Society of Sciences in 1763. Nevertheless, it was not the physical, but the historical wing that underwent reorganisation, newly joined by the ecclesiastical historian Walch and the philologist Christian Gottlob Heyne—the rising star at the university and the academy, who was entrusted with the leadership of the society, of the *Göttingische Gelehrte Anzeigen*, and of the library.[26]

Christian Wilhelm Büttner had become Göttingen's first professor of natural history in 1758.[27] He had undertaken extensive study travels in his younger years, and was said to have shared lodgings with Linné in Leiden in 1737. Moreover, he owned one of the largest private natural history

[24] Johann David Michaelis, memoir, 11.10.1761, Archive of the Göttingen Academy of Sciences, Pers 17/10, 2.

[25] See Friedhelm Hartwig, 'Carsten Niebuhrs Darstellung von Jemen in seiner "Beschreibung von Arabien" (1772) und dem ersten Band seiner "Reisebeschreibung nach Arabien" (1774)', in Josef Wiesehöfer and Stephan Conermann (eds.), *Carsten Niebuhr (1733–1815) und seine Zeit* (Stuttgart 2003), 155–202: 157 (note 9).

[26] Frensdorff 1892 (note 20), 66–68.

[27] On Büttner, see note 2.

collections in the whole of Germany.[28] Büttner was a collector and was obsessed with knowledge. If anyone in Göttingen embodied the image of the eccentric savant oblivious to society—an image that was dated even in the Age of Enlightenment—it was he.

> His living room, in itself very spacious, would, however, gradually become crowded by the burden of books and curiosities piling up in it, and in part even by the natural consequences of the uncleanliness of his animal roommates, so that from time to time he would have to exchange it for another. For many years he lived with monkeys and dogs, which he loved particularly tenderly . . ., at times also with hedgehogs, eagles, seagulls, and the like . . . no man who entered his dwellings [could] grasp how he managed to endure in this atmosphere; he smoked tobacco of poor quality all day, and, in addition, kept a constantly burning oil lamp at his side.[29]

Büttner was known to be a loner, but this did not mean that he was isolated. One could argue whether it was only a coincidence that Büttner lived in the respectable house directly adjoining the library, which previously, in the age of the reform of theology throughout German universities, had been the home of university chancellor and religious historian Mosheim, and after Büttner, during the boom years of the Göttingen university, was inhabited by three English princes who studied under Lichtenberg, the advocate of magnetism and electricity who represented modern physics at the end of the eighteenth century. Around 1760, Büttner was, indeed, the incarnation of modern natural science in line with the cultural trend, and the reason for this was more than the fact that he was the only member of the physical class of the Göttingen academy for a short period. Büttner brought together linguistics and ethnology. His research constituted a kind of hinge between culture and nature. Büttner attempted to reconstruct the development of all alphabets and, based on his insights, reconstruct a universal alphabet that was to contain all the pronunciations for all languages.[30] On the one hand, he thereby expected to create a universal linguistic instrument that could serve to translate the Bible and scientific knowledge into the languages of illiterate peoples and would make it possible to record their cultures in writing. On the other hand, Büttner believed that reconstructing the alphabets would

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[28] See Christine Nawa, *Sammeln für die Wissenschaft. Das Academische Museum Göttingen (1773–1849)*, master's thesis in history, University of Göttingen, 2005.

[29] Schlichtegroll 1802 (note 2), 204.

[30] See Christian Wilhelm Büttner, *Vergleichungs-Tafeln der Schriftarten verschiedener vergangener und gegenwärtiger Zeiten* (Göttingen 1771 and 1779), 2 issues.

enable him to understand the evolution of language, and, on this basis, trace the development and branching out of peoples. With the analysis of alphabets and the derived universal alphabets, Büttner attempted to create an ethnographical general instrument to classify peoples as well as their history.

Büttner was widely acknowledged as a first-rate language expert. He became a teacher and an authority in linguistic and ethnohistorical questions well beyond those related to Michaelis' research on Palestine. Grellmann, whose cliché-laden book on gypsies turned out to have a disastrous long-term impact, had adopted the idea that the Roma originated in India from Büttner.[31] Moreover, Büttner was the teacher and friend of anthropologist Blumenbach. Last, but not least, however, Büttner collaborated with Gatterer. Building on the work of French predecessors, Gatterer had begun to link diplomatics with botany. With his *Linnaeismus graphicus* he intended to classify all writing systems and their shape variants according to their "natural", i.e. empirical incidence, both in geographical terms and in terms of their historical development. The goal was thus to devise a kind of world map of writing systems, which, as a documentation of the development of writing systems, at the same time also depicted cultural development.[32] Like Büttner with his general alphabet, Gatterer with his *Linnaeismus graphicus* also had in mind its practical use: classification of all writing systems would make it possible to locate written sources both culturally and temporally. Gatterer built on Büttner's expertise with regard to writing systems. This was more than an isolated short-term collaboration: Büttner's signature comes second after Gatterer's on the ceremoniously sealed signature list of the founding members of the Institute of Historical Sciences. Gatterer, like Büttner, strove to bring together culture and nature. Büttner, as a natural historian and linguist, researched the chain of nature, regional conditions, ethnic evolution, language, and culture. Gatterer wanted to base his universal history on the physical-geographical conditions of state development. Accordingly, Gatterer's

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[31] See Heinrich Moriz Gottlieb Grellmann, *Historischer Versuch über die Zigeuner betreffend die Lebensart und Verfassung, Sitten und Schicksale dieses Volks seit seiner Erscheinung in Europa und dessen Ursprung* (second edn., Göttingen 1787), XIVff. and 284. See Claudia Breger, 'Heinrich Moritz Gottlieb Grellmann. Überlegungen zu Entstehung und Funktion rassistischer Deutungsmuster im Diskurs der Aufklärung', in Barbara Danckwortt (ed.), *Historische Rassismusforschung. Ideologien—Täter—Opfer* (Berlin 1995), 34–69.

[32] See Gierl 2010 (note 3); Volker Rödel, 'Johann Christoph Gatterers "Linnaeismus graphicus". Klassifikation und Universalismus im 18. Jahrhundert', *Medizinhistorisches Journal* 17 (1982), 215–238.

historical academy, as a centre of collection of historical sources, universal history, and historical geography, was a reservoir of cultural knowledge for Büttner's culture-oriented natural history. Büttner with his natural history collection, in turn, was the living and material precondition enabling Gatterer to pursue his plans for a universal history based on natural history with his institute in Göttingen.

What a situation for the Göttingen Society of Sciences! Observatory, anatomical theatre, botanical garden, and natural history collection: the Göttingen university had all knowledge pools of natural-scientific research available at the time, but none of them was directly associated with the society.[33] And what was worse, with Büttner, natural history and its collection now seemed to be defecting to the side of the Institute of Historical Sciences. The Society of Sciences, according to Haller's concept and the original statutes, had been founded as an "academy of discovery" alongside the "academy of training", i.e. the university. Thus, here, too, the issue at stake had been science, its definition, and its institutionalisation in "all its breadth".[34] The intention had been to complete the overall scientific infrastructure in Göttingen. The society's task was to comprehensively further scientific innovation and research. This had been extended to the fields of mathematics, physics, and history, excluding the disciplines of theology and jurisprudence. History (including language), nature, and mathematics, represented by three respective classes, were the areas of knowledge considered capable and promising of innovation, and certainly the areas where innovation was desirable. The academy's history did not exclude representation of cultural-political identity. The admission of theologians focusing on ecclesiastical history, like Walch, or philologists engaged in theology, like Michaelis, as well as jurists specialising in legal or constitutional history, particularly to leading positions, was to remain a long tradition and a distinctive feature of the academy of sciences in Göttingen, as well as elsewhere—one other example is the academy in Berlin, with Harnack. Having come out of the Seven Years' war more dead than alive, the Society of Sciences, based on its members' traditionalist attitudes with regard to ideology and identity, gravitated more towards its cultural-political than its natural-scientific pole. Prior to Gatterer's plan of a "historical academy", in 1763, the Society of Sciences itself was, in its essence, a cultural academy.

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[33] See Hunger 2002 (note 19).
[34] See Joachim 1936 (note 20); Toellner 1977 (note 20).

As mentioned above, Gatterer had been attacked by Michaelis in 1761. Büttner as an associate member had not received the 60-thaler pension he was entitled to as the representative of the physical class; instead, it had been given to the ecclesiastical historian Walch and the philologist Heyne.[35] At this point in the story, Gatterer entered the scene with his idea of a "historical academy" that institutionalised history in all its breadth, comprising natural history and Büttner, along with other natural historians.[36] At least at the level of ideas and intentions, the two opposing societies were, on the one hand, a historical society that was discovery-oriented and thus operated not only narratively, but also empirically and analytically, and, on the other hand, an equally discovery-oriented scientific society that operated empirically and analytically as well. Both were interested in historical and cultural research, and both laid claim to covering their field in all its breadth: in the case of the Society of Sciences, this comprised nature and methodologically-based cultural science, including history, whereas in the case of Gatterer's "historical academy" it embraced history, including natural history, which was relevant in terms of cultural history. On this basis, Gatterer's institute had to be considered a serious challenge to the Göttingen academy—at least that is how Michaelis and Kästner saw it.

In 1764, when Gatterer's plan became known to the public, the Society of Sciences launched a long-term defensive campaign that helped substantially to create unity among the academy members, thereby securing the survival of the Society of Sciences in Göttingen.[37] The academy fought on all four sides from which scientific practice is fuelled with resources: funding, reputation, institutional control, and scientific capacity. Any plans regarding a government fund for Gatterer's historical academy were fiercely opposed: there was not enough funding for the society itself. Plans for Gatterer's institute to be exempt from postal fees were vehemently resisted, as well. This resistance was successful, curtailing from the outset Gatterer's plan to establish not only a historical academy, but an entire network of historical academies, and, above all, the idea to run the historical academy as a communication network. With equal force

[35] Frensdorff 1892 (note 20), 66–68.

[36] It also involved Georg Christoph Lichtenberg and his brother Ludwig Christian Lichtenberg, as well as Johann Christian Polycarp Erxleben, Christian Meuschen, and Jakob Christian Schäffer. Moreover, medical scientist Georg Matthiä was among the founding members along with Büttner.

[37] See Göttingen University Archive, Kur 7539 and 7540; Archive of the Göttingen Academy of Sciences, Scient 249.

and success the Society of Sciences also opposed the designation of the new institution as an "academy", as Gatterer had envisioned it. Resolutely, but without success, the society objected to the adjective "Royal" in the institute's designation; they wanted Gatterer's enterprise to remain a private undertaking.[38] Along the same lines, the official inauguration of the institute was thwarted for years, and even after the inauguration any independence for the institute was opposed. The society argued vehemently for Gatterer's institute being placed under the authority of the university. From the scientific point of view this was justified by one main argument: that Gatterer's institute was exceeding any acceptable limits of authority by far, as it intended to engage in natural history and annex mathematics. Let us join the decisive meeting of the senate in the year of 1767, where Gatterer's academy was negotiated as a university concern. At this meeting, the arguments were put forth in summarised form and in a strategically clever manner:

The first to speak was Walch, a full member of the society, who chaired the meeting in his function as the university pro-rector. He pointed out that the planned confirmation of the institute's president by the royal government ignored the university's authority; the confirmation should be issued by the university senate.

The next to speak was Kästner, who considered Walch's concern to be highly justified.

> Moreover, statistics, natural history, mathematical geography, and chronology do not belong in a historical institute, or one might just as easily take jurisprudence and theology instead. The learned sciences are all interlinked in a way that one can serve the other, but it is an obloquy that the historian inflicts upon the rest when he wants to take them over as mere maid-servants for his own people. It was also the attitude of the Royal Government that these matters of the Royal Society of Sciences, with which [the institute] shall by no means be placed on one level but on which it inflicts an insulting encroachment, shall be kept away from the institute.

Now Murray, the secretary, spoke up: Since the government had declared that the Historical Institute was not to compete with the society, "indeed, the paragraphs on natural history would have to be omitted. But it is a fact that [the institute] has its collection in this discipline, as well. And where shall that go to?" Perhaps the Society of Sciences, one is prompted to think, even when reading the minutes nearly 250 years later.

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[38] See the titles of the institution's journals in note 8.

The final word was spoken by Michaelis, the Director of the society, in the manner of a grand seigneur: Given that Court Councillor [Hofr.] Kästner and Prof. Murray had already pointed out that certain paragraphs "were detrimental to the rights of the Royal Society" and

> His Excellence, the Prime-Minister had declared to the society that the institute was to limit itself to history proper, and not draw natural history into its sphere, my duty demands that I request Your Magnificence [the Rector], not to issue the confirmation as long as the Society of Sciences has not deliberated on whether to make an appeal to the higher authorities, and, if its decision is affirmative, as long as it has not had time to do so.[39]

In brief: Only an academy was eligible to function as a scientific umbrella society; a historical institute was not. Only the academy was to be scientifically and financially independent; not the institute. Only the academy was to be a research academy, whereas the institute was to remain within the university framework and thus, rhetorically and narratively limited to the subject "proper", focus on teaching. This appears to have been a common opinion at the time. And not without reason: in 1760, the establishment of independent scientific disciplines with fixed boundaries had only just begun.[40] All the more importance was attached to the emerging boundaries. How, if not on this basis, would it have been possible to speak of improper imposition of subservience with respect to a demand for scientific supporting work and cooperation without exposing oneself to ridicule? Ultimately, Gatterer was interested in mathematics and natural history providing support in historical questions, and not in incorporation of these disciplines. Nevertheless, even in retrospect, the academy's reaction appears to be more than just a hysterical reflex in response to its own situation: after all, a discipline's methodologies and potential for development are defined by those who are in a position to determine its catalogue of research questions.

How did the quarrel end? The Royal Institute of Historical Sciences became a "common" institute of history of the sort we know today, with a collection of sources and scholarly editions, a fairly modern historical journal, and a jour-fixe for lectures. Büttner moved to Jena and sold his collection to the university in 1773.[41] His disciple and Heyne's co-brother-in-law,

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[39] The quotations are taken from: 'Diskussion vor dem Senat', 15.4.1767, Göttingen University Archive, Kur 7539, 5.

[40] See Rudolf Stichweh, *Zur Entstehung der modernen Systems wissenschaftlicher Disziplinen. Physik in Deutschland* (Frankfurt/M. 1984).

[41] On Büttner's collection, see Nawa 2005 (note 28), 43–60.

Blumenbach, systematised it and became its custodian. Heyne took over the leadership of the academy in 1770. In the same year, Büttner became a full member. In 1776, Gatterer became a member; his son Christoph Wilhelm Jakob followed in 1782. Once a member, Gatterer continually presented and published research results in the academy until his death. The *Historisches Journal*, which Gatterer published as of 1772 as a successor publication to the institute's previous journal, the *Allgemeine historische Bibliothek*, deteriorated and finally ended up as a bibliography.

The academy won. It owed this victory, among other things, to the fact that its opponent was by no means a united "historians' camp". On the contrary: August Ludwig Schlözer, an early full member with Gatterer, who later turned increasingly into Gatterer's competitor, became a member of the academy as Michaelis' protégé in 1766; the popular philosopher Christoph Meiners, who had published a cultural-anthropological *History of Mankind* in 1775, was a member of both societies as well; Spittler and Heeren—two other leading thinkers of the so-called "Göttingen school of history", which, with respect to ancient history, encompassed Heyne and Michaelis with their works on antiquity—where members of the academy.[42] How was it possible to unify a historical field that had already begun to diversify massively, giving rise to diverse object and career interests, as well as alliances and competition, in the academic sphere of Göttingen—and not only there? The term "Göttingen school of history" refers not to student-teacher relations nor to a shared methodology, but precisely to this field of competition in historical, cultural and anthropological interpretation, which emerged in Göttingen in the second half of the eighteenth century as an institutional effect of the Göttingen university, and which is captivating not for its shared attitude, but for its vigorous activity emanating from all of the university's areas of expertise in all areas of contemporary cultural-historical debate—which, as a political and cultural identity debate, was at the centre of discourse in the late Enlightenment.[43] The university and its members had to preserve, or at least try to preserve, their interpretational sovereignty.

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[42] See Holger Krahnke, *Die Mitglieder der Akademie der Wissenschaften zu Göttingen 1751–2001* (Göttingen 2001).

[43] See Carhart 2007 (note 2), 4ff.; Luigi Marino, *Praeceptores Germaniae. Göttingen 1770–1820* (Göttingen 1995); Reill 1975 (note 3); Georg G. Iggers, 'The University of Göttingen 1760–1800 and the Transformation of Historical Scholarship', *Storia della storiographia* 2 (1989), 11–37.

If Büttner as a person and scientific persona embodied an ensemble of scientific objects, methods, and procedures that was in step with the times, so did Gatterer and Schlözer. Gatterer, who specialised in ancient and medieval history, was primarily interested in making history more precise by pinning down events more precisely; Schlözer, whose main focus was on the science of the state, and who was referred to by some as "Imperial Publicity Councillor" [Reichs-Publicitäts-Rath], had a strong interest in the journalistic political effectiveness of historiography.[44] "Pragmatism", which had taken up the cause of identifying historical causal relations under consideration of the related natural conditions—the intention being to reconstruct structural patterns—now belonged to the past. The age of narration was dawning, and, with it, the age of historiographical introspection, during which the national state and intellectual history were established as the universal framework of history. Gatterer's scientific paradigm failed, but his Royal Institute of Historical Sciences became a "common", and thus in our eyes modern, scientific institute. Precisely for this reason it can rightly claim the position of a milestone on the road to a new modern historiography.

If one was to indicate a fixed point in time for the emergence of modern historiography, Anthony Grafton wrote in *What was History?*, it would be the foundation of the Institute of Historical Sciences. For Grafton, Gatterer's institute was an incarnation of the Göttingen school of history and the starting signal for the emergence of historism and the German research university. According to him, it transformed history from a subject into an object of research, as Gatterer presented his students with a comprehensive view of past societies: "the spirits of peoples (*ingenia populorum*), their customs, their rites, their institutions, laws, arts, crafts, and all the products of the human intellect", as Grafton quoted from the speech given by Christian Gottlob Heyne at the inauguration of the Institute of Historical Sciences in 1766.[45]

Indeed, Gatterer's Institute of Historical Sciences appears to link systematic research, training of historians, recording of sources and institutionalisation of the discipline, from source collections to modern disciplinary

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[44] Martin Peters, *Altes Reich und Europa. Der Historiker, Statistiker und Publizist August Ludwig von Schlözer (1735–1809)* (Münster 2003), 29.

[45] Grafton 2007 (note 10), 190; for the original quote from Christian Gottlob Heyne, 'Iussu et auspiciis Regis Augustiss. Potentiss. Clementiss. Rectoris Academiae nostrae Magnificentissimi Georgii III. Academiae Georgiae Augustae Prorector Abr. Gotth. Kaestner cum Senatu Institutum Historicum in A.D. XXIII. Decembr. 1766 inaugurandum indicit', in id., *Opuscula academica* (Göttingen 1785), vol. 1, 280–289: 287.

media, and thus to be an institutional signpost in the development of modern historiography. Heyne's list of characteristics of modern historiography, however—the *ingenia popularum*, customs, rites, institutions, laws, arts, crafts, products, and ideas—is not what Gatterer mainly had in mind with historiography. It is what Heyne considered to be modern historiography worthy of the Institute of Historical Sciences—Heyne, the future director of the Society of Sciences, who also did historical work as a scholar of antiquity and editor of the German version of Guthrie and Gray's compilation of world history.[46] The "noteworthy" events and the spirits of peoples, the customs, institutions, laws, arts, and ideas—in one word, culture—was the newly created profile of history, which was not only in line with the trends of the time, but also secured legitimate institutional boundaries. Nature was no longer a topic.

[46] *Allgemeine Weltgeschichte von der Schöpfung an bis auf gegenwärtige Zeit . . . ausgefertigt von Wilhelm Guthrie, John Gray, und andern in diesen Theilen der Wissenschaften berühmten Gelehrten bei Weidmann in Leipzig und trugen den bezeichnenden Untertitel Aus den Originalschriftstellern berichtigt, und mit einer fortlaufenden Zeitrechnung und verschiednen Anmerkungen versehen von Christian Gottlob Heyne* (Leipzig 1765), vol. 1; on this project and Heyne's participation in it, see Marianne Heidenreich, *Christian Gottlob Heyne und die alte Geschichte* (München 2006), 149ff.

WILHELM ERNST TENTZEL AS A PRECURSOR OF LEARNED JOURNALISM IN GERMANY: *MONATLICHE UNTERREDUNGEN* AND *CURIEUSE BIBLIOTHEC*

Thomas Habel

Early Learned Journals: The Take-Off Phase in German-Speaking Europe

When the first issue of W.E. Tentzel's *Monatliche Unterredungen* appeared on the literary market in 1689, learned journals had already been in existence for more than two decades.[1] Periodical journals appeared almost simultaneously as a new medium in France (*Journal des Sçavans*, 1665ff.), England (*Philosophical Transactions*, 1665ff.) and Italy (*Giornale de' Letterati* [Roma], 1668ff.), seeking to adapt to the ever accelerating process of knowledge at the time.[2] The first exponents of learned journals met this objective by reporting on new releases in the book market as well as on noteworthy developments in the world of scholarship. By doing so, they succeeded in combining the traditional components of the scholarly exchange of information—scientific publications, disputations, and scholarly correspondence on the one hand, and bibliographies and term catalogues on the other hand—in a medium that was both periodical and continual. For the first time, this offered members of the Republic of Letters an opportunity to obtain from one source, as it were, timely

[1] Very useful contemporary information about early scholarly publications can be found in Christian Juncker, *Schediasma Historicum* . . . (Leipzig 1692); [Markus Paulus Huhold], *Curieuse Nachricht Von denen . . . Juornal-* [sic], *Quartal- und Annual-Schrifften* . . . (first edn. Leipzig 1715, third edn. Freyburg [d.i. Jena] 1716); [Heinrich Ludwig Goetten], *Gründliche Nachricht Von den Frantzöische* [sic], *Lateinischen und Deutschen Journalen, Ephemeridibus . . .—Continuation . . .—Die andere Continuation* (Leipzig 1718, 1720 and 1724). For additional catalogues of eighteenth-century books and classification of learned publications, see Thomas Habel, *Gelehrte Journale und Zeitungen der Aufklärung* (Bremen 2007), 80–87.

[2] See Otto Dann, 'Vom *Journal des Sçavans* zur wissenschaftlichen Zeitschrift', in Bernhard Fabian and Paul Raabe (eds.), *Gelehrte Bücher vom Humanismus bis zur Gegenwart* (Wiesbaden 1983), 63–80; Martin Gierl, 'Korrespondenzen, Disputationen, Zeitschriften. Wissensorganisation und die Entwicklung der gelehrten Medienrepublik zwischen 1670 und 1730', in Richard van Dülmen and Sina Rauschenbach (eds.), *Macht des Wissens. Die Entstehung der modernen Wissensgesellschaft* (Köln et al. 2004), 417–438; Habel 2007 (note 1), 46ff.

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and comprehensive information about virtually all recent news in the scholarly world.

As early as 1667, only two years after the emergence of this new medium, the first response on the German market appeared when the jurist Friedrich Nitzsch from Giessen published a Latin translation of the French *Journal des Sçavans* under the telling title *Le Journal des Sçavans, hoc est Ephemerides Eruditorum* (Leipzig: Schürer and Fritzsch). Nitzsch employed the same argument that Denys de Sallo had formulated programmatically in introducing his *Journal des Sçavans*: with the help of this new organ, the reader could get a comprehensive view of important new publications without having to purchase them in advance, and could even obtain a general knowledge of literature without having to buy a single book.[3] The initial success of Nitzsch's project, which was published for no less than five full years, illustrated that this concept also found a response among the German scholarly public, based on the Republic of Letter's great need for knowledge about new trends and ideas.

The first serious attempt to establish an independent journal in Germany took place in 1668, when Gottfried Wilhelm Leibniz devised plans for a *Nucleus librarius semestralis*, a semi-annual publication of scholarly reports on the model of the *Journal des Sçavans*. But despite strenuous preparations, this project was never realised, as Leibniz was unable to procure either the hoped-for Imperial Privilege or financial support.[4]

The *Miscellanea curiosa medico-physica* (Leipzig: Trescher; appearing later in different places and under different publishers), which first appeared in 1670—with express reference to the *Journal des Sçavans* and the *Philosophical Transactions*—was the first original German scholarly journal.[5] As in the case of Nitzsch's translated journal, the language of publication was the international Latin of scholars.[6] In the form first of

[3] Original: 'L'Imprimeur au Lecteur', *Journal des Sçavans*, January 1665, fol. A3v–A4r; translated by Nitzsch: 'Interpres Lectori Benevolo S!', 1 (1667), fol. a4v–a5r.

[4] For details, see Hans Widmann, 'Leibniz und sein Plan zu einem *Nucleus librarius*', *Archiv für Geschichte des Buchwesens* 4 (1963), 621–636; Habel 2007 (note 1), 54f.

[5] The first version of the continually changing descriptive title was *Miscellanea curiosa medico-physica Academiae Naturae Curiosorum sive Ephemeridum medico-physicarum Germanicarum Curiosarum*. The journal published by the Academia Naturae Curiosorum, later known as the Leopoldina, appeared irregularly.

[6] A German translation, limited to articles concerned with medicine (20 volumes), was issued a century later: *Der Römisch-Kaiserlichen Akademie der Naturforscher auserlesene medizinisch-chirurgisch-anatomisch-chymisch- und botanische Abhandlungen* (Nürnberg: Endter & Engelbrecht, 1755–1771).

"observations" [*observationes*] and "annotations" [*scholia*], and later also of treatises as well as announcements of publications by its circle of members, the oldest German academy of natural history published news and findings from the medical and natural sciences in annual volumes. The journal was produced with the help of a large team of contributors, originally under the aegis of its president and later under a specially appointed *Director Ephemeridum*.

Of greatest significance for the expansion of scholarly publications in Germany was the *Acta Eruditorum* (Leipzig: Grosse and Gleditsch), which appeared in Latin beginning in 1682.[7] The *Acta* was published monthly by Otto Mencke, professor of moral and practical philosophy, together with the *Societas ad Colligenda Acta Eruditorum Lipsiensia*, which had been founded specifically for that purpose. Renowned scholars helped to produce the *Acta* from the outset.[8] Published under its original title until 1731 and thereafter as *Nova Acta Eruditorum*, this scholarly journal offered its readers—members of the Republic of Letters[9] who were proficient in Latin—as well original contributions and translations of foreign articles into Latin as reviews and other scholarly news. Mencke's journal was basically conceived as polyhistoric, in accordance with the contemporary idea of universal scholarship. This inclusivity, however, applies only to the section containing reviews; the scientific contributions, by contrast, were weighted heavily towards the natural sciences as well as mathematics and medicine.

Four years later, in 1686, another learned journal published in Latin appeared under the title *Ephemerides litterariae* (Hamburg: Langemack).[10] A special feature of this journal, which was probably founded by the physician Joachim Ludwig Körber and was supported by numerous scholars, was weekly publication with the aim of being up-to-date.[11] Although it

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[7] For a thorough discussion, see Augustinus Hubertus Laeven, *De "Acta Eruditorum" onder redactie van Otto Mencke* (Amsterdam 1986; engl. transl. 1990); for a summary, see Habel 2007 (note 1), 56–60.

[8] A synopsis of the years 1682–1706 can be found in Laeven 1986 (note 7), 267ff.

[9] In addition to representatives of the so-called learned professions, this also included all university students.

[10] Further information can be found in Holger Böning und Emmy Moepps, *Hamburg. Kommentierte Bibliographie der Zeitungen, Zeitschriften, Intelligenzblätter, Kalender und Almanache* . . . (Stuttgart-Bad Cannstatt 1996), 3 vols., I: 97ff.; Holger Böning, *Welteroberung durch ein neues Publikum* (Bremen 2002), 188f.

[11] The *Ephemerides litterariae* evinced the first unmistakable signs of a weekly (or even daily) learned bulletin. This model was only to become permanently established, however, with the publication of the *Neue Zeitungen von Gelehrten Sachen* (Leipzig 1715ff.).

gave clear preference to news from the natural sciences, medicine and history, the journal was nonetheless devoted to all fields of knowledge. Like its parallel edition appearing in French under the title *Ephemerides Sçavantes*, the *Ephemerides litterariae* lasted only long enough to publish six issues.

The first German journal[12] to publish contemporary "curious" knowledge in the national language was the *Gröste Denkwürdigkeiten der Welt Oder so genannte Relationes Curiosae* (Hamburg: Wiering), which was issued between 1682 and 1691 by the compiler and author of novels Eberhard Werner Happel.[13] The *Relationes Curiosae*, a popular-scientific publication, appeared first in the form of a learned supplement to the *Relations-Courier* of Hamburg, one of the leading historical-political newspapers of the day. From 1683 it was also published separately in biennial volumes, owing to its enormous success.[14] With the greatest possible recourse to current scholarly writings, Happel reported on what was new and of interest from virtually every field of knowledge: natural history and medicine, geography, ethnology, technical developments, meteorology, astronomy, jurisprudence, history, and politics, as well as wondrous, peculiar and remarkable occurrences of every type.[15] Enriched by anecdotal and literary comments, the topics covered were presented in adeptly organised thematic segments. Although Happel aimed by his own admission to address a readership of scholars, he nevertheless focused primarily on a public that was not likely to be proficient in Latin (or in other foreign languages) and gave preference to receiving knowledge in a popularised form.

The *Monats-Gespräche* (Leipzig: Weidmann; Halle: Saalfeld), published by the jurist Christian Thomasius of Leipzig under various titles between

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[12] Johann Frisch's *Erbauliche Ruh-stunden* (Hamburg: Heuß), a simultaneously instructive and entertaining weekly publication, had already appeared in German between 1676 and 1680. In the form of fictitious conversations, the journal not only provided information about current events but also offered morally edifying reflections. Frisch's *Ruh-stunden* was thus a precursor of weekly journals devoted to moral topics. See Böning 2002 (note 10), 222ff. For further information, see Böning and Moepps 1996 (note 10), I: 63–68.

[13] For further information, see Böning and Moepps 1996 (note 10), I: 75–87; Uta Egenhoff, *Berufsschriftstellertum und Journalismus in der frühen Neuzeit* (Bremen 2008).

[14] On the complexities of its history of publication and wide reception (imitations and translations), see Böning and Moepps 1996 (note 10), I: 75–78.

[15] Happel quotes many of his sources, including learned journals such as the *Journal des Sçavans* and the *Miscellanea curiosa medico-physica*, in the prefaces to each volume.— Egenhoff 2008 (note 13), 38ff., provides a differentiated evaluation of the topics covered.

1688 and 1690, was the first learned journal in the German language.[16] 28 monthly issues appeared at irregular intervals, addressed by no means only to the scholarly community but also to a wider "educated public". Responsibility for publication was first ascribed to an alleged "Society of the Idle" [Gesellschafft derer Müssigen] and the fictitious editor "E.D.F.U.K."; later the imprint listed Thomasius himself. Thomasius functioned as author and editor all in one until the issue of December, 1689. After stepping down, he was succeeded by his student Johann Jakob von Ryssel.[17] For the first year of publication, Thomasius adapted a well-known format, that of creating a debate between fictitious persons who exchange opinions about their professed impressions of literature. This provided the opportunity to treat selected topics from multiple perspectives. Beginning in the second year, he switched—primarily for practical reasons—to a relatively simpler reporting style that was less demanding in literary terms, "as the previous *journale des scavans* published for several years now in Holland, France, and here in Leipzig have been accustomed to use."[18] This permanently changed the image of the journal: the continuous prose dialogues involving fictitious discussants were replaced by a collection of subdivided and enumerated individual texts for which Thomasius was personally responsible. Aside from critical and satirical contributions, which also included literary feuds with other scholars,

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[16] Title in January 1688: *Schertz- und Ernsthaffter, Vernünfftiger und Einfältiger Gedancken/ über allerhand Lustige und nützliche Bücher und Fragen.* Annual title, 1688: *Freymüthige Lustige und Ernsthaffte iedoch Vernunfft- und Gesetz-mäßige Gedancken Oder Monats-Gespräche, über allerhand, fürnemlich aber Neue Bücher.* On the history and character of the journal, see Robert E. Prutz, *Geschichte des deutschen Journalismus* (reprint of Hannover 1845 edn., Göttingen 1971), 296–333; Georg Witkowski, *Geschichte des literarischen Lebens in Leipzig* (reprint of Leipzig 1909 edn., München 1994), 203–219; Hanns Freydank, 'Christian Thomasius der Journalist', in Max Fleischmann (ed.), *Christian Thomasius: Leben und Lebenswerk* (Halle 1931), 345–382; Thomas Woitkewitsch, 'Thomasius' "Monatsgespräche". Eine Charakteristik', *Archiv für Geschichte des Buchwesens* 10 (1970), 655–678; Martin Gierl, *Pietismus und Aufklärung* (Göttingen 1997), 470–486; Herbert Jaumann, 'Bücher und Fragen. Zur Genrespezifik der *Monatsgespräche*', in Friedrich Vollhardt (ed.), *Christian Thomasius* (Tübingen 1997), 395–404; Habel 2007 (note 1), 60–64 and 453f.

[17] Ryssel attempted to continue Thomasius' work in the same spirit from the end of 1689 but was forced to cease publication of the initially very successful journal as early as April of 1690.—The *Monats-Gespräche* was reprinted in full in the same year in Halle. A further issue was announced in the catalogue for the Easter Fair in 1699 but was apparently never published. See *Catalogus universalis . . . Das ist Verzeichnuß aller Bücher, so zu* [*Franckfurt und Leipzig*] *des jetzigen 1699sten Jahres . . . gedruckt worden sind* (Leipzig 1699), fol. [c4r]. Individual monthly issues were still being reprinted in 1706, for instance the issue of January 1689 (Herzog August Bibliothek Wolfenbüttel: M: Ac 370).

[18] *Monats-Gespräche*, January 1689, 'Vorrede', 27.

discussions of selected new publications were the principal subject matter of the *Monats-Gespräche*. Thomasius was primarily interested in theological, juristic and philosophical works, but also in popular political-historical and edifying writings as well as belle-lettres. Instead of the mere dissemination of information, he offered a combination of argumentation and opinion [*Judicium*]. This combination was the specific feature of his style of discussion, by which he attempted to fulfil the claim expressed in the annual titles of the *Monats-Gespräche* to be simultaneously "forthright", "humorous" and "serious".

The early original German journals presented here doubtless exhibit fundamental similarities based on external factors prescribed by the medium and their focus on scholarly information. As noted above, however, significant differences remain as well, concerning not only the selection of the news presented and the internal organisation of textual matter, but also the publication model chosen and the intended readership (see overview in table below).

The scope of what was considered learned periodicals in the late seventeenth century was relatively broad. Nor did this change by the mid-eighteenth century, when a veritable flood of journals had arrived on the scene. When Johann Andreas Fabricius, himself the editor of such journals, attempted to define them in 1752, he remarked:

> Monthly publications, diaries, *Ephemerides litterarias*, journals, etc. . . . are publications which appear in installments and are particularly concerned with certain scholarly topics. They are of different genres and also have different names . . ., most contain reviews of books, . . . others relate certain occurrences and experiences . . . still others consist of treatises on particular scholarly matters.[19]

In his alphabetically arranged inventory of journals, Fabricius—in strict accordance with his own definition—listed all of the above-mentioned periodicals of the early period, from Nitzsch's Latin translation of the *Journal des Sçavans* to the German-language journals issued by Happel[20] and Thomasius.

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[19] Johann Andreas Fabricius, *Abriß einer allgemeinen Historie der Gelehrsamkeit* (Leipzig 1752–1754), 3 vols., I: 665, 849.—The fifteenth "Hauptstück", 'Von Journalen' (849–944), offers a detailed bibliographical summary in addition to an overview of the "genre".

[20] As the popular-scientific *Relationes Curiosae* apparently marked the outer limits of the learned journal, it was not listed as such in numerous contemporary bibliographies.

Table 1. Early learned periodicals in Germany: similarities and differences

Journal	Duration of publication	Language of publication	Periodicity	Editor, authors	Subject matter	Form	Type of news	Readership
Miscellanea curiosa	1670–1706	Latin	Annual	1 editor + diverse authors	Medicine, natural sciences	Report	Announcements, treatises, illustrations	(Specialised) scholars
Acta eruditorum	1682–1731	Latin	Monthly	1 editor + diverse authors	All fields (medicine, natural sciences)	Report	Reviews, treatises, news, illustrations	Scholars
Ephemerides Litterariae	1686	Latin	Weekly	1 editor + group of authors	all fields (medicine, natural sciences, history)	Report	News, reviews, 2 illustrations	Scholars
Relationes curiosae	1682–1691	German	Every 2–3 days	1 editor (= author)	All fields	Report	Contributions, illustrations	Educated public/ scholars
Monats-Gespräche	1688–1690	German	Monthly	1 editor (= author)	All fields (theology, jurisprudence, philosophy, literature)	Discussion	Reviews, treatises, satire, disputes, illustrations	Scholars/ educated public

Tentzel's Early Contacts with "Learned Journalism"

The polymath Wilhelm Ernst Tentzel (1659–1707), whose learned monthly publications lastingly enriched the German world of journals, came from a prominent Thuringian family of theologians. His biography is in many ways typical of the scholarly world of his time:[21] after completing Latin school and a three-year course of studies in Wittenberg (philosophy, oriental languages, history and ecclesiastical history), he earned a Master's degree in 1679. In 1682 he became an adjunct professor [*Adjunkt*] of the faculty of philosophy. Following the sudden death of his father in 1685, he had to give up this university career that had begun with promise. In 1686 he was called to the gymnasium at Gotha, which gave him a public position that offered security.[22] On the basis of his general scholarship and his extraordinary knowledge of numismatics, he was made supervisor of the princely coin and medal cabinet at the Court of Gotha. After the death of the court historiographer Caspar Sagittarius, Tentzel became his successor in 1694. He subsequently left Gotha and moved to Dresden, where in 1702 he was named a Royal Polish and Electoral Saxon Councillor, archivist, and court historiographer.[23] When he lost these court positions in the following year, he retired to private life.[24]

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[21] Contemporary sources on Tentzel's life and writings: Adolphus Clarmundus [= Johann Christoph Rüdiger], *Vita, & Scripta Clarissimi Viri Wilhelmi Ernesti Tentzelii, . . .* = *Das Leben/ und Schrifften Des sehr berühmten Mannes/ Wilhelm Ernst Tentzels/ . . .* (Dresden and Leipzig 1708); Johann David Köhler, 'Eine Gedächtnis-Müntze auf den hochberühmten Chur-Sächsischen Rath und Geschicht-Schreiber Wilhelm Ernst Tentzeln, von A. 1700', *Münz-Belustigung* 15 (1743), 97–102; Johann Heinrich Zedler, *Grosses vollständiges Universal-Lexicon Aller Wissenschafften und Künste* (Halle and Leipzig 1732–1754), 64 and 4 vols., XLII: 901–906.

[22] On Tentzel's positions in Gotha, see Tentzel in *Saxonia Numismatica oder Medaillen-Cabinet . . . Albertinischer Haupt-Linie* (Gotha et al. 1705), 'Vorrede', fol. b2v–c2v.—In the course of a scholarly dispute, Tentzel makes critical comments on the status of schoolmasters, remarking that it is a pity that they "have to spend time on the burdens of school work. *Sed haec fata sunt eruditorum in Germania*". *Monatliche Unterredungen*, March 1689, 307.

[23] Contemporary evidence can be found in *Nova Literaria Germaniae* 1 (1703, 3), 91: "Celeberrimus *Wilhelmus Ernestus Tentzelius*, antehac Historiographus Ducalis Saxonicus, & ab aliqous mensibus Potentiss. Poloniarum Regi & Sereniss. Saxonum Electori a Consiliis et ab Archivo".

[24] Cautious remarks about his dismissal, which was never entirely clarified, can be found in Rüdiger/Clarmundus 1708 (note 21), fol. C2v. Köhler 1743 (note 21) is more precise, stating that Tentzel lost his position, "when the Saxon Grand Chancellor, Count of Beichlingen, was deposed by his enemies, as he had attempted to make too much of the House of Beichlingen" (100). Köhler alludes here to Tentzel's *Typus Genealogiae*

Tentzel's correspondence with various journal editors in his own country and abroad,[25] his written references to the journals themselves, and the great number of books he was known to have[26] testify to his enthusiastic use of the new medium of learned journals. According to information in an exchange of letters with Otto Mencke, the founder of the *Acta Eruditorum*, Tentzel embarked on a journalistic career in 1685.[27] His first review was published in Mencke's *Acta Eruditorum* in January 1686, when Tentzel was 26 years of age. By 1703, this presentation of a significant work on ecclesiastical history was to be followed by at least 34 further reviews for Mencke's journal—all without exception written anonymously.[28] All reviews written by Tentzel—no less than eight of which were of his own publications[29]—were in fields for which he was qualified to review by virtue of his studies in Wittenberg or his professional responsibilities in Gotha: oriental and classical languages, ecclesiastical and medieval history, genealogy, regional history, geography, and natural history.

A chronologically arranged catalogue of Tentzel's reviews for the *Acta Eruditorum*,[30] including the fields of their subject matter,[31] appears below.

Beichlingicae Plenioris (Jena 1702). For the currently favoured "interpretation" of this affair, see Franz Xaver Wegele, *Geschichte der deutschen Historiographie* (München 1885), 724.

[25] See Rüdiger/Clarmundus 1708 (note 21), fol. B3v–B4r.

[26] Information at least about parts of Tentzel's library can be found in three auction catalogues, the earliest and most interesting of which is the *Catalogus librorum . . . omnium facultatum, manuscriptorumque viri clarissimi Wilhelmi Ernesti Tentzelii, Consiliarii, Historiographi Saxonici, & Polyhistoris* (Weimar 1714).

[27] See Laeven 1986 (note 7), 165.

[28] In accordance with convention in learned journals, reviews in the *Acta Eruditorum* were anonymous on principle. Nonetheless, relatively reliable determination of the authorship of articles can be made on the basis of hand-written names found in the editor's personal copy. See details in Laeven 1986 (note 7), 113ff. and 267–328; Habel 2007 (note 1), 58f.

[29] Self-reviews of one's own work concerned with mere presentation of content were a regular feature of most learned journals.

[30] Books marked with an asterisk * were additionally given far more extensive reviews by Tentzel in his *Monatliche Unterredungen*.

[31] The index of the *Acta Eruditorum* distinguishes the following six fields and groups of fields: I. *Theologica & ad Ecclesiasticam Historiam spectantia*; II. *Juridica*; III. *Medica & Physica*; IV. *Mathematica*; V. *Historica & Geographica*; VI. *Philosophica & Philologica Miscellanea*.

Table 2. Tentzel's reviews for the Acta Eruditorum, 1686–1703

Year and Month	Pages	Author and work reviewed	Field
1686/I	20–23	Mabillon, Johannes: *De Liturgia Gallicana Libri III.* (Paris 1685).	Theology
1686/II	70–74	Le Moyne, Stephanus: *Varia sacra seu sylloge variorum opusculorum græcorum ad rem ecclesiasticam spectantium.* T. 1 (Leiden 1685).	Theology
1686/III	145–148 (= 150)	Le Moyne, Stephanus: *Varia sacra seu sylloge variorum opusculorum graecorum ad rem ecclesiasticam spectantium.* T. 2 (Leiden 1685).	Theology
1686/IV	205–208	Hody, Humfredus: *Contra Historiam Aristeae De LXX Interpretibus Dissertatio* (Oxford/London 1685).	Theology
1686/VII	336–337	Galanus, Clemens: *Historia Armena, ecclesiastica et politica* (Cologne 1686).	History and Geography
1687/III	129–133	*Müller, Andreas: *Speciminum Sinicorum* (s.l. 1685).	Philosophy and Philology
1687/III	135–142	Johannes Parisiensis O.P.: *Determinatio de modo Existendi Corpus Christi in Sacramento Altaris* (London 1686).	Theology
1687/VI	303–305	Harduin, Joannes: *De baptismo quaestio triplex* (Paris 1687).	Theology
1687/VIII	445–455	Grotius, Hugo: *Dissertatio de coenae administratione, ubi pastores non sunt* (London 1685).	Theology
1687/X	541–543	Tentzel, Wilhelm Ernst: *Iudicia eruditorum de symbolo Athanasiano* (Frankfurt a.M./Leipzig/Gotha 1687).	Theology
1687/XII	668–670	Spanheim, Fridericus: *Historia Imaginum Restituta, Praecipuè Adversus Gallos Scriptores nuperos Lud. Maimburg et Nat. Alexandrum* (Leiden 1686).	Theology
1688/II	74–76	*Martyrologium Eccelisa Germanica pervetustum quod per septigentos annos delituit in publicum* (Augsburg 1687).	Theology
1688/III	125–128	Usserius, Jacobus: *Opuscula duo, nunc primum Latine edita, alterum de Episcoporum* [*et*] *Metropolitanorum Origine, alterum de Asia Proconsulari* (London 1687).	Theology
1688/III	132–139 (= 140)	Simon, Richardus: *Fides ecclesiae orientalis seu Gabrielis Metropolitae Philadelphiensis opuscula* (Paris 1686).	Theology
1688/VI	334–335	Pfanner, Tobias: *De catechumenis antiquae ecclesiae liber* (Frankfurt a.M./Leipzig/Gotha 1688).	Theology
1688/VIII	444–447	Larroque, Matthaeus [de]: *Adversariorum sacrorum libri tres opus posthumum* (Leiden 1688).	Theology
1688/VIII	447–450	Aletophilus, Gothofredus: *Die über Hundert Jahr Ihren Widersachern unsichtbar gewesene, nunmehro aber… zerstreuete Evangelische Tefferеckerthal-Kirche* (Denckstatt [Leipzig?] 1688).	Theology

Table 2 (*cont.*)

Year and Month	Pages	Author and work reviewed	Field
1690/VI	291–295	*[Mabillon, Johannes]: *Museum Italicum, seu collectio veterum scriptorum ex bibliothecis Italicis.* T. 2 (Paris 1689).	Theology
1691/VIII	361–374	*Ludolf, Hiob: *Commentarius ad Suam Historiam Aethiopicam* (Frankfurt a.M. 1691).	History and Geography
1692/XI	539–542	*Tentzel, Wilhelm Ernst: *Exercitationes selectae* (Leipzig 1692).	Theology
Suppl. I[32] 1692/1	15–19	Tentzel, Wilhelm Ernst: *Epistola ad Amicum, qua Responsio ad Clarissimi Viri Emanuelis a Schelstrate* (Gotha 1687).	Theology
1692/8	431–432	Antelmy, Josephus: *De veris operibus SS. PP. Leonis Magni et Prosperi Aquitani dissertationes criticae* (Paris 1689).	Theology
1692/9	495–496	St. Joannes Chrysostomos: *Epistola ad Caesarium Monachum* (Paris 1689).	Theology
1693/VI	280–284	*Ludolf, Hiob: *Appendix ad Suam Historiam Aethiopicam illiusque Commentarium* (Frankfurt a.M. 1693).	History and Geography
1697/I	10–14	*Tentzel, Wilhelm Ernst: *Epistola de sceleto elephantino Tonnae nuper effosso*. Ed. secunda (Jena 1696).	Medicine and Physics
1700/IV	152–155	Tentzel, Wilhelm Ernst: *Discours von Erfindung der löblichen Buch-Drucker-Kunst in Teutschland* (Gotha 1700).	History and Geography
1700/IV	155–158	Tentzel, Wilhelm Ernst: *Der Sächsischen … Stamm-Mutter, Frauen Margarethen, Chur-Fürstin zu Sachsen, gebohrener Ertz-Hertzogin zu Oesterreich warhafftiger Todes-Tag* (Gotha 1700).	History and Geography
1700/IV	158–161	Sagittarius, Caspar: *Historia Gothana Plenior Ex optimis quibusque editis Scriptoribus … Concinnata* (Jena 1700).	History and Geography
1700/VI	271–274	Grabe, Johannes Ernestus: *Spicilegium SS. Patrum, Ut et Haereticorum, Seculi post Christum natum I. II. and III* (Oxford 1699).	Theology
1700/VI	274–284	Tollinus, Jacobus: *Epistolae Itinerariae* (Amsterdam 1700).	History and Geography/ Philosophy and Philology

[32] *Actorum Eruditorum quae Lipsiae publicantur Supplementa* (Leipzig 1692), vol. I.

Table 2 (*cont.*)

Year and Month	Pages	Author and work reviewed	Field
1700/VIII	380–381	Lloyd, Guilielmus: *Series Chronologica, Olympiadum, Pythiadum, Isthmiadum, Nemeadum, Quibus Veteres Graeci Tempora Sua Metiebantur* (Oxford 1700).	History and Geography
1700/X	446–448	Ciampini, Joannes: *Vetera monimenta, in quibus praecipue musiva opera sacrarum, profanarumque aedium structura . . . illustrantur.* T. 2 (Rome 1699).	Philosophy and Philology
1701/IV	162–164	Tentzel, Wilhelm Ernst: *Supplementum Historiae Gothanae primum* (Jena 1701).	History and Geography/ Philosophy and Philology
1701/X	433–436	Tentzel, Wilhelm Ernst: *Supplementum Historiae Gothanae secundum* (Jena 1701).	History and Geography
1703/VI	285–288	Rudbeck, Olav: *Nora Samolad sive Laponia illustrata* (Uppsala 1701).	History and Geography

In addition to his review work for Mencke's journal, Tentzel also made a name for himself as a contributor to the *Observationes selectae ad rem litterariam spectantes* (Halle: Renger), a professional journal published in Latin between 1700 and 1705 and edited by scholarly associates of Christian Thomasius in Halle. Although these contributions also appeared anonymously, Tentzel's contemporaries were aware of his authorship.[33]

Tentzel and His *Monatliche Unterredungen*

It was probably the success of another German-language periodical—the *Monats-Gespräche*, which first appeared in 1688—that provided the impulse for the founding of the *Monatliche Unterredungen*, edited by Tentzel and first published in 1689. Inspired by the good reception of Thomasius' *Monats-Gespräche* published by Moritz Georg Weidmann, Johann Friedrich Gleditsch—who together with Johann Grosse had already printed and distributed in 1682 Mencke's *Acta Eruditorum*—came up with the idea of a competitor journal.[34] How the connection to Tentzel was

[33] See Caspar Heinrich Starck, *Ad V. Cl. Vincentii Placcii Theatrum Anonymorum epimetron . . .* (Rostock and Leipzig 1716), 15, 17 and 19.

[34] Contemporary observers of the market voiced this suspicion early on. An explicit and very critical statement on this competitive situation was made by Christian Thomasius in

established and how the business details were arranged is not clear. But from what we do know, it can be inferred that their partnership was highly complementary: on the one hand was the ambitious and business-savvy bookseller and publisher who had already gained positive experience with the new medium and how to market it; on the other hand was the young scholar and schoolmaster who not only offered outstanding credentials as a recognised polymath and contributor to Mencke's *Acta*,[35] but who also sought an opportunity to earn money and, above all, to attain renown as a scholar.[36]

Tentzel's decision in early 1689 to establish his own German-language journal was a milestone in the development of journal publishing in German-speaking Europe. Managed, financed and marketed by different booksellers and publishers in Leipzig,[37] the *Monatliche Unterredungen* was to be the first learned journal in the German language consistently devoted to almost all areas of scholarship on the model of the *Journal des Sçavans* in Paris. Tentzel's journal, which was unmistakably inspired by Thomasius' *Monats-Gespräche* not only with respect to its design and title[38] but also in its openness to a broader readership,[39] was an extraordinary success from the outset in both professional and financial terms. It was consequently able to maintain a strong position on the market. The facts speak for themselves: the *Monatliche Unterredungen* was published for more than a decade in a largely unaltered format.[40] Twelve issues were

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Weitere Erleuterung . . . wegen der neuen Wissenschafft/ Anderer Menschen Gemüther erkennen zu lernen (Halle 1692): He reports that there were booksellers "who encouraged others to imitate my fashion of writing and to discuss new books in the German language and in the form of monthly conversations." They sought people who, for the sake of successful sales, were "to attack" the *Monats-Gespräche*. But "no one here [wanted] to do this for a good while, until the *Monatliche Unterredungen* . . . saw the light of day in 1689" (2f.).

35 Tentzel was also a good choice in so far as he dealt somewhat effectively with a fundamental problem faced by all learned journals—the (cost-intensive) acquisition of books: He possessed a considerable library of his own and also had largely unrestricted access to the extensive princely court library in Gotha. See Rüdiger/Clarmundus 1708 (note 21), fol. [C4r], B3r–v.

36 It was quite common for young academics, often of little means, to seek both a livelihood and career opportunities through learned journals.

37 For further details, see notes 47–49.

38 A prolonged scholarly feud arose between Thomasius and Tentzel as a result, from which Tentzel sustained most of the damage. See Goetten 1718 (note 1), 62ff.

39 Tentzel again takes up this aspect, when he launches his second journal. Here he addresses *expressis verbis* "people from other *professions*, [in addition to] scholars", who "might be served by my work". *Curieuse Bibliothec* 1 (1704, 1), [2].

40 With an initial print run of probably 500 copies, the price per copy, as communicated by the publisher Gleditsch to Leibniz on 16 April 1692, was 2 Groschen. See Gottfried Wilhelm Leibniz, *Sämtliche Schriften und Briefe*, series 1: *Allgemeiner politischer und*

published annually with as much regularity as possible, each with a carefully crafted frontispiece,[41] and complemented at the end of the year with a summary of the year in review and a three-part index for the entire volume.[42] Cessation of publication in December 1698 was due partly to the publisher's desire for a new concept but also to the circumstances of Tentzel's personal life.[43]

Demand for the first monthly issues, which seem to have gone rapidly out of print, was so great that parallel editions were published immediately. As early as 1690 a corrected reprint of the entire first year of the journal appeared. The issues for this year and for later years as well were published—completely or in part—by different publishers and in different formats, both as parallel editions and as reprints. In addition, a Dutch translation of the first year of the journal appeared in 1703.[44] It can thus be assumed that the *Monatliche Unterredungen* had an extraordinarily high circulation. It has been shown that reprints, at least of individual issues, were still produced as late as 1709 and 1710, more than a decade after publication had ceased.[45]

The unusually large distribution of Tentzel's journal, even today, is evidence that it also found its way onto the acquisition lists of public and private libraries at an early point. Obviously, the *Monatliche Unterredungen* had not taken long to become an established "institution" in the scholarly world. It was not for nothing that Tentzel succeeded in launching

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historischer Briefwechsel, ed. by Leibniz-Archiv der Niedersächsischen Landesbibliothek Hannover (Darmstadt and Berlin 1923ff.), vol. VIII, 226 (no. 125).—The following figures for the *Acta Eruditorum*, provided in Laeven 1986 (note 7), 245 and 108, can serve as a basis for comparison: Print run of approximately 800–1,000 copies, price per copy approximately 2–2 ½ Groschen.

41 Thomasius had already found through experience with his *Monats-Gespräche* that the contemporary reading public greatly valued appropriate illustrations and expected at least a frontispiece. At the end of the first year of publication, he stated expressly that his readers had regretted the lack of copperplate engravings. He had thus made an effort to "repair this *defect re integra* and supply a copperplate engraving for each month's issue". Introduction for 1688, 'Erklärung des Kupfer-Titels', fol. (0)(0)3v.

42 There was an index of books, one of authors, and one of subjects.

43 For details, see p. 310f.

44 Publication of this translation was arranged by Simon de Vries, a schoolmaster from Utrecht, under the title *Kort begrijp en 't voornaemste margh van allerley onlanghs uytgekomene boecken in verscheydene talen en gewesten van Europa; … Uytgekipt en vertaeld uyt de Maendlycke gespraecken over allerley boecken &c., van den seer geleerden en vermaerden Heer Tenzelius* (Utrecht: van Poolsum, 1703).

45 A reprint of the December 1694 issue carried the following information on its imprint page: Frankfurt/Leipzig: Philipp Wilhelm Stock, 1710.—Stock was also the publisher of the sequel of the *Monatliche Unterredungen* that was discontinued in 1707/1708.

the *Curieuse Bibliothec*, a successor journal modelled on the *Monatliche Unterredungen*, through a new publisher in 1703/04. And in 1708, after Tentzel's death, the *Ausführlicher Bericht von Allerhand Neuen Büchern* represented yet another attempt to establish a successor journal.

The *Monatliche Unterredungen*: The Physiognomy of a Learned Journal

The "promotionally effective" title pages of the *Monatliche Unterredungen*, which carried the same information for the entire life of the journal, conveyed an initial and highly instructive impression of the content of Tentzel's journal. Here potential readers and buyers could find not only information about the journal's programme—through the wording of the title—and about those responsible for the journal's production but also information about the frequency of publication, subject matter, and format. The title page of each issue was complemented by a one-page frontispiece—not only to stimulate interest among buyers but also to illustrate subject matter.[46] The basic information conveyed by the title page and the frontispiece (see fig. 1) made the *Monatliche Unterredungen* recognisable as a learned journal typical of its time, with the following specific features:

1. *Publisher/editor*: The respective publishers—initially Johann Christian Laurer[47] from Thorn, probably just a prête-nom, and a little later Johann Friedrich Gleditsch[48] from Leipzig and finally his stepson Thomas Fritsch[49]—were mentioned on the title pages for the entire duration of

[46] On illustrations in learned journals, see Habel 2007 (note 1), 189–204.

[47] Johann Christian Laurer, who settled as a foreign bookseller in Thorn from 1687, appeared on the title pages only for the first year of the journal's publication. Although he appears as the sole publisher of the journal in the issue for January/February 1689, he asks readers to submit learned news to the bookseller Gleditsch in Leipzig. Witkowski 1909 (note 16), 220 suspected that Gleditsch sought a publisher colleague located in Prussia whose name could be put forward in the event of possible problems with the Saxon authorities.

[48] Gleditsch's name appeared on the cover from March 1689 alongside Laurer's, since Tentzel's Journal proved to be harmless from the point of view of censorship. From 1690 onwards Gleditsch openly came forward as the sole publisher.

[49] Gleditsch turned over the old publishing business which he had acquired by marriage to his stepson Thomas Fritsch in 1694 and founded his own highly successful publishing business. See Adalbert Brauer, *Weidmann 1680–1980* (Zürich 1980), 24. Accordingly, from January 1694 the name Fritsch appeared on the cover of the *Monatliche Unterredun-*


Monatliche
Unterredungen
Einiger
Guten Freunde
Von
Allerhand Büchern und andern
annemlichen Geschichten;
Allen Liebhabern
Der Curiositäten
Zur
Ergetzligkeit und Nachsinnen
Heraus gegeben
Von
A. B.
JANUARIUS 1689.
Sine censurâ & approbatione Auctoris.
Der andere Druck von Fehlern gereiniget.
In Verlegung
Johann Christian Laurers/ Buch-
händlers in Thoren/
Auch zu finden bey Joh. Friedrich Gleditschen/
Buchhändlern in Leipzig/ 1690.

Fig. 1. *Monatliche Unterredungen*, Frontispiece (Scholarly discussion) and title page (fictitious editor "A.B."). 2nd rev. edition of the first monthly issue (Jan. 1689). Niedersächsische Staats- und Universitätsbibliothek Göttingen.

the journal's publication. Their influence should by no means be underestimated. They not only financed the *Monatliche Unterredungen* but also intervened occasionally and with lasting consequences where the content and programme of the journal were concerned. And they were the ones who designated the editor as well as several additional associates. In contrast to the publisher, Tentzel, the editor and author, hid his identity during the first year of publication behind a changing pattern of initials running through the entire alphabet from "A.B." to "Y.Z."[50] From the second year of publication onwards, he refrained from using any form of identification. As he himself asserted, these forms of conventionalised

gen, first together with that of Gleditsch, and then alone from May onwards. Remarkably, however, the parallel editions for the year 1689 already showed the publisher's name as Thomas Fritsch!

[50] Use of these initials provoked heavy contemporary criticism. See Juncker 1692 (note 1), 269.

anonymity would protect him from having to justify himself and his journal (see January 1690, 4).[51] Despite all attempts to hide his identity, however, his editorship and authorship quickly became known.[52]

Although Tentzel was undoubtedly the main author of the *Monatliche Unterredungen*, there is much evidence that additional authors were also called upon. For the year 1696, at least, Tentzel announced that he and a good friend would each produce six issues in monthly alternation (see April 1696, fol. [T1v]).[53] For the final issue that appeared in 1698, Tentzel was replaced by another author.[54]

2. *Periodicity and continuity*: In order to keep readers and above all buyers loyal to the journal, those responsible for its publication made efforts to ensure that it appeared not only continually but also regularly. They were by and large successful in the case of the *Monatliche Unterredungen*. Eleven normal monthly issues appeared, followed by a December issue with a summary of the year and indexes. With the exception of natural disasters that hindered contact between Gotha and Leipzig, delays in production of the journal were caused primarily by Tentzel's own editorial problems and scheduling conflicts. In 1693 and 1694, when the Palatinate War of Succession (1688–1697) took a heavy toll on the book market, the journal project almost came to an end. Following the intervention of "distinguished *patrons* and good friends" (January 1694, 3), Tentzel found a solution to the difficulties by presenting older books along with new ones and publishing two issues simultaneously over a certain period (see June 1694, 510). From 1696, owing first to the publisher's desire to integrate topics from new areas (see below) and then to Tentzel being increasingly overworked, there was a noticeable lag in delivery of the journal that ultimately could not be made up and hence brought about the end of the *Monatliche Unterredungen*.[55]

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[51] On the issue of anonymity in learned journals, see Habel 2007 (note 1), 126–149.

[52] See Juncker 1692 (note 1), 261f.—The polymath Johannes Reiske, who felt that he had been judged wrongly by the *Monatliche Unterredungen*, made Tentzel's responsibility known as early as 1690.

[53] The concept of alternating authorship led to delays in publication and ultimately failed in terms of both organisation and content. See Tentzel's comments in the issue for December 1696, 939. His remarks about this in a letter to Leibniz dated 21 December 1696 are even more explicit; see Leibniz 1923ff. (note 40), vol. XIII, 421 (no. 273).

[54] On the final issue of the *Monatliche Unterredungen*, see p. 310.

[55] In a letter to Leibniz on 21 November 1696 Tentzel admitted to major problems with his impatient publisher owing to delays, and stated that he could not exclude the possibility that the *Monatliche Unterredungen* might have to cease publication in the course of that year. See Leibniz 1923ff. (note 40), vol. XIII, 359 (no. 239).

3. *Programme and subject matter*: The subtitle *Von Allerhand Büchern und andern annemlichen Geschichten* [On all types of books and other agreeable matters] says little of a concrete nature about the actual content of the journal.[56] This was intentional; the afterword to the first issue stated that a programmatic preface defining the content of the issue was purposely omitted so that "the reader would likely be motivated to read the book for himself" (January 1689, 154). In accordance with Tentzel's polyhistoric self-image, the *Monatliche Unterredungen* was to offer the widest possible range of contributions for—as emphasised in the subtitle—"all connoisseurs of curiosities" (i.e. interesting news). Tentzel gave preference to fields to which he himself had the best access. In the preface to the journal for 1693, he made no secret of the fact that he would concern himself "for the most part [with] those books and subjects that dealt with ecclesiastical, civil, natural and literary history" (January 1693, 2). In addition, there was also a place for the numismatic and paleontological subjects, which are still linked with Tentzel's name today. After Thomas Fritsch had succeeded his stepfather Gleditsch as publisher in 1694, he attempted to expand the scope of the *Monatliche Unterredungen*. Beginning with the year 1696, he intended to include novels as well as permanent sections devoted to jurisprudence, mathematics, medicine, and the military science.[57] This experiment began with the January issue but lasted for only a year, after which the journal reverted to Tentzel's original concept.

4. *Types of news and text*: Even though Tentzel composed his learned contributions in the form of casual conversations (see below), the fictitious discussions nevertheless contained *de facto* very different types of news. Tentzel's journal included different types of text typical of early learned journals; they were distinguished in terms of content, layout and typography. In concrete terms, the *Monatliche Unterredungen* contained the following types of text:

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[56] The invitation contained in the publisher's message to readers to "make known their own assessments of books and other noteworthy *observationes* from the realm of *curiosities*" (January 1689, [2]) was likewise unspecific in terms of content.

[57] The projected expansion of scope was taken up in an introductory discussion at the beginning of the year (see January 1696, 3f.). The reason for also including novels was rooted in the interests of the publisher: As Fritsch had lost many authors of scientific writings from the old publishing house to Gleditsch, the authors of novels, who had largely remained with Fritsch, were to be brought to public attention through reviews.

Type of news (discussion format except for prefaces and indices)
• Preface (occasionally with editorial announcements)
• Presentation of new (sometimes old) books (occasionally with illustrations)
– Book reviews
– Excerpts, summaries
– (critical) reviews
– Book announcements
– Information about new publications
– Announcements of own publications
– Announcements of prohibition of publications
• Other learned news (occasionally with illustrations)
– from/about institutions
– from/about people
– from/about scientific innovations
– from/about projects
– from/about libraries, art collections, cabinets of curiosities
• Treatises, essays
• Opinions, counter-criticism
– reactions, critical responses
– (second) reviews
• Retrospect, review of the year
• Index

In addition to its primary focus on books, the *Monatliche Unterredungen* featured learned news and critical responses. The presentation of new (and sometimes older) works took the form of either excerpts and summaries of content or critical debates of varying length. Other news from the scholarly world appeared in the form of brief announcements and reports, but more comprehensive contributions and prints of manuscripts, bibliographies, library catalogues and scholarly correspondence were common as well. Critical exchanges consisted of both readers' opinions and the journal's responses.

By announcing that the focus of the *Monatliche Unterredungen* was on "discussions of as well as frequent impartial debates on new books" (January 1689), Tentzel described his journal's approach quite accurately. The journal communicated and discussed a broad range of scholarly news.

5. *Discussion format*: The discussion format indicated by the title of the *Monatliche Unterredungen*, which was deliberately modelled on Thomasius' *Monats-Gespräche*, was part of a literary tradition with which contemporaries were very familiar. Tentzel's brief introductory statement could therefore hardly have missed its aim and—as reflected in the

frontispiece of the first issue—is likely to have engaged readers in the fiction of a discussion from the outset:

> In a renowned city in Germany, two good friends [Mssrs. *Leonhard* and *Antoni*] who were men of great *curiosity* in the current fashion and who enjoyed discussing new developments and new books [decided to meet once each month and] to make their discussions available to others in print (January 1689, 3).

Tentzel knew how to perfect the fiction of these ongoing discussions by continually introducing new interlocutors: scholars from all four faculties, travellers and incidental guests, even a "gentlewoman" who presented novels. The discussion format did more than just respond to a contemporary fashion; it also offered various concrete advantages:[58] first was the aspect of entertainment,[59] as indicated by the catchword "pleasure" [Ergetzlichkeit] on the title page, with reference to the reader. Tentzel left no doubt about this intentional connection: as stated in an early preface, he purposely made disorganisation—i.e. the associative give-and-take of "*familiar* discussions"—an element of style, which took into account "not only the reader's contemplation but also his pleasure" (January 1690, fol. A3v). Second, this format made it possible to juxtapose arguments and assessments from multiple perspectives so that opposing positions could be harmonised, at least in a *pro forma* fashion.[60] Third, it provided important protection against unpleasant criticism. As Tentzel maintained:

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[58] As early as the issue of February 1688 of his *Monats-Gespräche*, Thomasius was already entertaining interesting programmatic thoughts about modes of presentation: Because with every book "some reasonable and some simple and foolish *judicia*" will be made (244), "it would not be inadvisable if one were to touch on both the simple as well as the reasonable *judicia* in the German *journal*; and in order for this to pass off well, it would suit such a *journal* to be presented in the form of a conversation" (244f.). For in the resulting give-and-take of opinions the authors under review "would seldom be able to touch the *journalist* . . ., if he had not made any clear determinations . . . People who are impartial and judicious [would] undoubtedly see in which direction the *journalist* had reflected most, whereas those who are partial would each find something that they could take a hold of as if the *journalist* were on their side" (245f.).

[59] Tentzel repeatedly justified his intention to provide entertainment, for example in a review of Fabricius' *Scriptorum recentiorum Decas* (Hamburg 1688): "Now every person is bound to seek the best for his neighbour. If he wishes to do so in a beneficial and fruitful way, he must appeal to people's *humour*; one can usually achieve more with *piquant* words and a laugh than with the greatest *Catonian* gravity" (February 1689, 201).

[60] This procedure served to defuse the criticism that a reviewer set himself up as a judge of others in the Republic of Letters, where all scholars were to be considered equal. See Thomasius (note 58), 245.

"If I fashioned the discussions in my own head, they would turn out quite differently than they do" (January 1690, fol. A3v).

In 1692 and 1694 Tentzel considered giving up the time-consuming and labour-intensive discussion format in favour of reviews and news in the usual style of reporting. With the exception of a single issue,[61] however, he retained the established format—in the end undoubtedly for marketing reasons: on the one hand, because "what judicious people have enjoyed for three years . . . should not [now] displease them" (January 1692, 2) and, on the other hand, because it did not seem advisable to change "the title of the *Unterredungen* now that it had been sent out into the world and become known" (March 1694, 151).

6. *Sine censura & approbatione*: The additional notice reading *Sine censura & approbatione auctoris*, which was printed beneath the month in each issue, had nothing to do with official censorship but was directly linked with the choice of the discussion format. It adopted the fiction that the editor—as in a normal discussion—allowed each participant to express his unvarnished opinion and was thus not responsible for individual judgements.[62] Various critics took offence at this apparent precautionary measure.[63] Tentzel retained this notice until the end of 1693, after which it was eliminated without comment.

7. *Frontispieces/illustrations*: The copperplate engravings contained in the monthly issues—normally in the frontispiece at the beginning, and in 1693 as illustrations in the text—served primarily to illustrate the main topics addressed in the journal.[64] In addition to the originally predominant purpose of entertainment,[65] Tentzel increasingly exhibited the scientifically based intention to clarify and document subject matter. In doing so he was visibly striving to establish a comprehensible relationship between

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[61] The whole issue for July of 1695 was devoted to Tentzel's description of coins; it offered a "Brandenburgian *Numismata* . . . instead of a monthly discussion" (July 1965, 529).

[62] At the start of the second year, Tentzel remarks in the preface: My intention "in printing the words *Sine Censura & approbatione Auctoris* each month is to give the scholarly world sufficient notice that as the matters treated here and the *censure* given are arranged not so much by my own judgement and inclination as by that of others, they must be assessed and understood accordingly" (January 1690, 5).

[63] See Juncker 1692 (note 1), 261f.—Tentzel still justified "the *protestation* made on the title page which many have mocked, *sine censura & approbatione auctoris*" 15 years later when he launched the *Curieuse Bibliothec* (1 [1704, 1], Preface, fol.) (r).

[64] Tentzel is very clear regarding this purpose of illustration: "Just as we present a thing to our minds through *imagination* or fancy, we can also well present it to our eyes by means of a painting or a copper engraving" (December 1689, 'Anhang', 1250).

[65] Tentzel speaks of copper engravings showing "mostly amusing affairs". Ibid.

text and illustrations. When copper engravings were made according to Tentzel's specifications, they were referred to in the accompanying text. When copper engravings from other sources were re-cut, an additional notice about their origin and content was included. In specific cases Tentzel drew upon available illustrations but had some parts of them changed in order to make his position clear.[66]

Tentzel's procedure can be illustrated by a concrete example. In his presentation of Christian Franz Paullini's *Zeit-kürtzende Erbauliche Lust* (Frankfurt/M. 1697), part 3, the discussion turns to the spectacular concepts of aeronautics and to Philippus Lohmeier's disputation on the subject.[67] As Tentzel remarks, Lohmeier has demonstrated "that a wooden ship could actually lift off from the earth and ascend into the air with people on board, go far above the highest mountains and towers, [and] sail back and forth to far-off lands". Anyone wishing to see such an airship need only consult "*Happelii Relationes curiosas Part. IV. p. 309.*" The reader "will hopefully not disagree if we borrow it from there for the current month's copperplate engraving" (September 1697, 766). This was precisely what Tentzel did for the frontispiece of the September issue, which showed a laterally reversed partial re-cut of the above-mentioned copperplate engraving from Happel's journal (see fig. 2).

The End of the *Monatliche Unterredungen* and the Founding of the *Curieuse Bibliothec*

Without offering any explanation to its readers, the *Monatliche Unterredungen* ceased publication at the end of 1698. The last issue appeared without a frontispiece and was noticeably different in style and quality from the journal that had preceded it and which had earned considerable plaudits. While the new author installed by the publisher to replace Tentzel[68] was unsuccessful in continuing the *Monatliche Unterredungen*,

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[66] Active intervention in the contents and design of illustrations is clearly pointed out in the text. For example: "we thus want to make the drawing and have it placed with the engraving at the head of our Month as the first and principal figure" (April 1696, 303).

[67] Philippus Lohmeier, *Exercitatio Physica De Artificio Navigandi Per Aerem* (Rinteln 1676, reprint Wittenberg 1679).

[68] Relations between Fritsch, the pestering publisher, and Tentzel, the overburdened editor, had been tense since the imposed and unsuccessful change of concept in 1696. Owing to his professional and scientific commitments, Tentzel was not in a position to make the major effort necessary to return the journal to its previous successful course. Tentzel himself was vague about his "resignation". In a letter of 21 November 1698, he

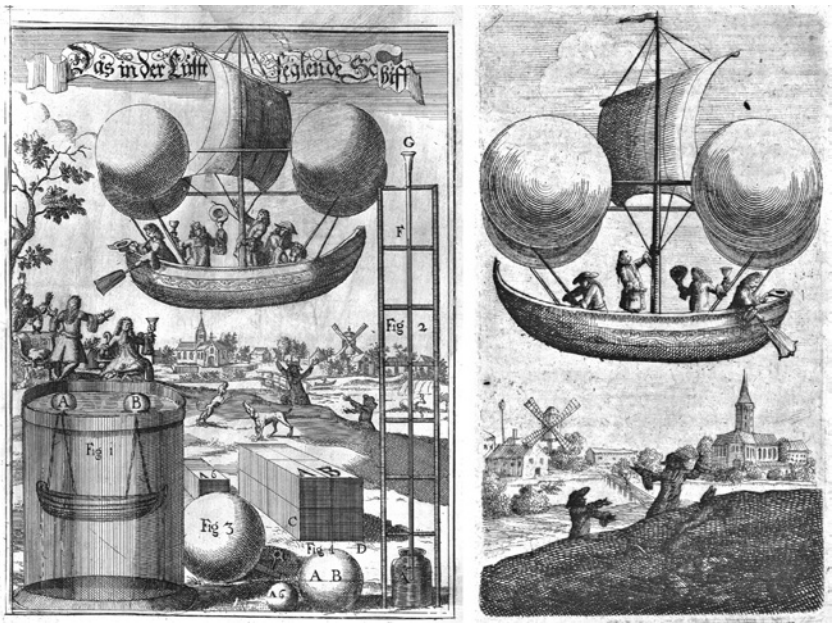

Fig. 2. Illustrations of aeronautics:
– Left: *Relationes Curiosae* (part IV [1689], num. 39, p. 309)
– Right: *Monatliche Unterredungen* (Sept. 1697, Frontispiece).
Niedersächsische Staats- und Universitätsbibliothek Göttingen.

Tentzel decided immediately to start a sequel to his journal.[69] But he was unable to find a publisher, even though he intended to renounce the conversational style in favour of a more modern method of presentation. Only in 1703, after the loss of his remunerative position as an archivist at the court in Dresden, did Tentzel again attempt to launch a learned journal.

In the same year after his forced retirement to private life, Tentzel set about founding a new journal together with the publisher Philipp

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wrote the following ominous sentence: "It is known what *fatalities* have befallen the *Monathl. Unterredung*"; printed in Friedrich Rudolphi, *Gotha Diplomatica, Oder Ausführliche Historische Beschreibung . . .*, ed. by Hans Basilius von Gleichenstein (Frankfurt and Leipzig 1717), vol. I, 'Vorrede', 4. In the first preface to the *Curieuse Bibliothec* he later wrote that the *Monatliche Unterredungen* had had "greater *applausum*" than expected, but that he had nonetheless had "strong and important reasons to cease publication after ten years" (1 [1704, 1], fol.) (v).

[69] In a letter of 2 July 1699 Tentzel informed Leibniz that he could issue a new journal beginning in 1700, provided that a competent publisher could be found; see Leibniz 1923ff. (note 40), vol. XVII, 323 (no. 205).

Fig. 3. *Curieuse Bibliothec, oder Fortsetzung der Monatlichen Unterredungen* Frontispiece (The Old-Saxon pagan god Krodo) and title page (no date). Last issue published under Tentzel's name (3rd repository, 9th section [1706]). Niedersächsische Staats- and Universitätsbibliothek Göttingen.

Wilhelm Stock from Frankfurt, who was seeking to establish himself in Leipzig. Known as the *Curieuse Bibliothec*, the journal came on the market in 1704,[70] publishing twelve issues annually according to the editor's preface. Tentzel was responsible for it until September 1706: under his own name and full title as court historiographer (see fig. 3). Regular publication became increasingly difficult, however, owing to his rapidly failing health. A new editor—Johann Gottlieb Krause, who had begun studies in Leipzig in 1705—was thus given responsibility for the journal beginning with the October issue. Krause, who later produced such distinguished journals as the *Neuer Bücher-Saal der Gelehrten Welt* (Leipzig: Gleditsch and Weidmann, 1710–1717) and the *Neue Zeitungen von Gelehrten Sachen* (Leipzig: Grosse and Georgi, 1715–1784) very successfully, compiled three monthly issues which could at best be characterised as an emergency

[70] Despite the fact that they are dated differently on the title pages, the first two monthly issues already appeared in November 1703; see *Nova literaria Germaniae*, February 1704, 58.

solution before the publisher discontinued publication of the *Curieuse Bibliothec*.

The deliberately chosen subtitle "*oder Fortsetzung der Monatlichen Unterredungen*" [or continuation of the Monthly Conversations] made clear that Tentzel sought to draw directly on the success of his original learned journal.[71] Hence there was no need to develop a fundamentally new concept; the public, who sought a replacement for the earlier journal, could be presented with a format that was largely identical. Thus in his introductory preface describing the content of the *Curieuse Bibliothec*, Tentzel wrote that the journal would offer "*reviews* of old and new books of all sorts, especially those dealing with religious and worldly history as well as *literary* and *natural* topics." He added that he would also include other texts to the extent that they were "either *curieux* and useful or written by famous *auctores*" (1 [1704, 1], fol. [(2r–v)]). Moreover, there was to be a wide variety of other learned news, so that readers could find the same types of text as had been offered by the *Monatliche Unterredungen*. Tentzel did, however, make one major change according to plans already laid in 1699: instead of the labour-intensive discussion format he adopted the "modern" format of articles written in the style of critical reports. The public—as Tentzel wrote with some self-confidence—would now question the assessments of the author himself and "accept or reject them as they pleased" (ibid., fol. [(2r)]).

The *Curieuse Bibliothec* never enjoyed the same renown as the *Monatliche Unterredungen*.[72] In the years after the loss of his official positions, Tentzel lacked the financial and other resources necessary to achieve such recognition for his new journal. In response to a criticism in this regard,[73] he wrote in a review that in Dresden he received neither sufficient new and good books nor did he have a library such as that in Gotha at his disposal (see 3 [1706, 5], 191f.). Nonetheless, his second journal, which faced no significant contemporary competition, was successful enough for the

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[71] It is also symptomatic that the first issue of the *Curieuse Bibliothec* contains the words "Monatliche" and "Unterredungen" as column titles, as if this was still the predecessor journal. Moreover, it should be noted at this point that Tentzel himself continued to speak of his "Monate".

[72] For Johann Georg Eckhart, who had himself edited a widely appreciated learned journal known as the *Monatlicher Auszug* (Hannover: Förster, 1700–1702), already the first issue was considerably less informative than the *Monatliche Unterredungen*; see Leibniz 1923ff. (note 40), vol. XXII, 103 (no. 74).

[73] Burkhard Gotthelf Struve, *Introductio ad notitiam rei litterariae* (second edn. Jena 1706, third edn. 1710), 284f.

publisher to bring out a successor, known as the *Ausführlicher Bericht von Allerhand Neuen Büchern*, immediately after the *Curieuse Bibliothec* ceased publication. With the once again purposely formulated subtitle "*zu Fortsetzung der Monatlichen Unterredungen . . . und Curieusen Bibliothec*", the new journal—which Stock continued to market until 1710—as a matter of course invoked its well-known predecessors that had been founded by Tentzel.

The Exceptional Nature and Reputation of Tentzel's Journals

Tentzel's journals, which maintained their position on the book market until their author's death, not only enjoyed unusual circulation for their time but also earned a notable reputation as a scholarly "news network". They were a fixed frame of reference in the contemporary knowledge discourse whose sources and evidence were beyond question. This earned them a particularly noteworthy position among early German-language journals, strongly confirmed by their widespread reception over several decades. Tentzel—undoubtedly in consultation with his publishers—developed a model for disseminating knowledge through journals that matched precisely the demands and expectations of a specific readership. His success was based on the idea of not only adopting established patterns and conventions but also combining them and varying them when necessary. Using various components as examples, his method can be outlined as follows:

1. With his *Monatliche Unterredungen* Tentzel produced the first critical journal in the German language that was very consciously committed to the broadly polyhistoric concept of the *Journal des Sçavans*. He thus adopted the conventionalised standards and particularly the critical concept of this still new medium, thereby appropriating the following norms of presentation and critical assessment: evaluation only of subject matter and not of individuals; objectivity; competence; thoroughness; straightforwardness in dealing with subject matter; and moderation in tone.[74] Like Thomasius, Tentzel by no means shrank from passing judgment. On the contrary, he expressed "public *censure* [criticism] of new books" (January 1690, 'Vorrede', 4) which was nonetheless "not *contradicendi studio* but

[74] Comments on these features can be found above all in the programmatic prefaces (see, e.g., January 1690, 3–6) and in disputes with critics.

ex amore veritatis" (December 1690, 'Anhang', 1136). He strove to express criticism that was not too harsh, but did not shy away from it when—in the interest of serving the truth—an inferior author deserved no better (see January 1696, 60).

2. His comprehensive knowledge of the journal market allowed Tentzel to combine different existing concepts—from Mencke's *Acta Eruditorum* to Happel's *Relationes Curiosae*—for a larger target public. By no means did this represent a retreat from the standards of university scholarship, however. Thus decidedly specialised texts, frequently containing extensive original quotations in foreign languages, were common. However—and here is where the element of popularisation came in—these texts were accompanied not only by explanations and additional anecdotes but also by translations or brief paraphrases of content when necessary. The subjects Tentzel dealt with thus remained in the realm of scholarship[75] but were treated in a way that made them easier to comprehend.[76] The principle of selective, focused presentation and discussion[77] that Tentzel repeatedly emphasised was also part of this format. He did not commit himself to addressing the overall context but focused on those items that were of "*curiosity*" (i.e. interesting novelties).

3. Tentzel's choice of subject matter shows that he was interested not only in current issues but also in new methods committed to empiricism.[78] Thus in addition to conventional themes he also showed a preference for findings from the fields of numismatics, palaeontology, geography, ethnology and the experimental natural sciences. These priority areas, which underscored Tentzel's "modernity", were supported by illustrations that were both appealing to the public and scientifically reliable.

4. Tentzel did not adopt a simple format of review following review, treatise following treatise and news following news, but arranged material according to subject areas or topical groups.[79] There was more to it than

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[75] This becomes unmistakably clear when Tentzel declares scholarly correspondence with experts as a *conditio sine qua non* not only for true scholarship but, naturally, for his journal as well.

[76] The above-mentioned aspect of carefully calculated entertainment belongs in this context as well; see above and note 59.

[77] The purpose of the discussion group, according to Tentzel, is to "actually examine [a particular work] and, where we find it appropriate, to take up this or that question or issue and give an opinion on it, and occasionally debate the *pros & cons*" (June 1689, 675).

[78] In assessing travel accounts, for instance, Tentzel resorts to "a new mode of description . . . as demanded by the *Royal Society* in England and all other *curious* and learned people" (January 1690, 66).

[79] Happel's *Relationes Curiosae* and the first year of Thomasius' *Monats-Gespräche* follow a similar procedure.

merely arranging things together, however; he included complementary information from additional sources too, skilfully using associative techniques.[80] This procedure of enhancing the material offered his readers both an overview and details. In the process, Tentzel also made use of the method of selection previously mentioned: only those aspects of a subject were taken up that were of interest in the context under consideration and thematically appropriate.

5. The decision to make critical assessments [*Judicium*] of new works led—as Tentzel was fully aware—less to appreciation and recognition than to dispute and enmity. But in the final analysis the scholarly feuds[81] arising from the interplay of criticism and counter-criticism made no small contribution to the journal's sales.[82] In this regard Tentzel's journals did not try to avoid controversial subjects but were instead dedicated to them with the intensity and duration deemed adequate.[83]

6. Finally, Tentzel and his publishers strove to be as up-to-date as possible. This meant not only reviewing new books as quickly as possible but also disseminating contemporary scholarly news and printing correspondence as soon as it was received. That the presentation of current news was seen as a guarantor of success can be deduced from a myriad of purposely interspersed textual information that underscored the immediacy of a report and the timeliness of an article.[84]

Despite the exceptional position that Tentzel's journals occupied in their time, they became increasingly less visible in the course of the eighteenth century. Their place was taken by contemporary learned journals that met the greater need for information in their own day and made Tentzel's journals appear to be diffusely associative and "outdated" by comparison. In the field of *Historia Litteraria* (scientific publications), however, the

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[80] Although the discussion format in the *Monatliche Unterredungen* provided especially favourable conditions for this, it was not imperative, as Tentzel showed in the *Curieuse Bibliothec*.

[81] On the techniques and methods of disputes in learned journals, see Habel 2007 (note 1), 250–295.

[82] This connection was forthrightly addressed by Thomasius in 1692 (note 34), 3.

[83] See, for instance, Tentzel's comment: "the freedom we take to pass judgment on others we must also grant to others . . . I say, for the most part. For I believe that there is no evil in replying more than once to one's opponent, above all if he criticises more things than previously" (December 1690, 'Anhang', 1137).

[84] This can be illustrated by a concrete example: Concerning a spectacular finding of bones "a report is given by an arriving *passenger* who *actually* saw those huge bones which were *recently* excavated at the town of Tonna" (April 1696, 297).

Monatliche Unterredungen and the *Curieuse Bibliothec* remained authoritative sources that were regularly consulted and quoted until the end of the Enlightenment. Tentzel's achievement was eclipsed only by rather negative and historically unbalanced assessments in the nineteenth and early twentieth centuries.[85]

Tentzel's contemporaries did not fail to acknowledge him or to recognise the pioneering role he played in the world of learned journals, despite some reservations about particulars. "Tentzel, by virtue of his *curieuse* journals, has become so well known to scholars that they are not likely to forget him,"[86] wrote one author of an anonymous journal article. He continued, "Now this is particularly true of the journal first published under the title *Monatl. Unterredungen* etc. and continued thereafter under the slightly altered name *Curieuse Bibliothec oder Fortsetzung der Monatlichen Unterredungen* etc."[87] Although this contemporary praise may seem somewhat ardent, it can be said still from our today's perspective that Tentzel recognised the possibilities of the new medium of the learned journal more readily, expanded them more energetically, and exploited them more skilfully than most of his direct competitors. Through his journals, which were groundbreaking in their day, Tentzel had a lasting influence and left an enduring mark on both scholarly and popular scientific communication in his time.

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[85] See especially Prutz 1845 (note 16), 344–347 and Joachim Kirchner, *Das deutsche Zeitschriftenwesen* (Leipzig 1942), vol. 1, 38f.

[86] This quotation is repeated verbatim in Zedler 1732–1754 (note 21), XLII: 903.

[87] Anonymous, 'Was halten die Gelehrten von Wilhelm Ernst Tentzels *Curieuser Bibliothec*?', *Der Unpartheyische Bibliothecarius* (1713, 8), 712–717: 715.

ALBRECHT VON HALLER'S CONTRIBUTION TO THE *GÖTTINGISCHE ANZEIGEN VON GELEHRTEN SACHEN*: THE ACCOUNTING RECORDS

Anne Saada

This article is designed as the second part of a study published in 2008 about Albrecht von Haller and the learned Göttingen journal, the *Göttingische Anzeigen von gelehrten Sachen* [GGA].[1] As that study showed, Haller's involvement in the *GGA* was immense:[2] until his death in 1777, he published about 9,000 reviews in the journal.[3] More narrowly, between 1771 and 1777, the years on which the study focuses,[4] half of the *GGA* was given over to him, in that he wrote 400 reviews out of a total of 800.[5] This dominance of the journal by Haller raises questions: What were the reasons why he produced so many reviews? Was this output the result of a request by the editors or was it Haller's choice? These questions lie at the heart of the first article. On the basis of a study of Haller's correspondence

[1] Anne Saada, 'Les relations entre Albrecht von Haller et la France observées à travers le journal savant de Göttingen', in Michèle Crogiez (ed.), *Les écrivains suisses alémaniques et la culture francophone du XVIII^e* (Genève 2008), 175–191.

[2] The connection between Albrecht von Haller and Göttingen went back to 1736, when he was appointed to the chair of anatomy, botany and surgery at the University of Göttingen (founded in 1734). From the very beginning Haller played a key role in the development of the university and the network of institutions connected with it: In 1747 he became editor of the *Göttingische Anzeigen von gelehrten Sachen*, and he was president of the Academy of Sciences (called the Society of Sciences in the eighteenth century) as of its establishment in 1751. In 1753 Haller left Göttingen for Bern. Despite his departure, his relationship with the University of Göttingen continued, in particular in the form of contributing reviews. See Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008); Norbert Elsner and Nicolaas A. Rupke (eds.), *Albrecht von Haller im Göttingen der Aufklärung* (Göttingen 2009).

[3] The *Göttingische Anzeigen von gelehrten Sachen* were first published in 1739 (appearing under the name of *Göttingische Zeitungen von gelehrten Sachen* until 1752) and still exist today. For Haller as reviewer, see Karl S. Guthke, *Haller und die Literatur* (Göttingen 1962); Hubert Steinke, *Irritating Experiments: Haller's Concept and the European Controversy on Irritability and Sensibility, 1750–90* (Amsterdam and New York 2005), 251–265; Claudia Profos Frick, *Gelehrte Kritik. Albrecht von Hallers literarisch-wissenschaftliche Rezensionen in den Göttingischen Gelehrten Anzeigen* (Basel 2009).

[4] The reason for this is that for this period we have correspondence between Albrecht von Haller and Christian Gottlob Heyne, who had been editor of the *Göttingische Anzeigen von gelehrten Sachen* since 1770: Frank William Peter Dougherty (ed.), *Christian Gottlob Heyne's Correspondence with Albrecht and Gottlieb Emanuel von Haller* (Göttingen 1997).

[5] In 1771, he wrote 434 reviews out of a total of 894; in 1774, 370 out of 719; and in 1777, 374 out of 733. See Saada 2008 (note 1), 177.

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with the journal's editor, Christian Gottlob Heyne,[6] a number of arguments were put forward to explain this phenomenon:[7]

a) The wish expressed by Haller to be the only contributor to review French works. Indeed, in 1771, of the 276 reviews of French works published in the journal, 264 were the work of his pen; similarly, in 1774, he wrote 178 of the 199 reviews devoted to French book production, and in 1777 134 out of a total of 179.
b) Haller had made the same demand regarding books on medicine and botany; although it was not possible to calculate the proportion of Haller's reviews dealing with works in these disciplines with the same precision as for books in French, it was nevertheless observed that the level of participation of physicians and botanists in the learned journal was very low throughout the years under study.[8]
c) Haller's concern to strengthen his authority within the Republic of Letters. To have access to a celebrated learned journal was to have the power to make one's voice heard. Even if the reviews in the *GGA* were anonymous, readers knew that Haller contributed to the journal and they attributed most of the reviews to him.
d) Reviewing was part of Albrecht von Haller's daily scholarly activity. He systematically wrote summaries of the works he read, whether or not they were published. The *GGA* provided him with a setting to make them public.[9]

A consultation of the *GGA* archives held in the Göttingen Academy of Sciences [Königliche Sozietät der Wissenschaften zu Göttingen] suggested

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[6] The philologist Christian Gottlob Heyne had been a professor at the university since 1763, and from 1770 onwards had combined this with the positions of director of the library, permanent secretary of the Academy of Sciences and editor of the learned journal.

[7] Saada 2008 (note 1).

[8] There were four main authors producing reviews of works on medicine during this period. But the number of their contributions was very small: Johann Andreas Murray, professor of medicine at the University of Göttingen since 1769, who published 32 reviews in 1771, 18 in 1774, and 20 in 1777; Rudolf Augustin Vogel, physician and member of the Göttingen Academy of Sciences as of 1770, who wrote one in 1771 and four the following year; Heinrich August Wrisberg, professor of medicine at the University of Göttingen and member of the Academy of Sciences from 1770 onwards, who produced two in 1771, two in 1774 and one in 1777; August Gottlieb Richter, professor of medicine at Göttingen since 1766 and member of the Academy of Sciences from 1776, who was the author of two reviews in 1771, two in 1774 and two in 1777. Cf. Oskar Fambach (ed.), *Die Mitarbeiter der Göttingischen gelehrten Anzeigen: 1769–1836* (Tübingen 1976), 18–64.

[9] See Hubert Steinke and Martin Stuber, 'Haller und die Gelehrtenrepublik', in Steinke, Boschung and Proß 2008 (note 2), 381–414.

a new argument, which lies at the heart of this second part: the financial aspect.[10] Indeed, the accounting records show that the reviews contained in the *GGA* were paid for by the learned journal. So Haller, since he published more than the others, received larger sums of money than they did. Should this motive be included among the reasons which prompted Haller to allocate himself half the journal? This is the hypothesis envisaged in this new study.

In connection with this question, this article examines how the learned journal was managed after Haller died: How was the allocation of reviews conducted after his death? Did the journal replace Haller with another "Haller"—in other words, did Haller fulfil a necessary role? Or was Haller an obstacle to a more collaborative management of the journal?

Haller's Remuneration

The *GGA* archives held by the Göttingen Academy of Sciences include substantial files on the financing of the journal.[11] For certain years these documents include the balance sheets as well as the list of bills covering the purchase of paper, shipping costs, payments for reviews, etc. Each annual balance sheet was preceded by a long preface in which the person responsible for the accounts—Heyne himself, the editor of the learned journal—explained his principles. A comparison of these different archives has made it possible to reconstruct the fee paid for a review. The rate for the *GGA* depended on the number of characters, as it does today. A section—or signature—of reviews (16 pages in octavo format) earned 4 Reichsthaler [rthlr.].[12] In theory, the journal was supposed to consist of 168 ordinary numbers each year (an ordinary number being half a signature) and 52 supplementary numbers (26 signatures).[13] Under the principles set down by the editors, the annual budget for reviews was fixed at 440 rthlr.[14] But in practice the journal often contained more signatures,

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[10] On the financial aspect, see Thomas Habel, *Gelehrte Journale und Zeitungen der Aufklärung. Zur Entstehung, Entwicklung und Erschliessung deutschsprachiger Rezensionszeitschriften des 18. Jahrhunderts* (Bremen 2007), 103–110.

[11] Akademie der Wissenschaften zu Göttingen, Etat 21 and Etat 22.

[12] Akademie der Wissenschaften zu Göttingen, Etat 22: 28a. *Rechnung über Einnahme und Ausgabe bey der Aufsicht über die Göttingischen gelehrten Anzeigen vom 1sten Jan. 1771 bis ult. Dez. 1771*, "avertissement", fol. vii. The Reichsthaler was one of the two units of account in the Empire. A Reichsthaler was divided into 24 Groschen, and each Groschen into 12 Pfennig (there were thus 288 Pfennig in one Reichsthaler).

[13] Akademie der Wissenschaften zu Göttingen, Etat 22: 28a (note 12), fol. ii f.

[14] Ibid., fol. vi–vii.

and the sum spent on reviews could consequently be higher. In 1771, for example, it was as much as 546 rthlr.[15] To put this sum into context, let us compare it with other budget items in the learned journal (see tab. 1).

Table 1.[16] Account of income and expenditure Jan. 1771–31 Dec. 1771 (in rthlr.)[17]

Summary of total expenditure and income			
	Rthlr.	Gr.	Pf.
Paper	371	20	
Printer's salary	293		
Collation of signatures	54	13	4
Fees for reviews (Jan.–Jun.)	286	16	10
Fees for reviews (Jul.–Dec.)	260	21	8
Postage for letters and correspondence	15	3	3
Miscellaneous expenditure	63	16	4
Total	1345	19	5
Comparison of income and expenditure			
Income	1,378	6	4
Expenditure	1,345	19	5
Surplus	32	10	11

The budget set aside for reviews was therefore higher than the journal's other budget items. In 1771, it amounted to 40 per cent of the journal's expenditure.[18] How was this sum distributed among the reviewers writing for the *GGA*? To answer this question, a series of investigations were made into the accounting records of the learned journal for the years 1771, 1772, 1777, 1778 and 1783. The choice of these dates is to be explained on the one hand by the fact that the accounts have only been preserved for those particular years, and on the other, that we wanted to see whether Haller's death in 1777 had led to changes in the management of how the reviews were distributed among the reviewers.

[15] Ibid., fol. 12.

[16] The numbers in this table—as in all subsequent ones—have been copied in full from the archives. They are not the result of calculations made by the writer of this article. Some of the totals are slightly wrong, but most are correct, and in any case the relative amounts, which are what interests us here, are barely affected by inaccuracies of detail.

[17] Akademie der Wissenschaften zu Göttingen, Etat 22: 28a (note 12), fol. 12f.

[18] In percentage terms, Haller's remuneration amounted to 15 per cent of the total expenditure of the learned journal.

The table below (tab. 2) allows us to see the sums paid to writers for their contributions to the journal in 1771.

Table 2.[19] Fees for reviews including sub-editing and the compilation of indexes (in rthlr.)
1 Jan. 1771–31 Dec. 1771[20]

	1 Jan.–30 Jun.			1 Jul.–31 Dec.		
Name of reviewer[21]	Rthlr.	Gr.	Pf.	Rthlr.	Gr.	Pf.
Heyne for his work as editor[22]	50					
Haller	93	9	8	102	4	
Beckmann	1	2	10	3	9	
Feder	9	2	2	12	3	4
Gatterer	1	1	4	2	20	8
Heyne	27	10	4	24	22	6
Hofacker	4	5	4	12	5	4
Kästner	14	18	8	15	11	4
Less	7	13		11		8
Meister	1	13	4			
Michaelis	3	5	10	1	16	6
Murray, J.P.	4	19	2	3	14	8
Murray, J.A.	14	17	2	5	8	
Pütter	1	15	2			
Schlözer	6	18	4	3	12	10
von Selchow	2	2	6		17	8
Vogel		16	8			
Walch	14	6	10	12	8	2
Richter				1	8	8
Wrisberg		19			18	
Reviews, index and sub-editing by Erxleben	9	11	6	47	8	4
Reviews and sub-editing by Stromeyer	18					
Total (in rthlr.)[23]	286	16	10	260	21	8

[19] See note 16.

[20] Akademie der Wissenschaften zu Göttingen, Etat 22: 28a (note 12), fol. 6f.

[21] They all belonged to the teaching staff of the University of Göttingen, apart from Haller.

[22] The fee for editing the learned journal was set at 50 rthlr. per year, while sub-editing was paid 39 rthlr. (payment for sub-editing one signature was 8 Groschen). As for the compilation of indexes, this brought in 28 rthlr. See Akademie der Wissenschaften zu Göttingen, Etat 22: 28a (note 12), fol. vi f.

[23] See note 16.

The individuals whose names appear in this table were all members of the teaching staff at Göttingen except for Haller, who had left the university in 1753.[24] The figures show that in 1771 Haller alone accounted for nearly 36 per cent of the budget allocated for reviews, namely 195 rthlr. and 13 gr. This sum corresponded to the production of 1,100,100 characters and 782 pages. In second position, far behind him, came Heyne who in 1771 was paid 52 rthlr. and 8 gr. (for 209 pages), about a quarter of what Haller earned. The 19 other reviewers shared the rest of the money between them. It should be noted here that the bulk of the postage costs was down to Haller: they covered the dispatch of books from Göttingen to Bern, and also the dispatch of Haller's reviews from Bern to Göttingen.

To put into context the sum earned by Haller in 1771, it is necessary to have some points of comparison: the annual salary paid to Haller by the University of Göttingen until he left in 1753 amounted to 600 rthlr.[25] This was a relatively high salary. In the same period, Georg Gottlob Richter, who was also full professor of medicine, was the only person to receive 800 rthlr.[26] By contrast, the pay of their colleague Johann Andreas Murray, who had been full professor of medicine since 1769, was only 400 rthlr.[27] These figures show that the sum paid to Haller for his contributions to the learned journal was by no means merely symbolic: he received half the annual salary of his colleague Murray and a quarter of Richter's. It can thus be said that the financial aspect was among the reasons which prompted Haller—and the other reviewers—to publish reviews in the learned journal of Göttingen.

As far as the distribution of the budget is concerned, there is nothing exceptional about the year 1771, as can be seen from the fees received by Haller and his colleagues in 1772 (tab. 3):

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[24] See note 2.

[25] See Birgit Panke-Kochinke, *Göttinger Professorenfamilie: Strukturmerkmale weiblichen Lebenszusammenhangs im 18. und 19. Jahrhundert* (Pfaffenweiler 1993), 32; Ulrich Joost, '"Trübselige kleine Stadt in einem trübseligen Land"? Hallers Göttingen', in Elsner and Rupke (note 2), 71–105: 101–104.

[26] Panke-Kochinke 1993 (note 25), 32.

[27] Ibid.

Table 3.[28] Fees for reviews including sub-editing and the compilation of indexes (in rthlr.)
1 Jan. 1772–31 Dec. 1772 (in rthlr.)[29]

	1 Jan.–30 Jun.			1 Jul.–31 Dec.		
Name of reviewer[30]	Rthlr.	Gr.	Pf.	Rthlr.	Gr.	Pf.
Haller	105		10	105	4	10
Heyne (for his work as editor)	50					
Kästner	12	19	10	17	22	
Walch	10	4	8	9	11	
Heyne	17	9	4	40	20	2
Murray, J.P.	3			3	7	8
Murray, J.A.	1	10	8	7	10	10
Less	9	12	2	9	21	
Feder	8		2	6	23	10
von Selchow	1	21	6			
Schlözer	1	7		5		10
Hofacker	18	5	2	1	19	10
Michaelis	4	9	6	2	3	
Vogel	1	9	4	1	1	10
Beckmann	2	13	2	1	15	
Meister	1	20	2			
Richter	2	13	8		8	
Wrisberg	1			1	19	
Pütter		19	4			
Erxleben	29	11	2	47	8	8
Total (in rthlr.)	282	19	8	262	5	6

As we can see, in 1772 Haller was still in the top position with a remuneration of 210 rthlr., followed this time by physics professor Johann Christoph Erxleben, who was paid 76 rthlr. and 19 gr., and then by Heyne, with 58 rthlr. and 5 gr. If we place these figures into the context of the journal's total budget, we get the following picture (tab. 4):

[28] See note 16.

[29] Akademie der Wissenschaften zu Göttingen, Etat 22: 31a. *Rechnung über Einnahme und Ausgabe bey der Aufsicht über die Göttingischen gelehrten Anzeigen vom 1sten Jan. 1772 bis ult. Dez. 1772 geführt von H. Gottl. Heyne*, fol. 7–10.

[30] They all belonged to the teaching staff of the University of Göttingen, apart from Haller.

Table 4.[31] Account of income and expenditure Jan. 1772–31 Dec. 1772 (in rthlr.)[32]

Summary of total expenditure and income			
	Rthlr.	Gr.	Pf.
Paper	273	12	
Printer's salary	466	16	8
Collation of signatures	56		
Fees for reviews (Jan.–Jun.)	282	19	8
Fees for reviews (Jul.–Dec.)	262	5	6
Postage for letters and correspondence	13	21	7
Miscellaneous expenditure	104	2	1
Total	1459	5	6
Comparison of income and expenditure			
Income	1,482	10	11
Expenditure	1,459	5	6
Surplus	23	55	

The sum paid out for reviews therefore remained the journal's primary expense: 545 rthlr., or 37 per cent of the global budget. Haller alone received 39 per cent of the budget for reviews, or, to put it differently, the fee he was paid for his work as a reviewer amounted to 14 per cent of the journal's outlay. It will be noticed that the costs incurred in the year 1772 for the printer's salary, paper, etc. are higher than in 1771. The reason is that the print run of the journal had increased: it had risen to 1,000 copies in 1772.[33]

The accounts of the years 1773–1776 have unfortunately not survived. For the year 1777, however, the following data is available:

[31] See note 16.
[32] Akademie der Wissenschaften zu Göttingen, Etat 22: 31a (note 29), fol. 16f.
[33] Ibid., fol. 5f.

Table 5.[34] Fees for reviews including sub-editing and the compilation of indexes
1 Jan.–31 Dec. 1777 (in rthlr.)[35]

	1 Jan.–30 Jun.			1 Jul.–31 Dec.		
Name of reviewer[36]	Rthlr.	Gr.	Pf.	Rthlr.	Gr.	Pf.
Haller*	125	13	12	121	22	2
Gebhardi*	19	14		16	13	4
Heyne	16	10		35	9	
Walch	13	25	6	5	23	
Feder	12	23		8	30	
Kästner	10	13	4	14	30	2
Koppe	10	13		4	1	6
Less	6	31	4	5	23	
Candidate Abele*[37]	4	35	6	5	20	
Magister Volborth[38]	4			4		
Beckmann	3	17	2	1	7	6
Murray	3	3	4	4	32	6
Meiners	3	18	4	13	3	2
Michaelis	1	8				
Lichtenberg	1	9				
Wrisberg		30	4			
Richter		27	2			
Erxleben		23	4	1	5	
Pastor Mutzenbecher*					23	2
Candidate Meurer*[39]				8	35	4
Böhmer				1	13	2
Total (in rthlr.)	238	29	2	238	1	10

[34] See note 16.

[35] Akademie der Wissenschaften zu Göttingen, Etat 22: 45a. *Rechnung über Einnahme und Ausgabe bey der Aufsicht über die Göttingischen gelehrten Anzeigen vom 1sten Jan. 1777 bis ult. Dez. 1777 geführt von H. Gottl. Heyne*, fol. 9f.

[36] They all belonged to the teaching staff of the University of Göttingen, except for those whose names are followed by an asterisk. Only biographical details of the students are provided in the following footnotes. Details of the professors are given in the body of the text.

[37] Johann Martin von Abele was a doctoral law student at Göttingen. Fambach 1976 (note 8), 420.

[38] Johann Carl Volborth was a doctoral theology student at Göttingen. Ibid., 513.

[39] Heinrich Meurer was a doctoral law student at Göttingen. Ibid., 482.

Table 6.[40] Account of income and expenditure 1 Jan. 1777–Dec. 1777 (in Louis d'or)[41]

Summary of total expenditure and income			
Paper	429	2	3
Printer's salary	499	14	
Collation of signatures	214 (200 rthlr.)	6	10
Fees for reviews (Jan.–Jun.)	255 (238 rthlr.)	20 (29 gr.)	10 (2 pf.)
Fees for reviews (Jul.–Dec.)	271 (253 rthlr.)	5 (5 gr.)	8 (4 pf.)
Fees for sub-editing	82 (76 rthlr.)	(19 gr.)	4 (4 pf.)
Postage for letters and correspondence	13 (12 rthlr.)	16 (18 gr.)	7 (8 pf.)
Miscellaneous expenditure	43	11	2
Total expenditure	1,809	5	8
Comparison of income and expenditure			
Income	1,840	18	5
Expenditure	1,809	5	8
Surplus	31	12	9

Haller's position is still dominant: he alone takes 47 per cent of budget allocated to reviews, or 13.5 per cent of the journal's global budget (see tab. 6). In second place, far behind, comes Heyne, with a total of 51 rthlr. and 19 gr.

Until 1777, the pattern of expenditure thus remained the same: the largest proportion of the journal's budget was allocated for reviews. The other major items of expenditure were divided between the purchase of paper, the salary of the printer, the work of collating the signatures, and postage for letters. Haller was still the reviewer submitting the greatest number of reviews—going as far as to take up half the pages in the learned journal—and in consequence was the one receiving the largest amount in fees. But what happened once he had died? What decisions did the editor of the

[40] See note 16.

[41] Akademie der Wissenschaften zu Göttingen, Etat 22: 45a (note 35), fol. 17–18. This table is shown in the currency actually in use, the Louis d'or. Since the move from one currency to the other in Göttingen's accounts is neither evident nor explicit here, it is not currently possible to provide a coherent explanation for it. However, in as far as for some items of expenditure the sums are given in both Louis d'or and Reichsthaler, these figures are added here in brackets, to give the reader some idea of the relationship between the two currencies.

journal take about its management? Was the choice between cutting the number of reviews, recruiting a new "Haller", or perhaps sharing out the reviews differently among the team of reviewers? In other words, did Haller's death lead to a radical change in the administration of the *GGA*?

The Evolution of the Journal after 1777: Towards a Diversification of the Team of Reviewers

The death of Haller at the end of 1777 led to changes in the journal's organisation. There was no decrease in the number of reviews it produced. However, the group of reviewers associated with the journal gradually widened. The accounting records preserved for the years 1778 and 1783 make it possible to analyse the changes that took place over that period (tab. 7 and 8):

Table 7.[42] Fees for reviews including sub-editing and the compilation of indexes
1 Jan. 1778–31 Dec. 1778 (in rthlr.)[43]

	1 Jan.–30 Jun.			1 Jul.–31 Dec.		
Name of reviewer[44]	Rthlr.	Gr.	Pf.	Rthlr.	Gr.	Pf.
Haller*	81	12		66	4	
Kästner	14	8	4	23	14	6
Walch	14	22		11	15	6
Meister	1	35	2	2	16	6
Wrisberg	3	16		1		
Murray				11	3	
Richter	3	33	2	2	33	
Beckmann	6	17		6	6	6
Lichtenberg		28	6		27	4
Meiners	9	5	6	7	31	6
Feder	10	27	4	9	22	
Less	7	22		6	24	
Koppe	4	26		7	20	4
Gmelin	10	25		19	30	
Michaelis					13	2

[42] See note 16.

[43] Akademie der Wissenschaften zu Göttingen, Etat 22: 45a. *Rechnung über Einnahme und Ausgabe bey der Aufsicht über die Göttingischen gelehrten Anzeigen vom 1sten Jan. 1778 bis ult. Dez. 1778 geführt von H. Gottl. Heyne*, fol. 7f.

[44] See note 36.

Table 7 (*cont.*)

	1 Jan.–30 Jun.			1 Jul.–31 Dec.		
Name of reviewer	Rthlr.	Gr.	Pf.	Rthlr.	Gr.	Pf.
Sprengel	6	24	6	7	9	6
Stromeyer				2	23	6
Dr. Abele	2	11		2	32	
Dr. Meurer				1	18	6
Magist. Dietrichs*[45]	1	27	4	2	5	4
Dr. Weiss	3	9		1	10	
Gebhardi*	15	33	4	12	24	2
Dr. Lentin*	2	10	6	2	31	2
Marcard*	14	25		4	27	2
Pastor Mutzenbecher*		33	4			
Heyne	29	23	4	43	6	
Volborth	4					
Total (rthlr.)	250	10	6	258	19	4

Table 8.[46] Fees for reviews including sub-editing and the compilation of indexes (in rthlr.)
1 Jan. 1783–31 Dec. 1783[47]

	1 Jan.–30 Jun.			1 Jul.–31 Dec.		
Name of reviewer[48]	Rthlr.	Gr.	Pf.	Rthlr.	Gr.	Pf.
Kästner	28	18	10	26	3	10
Walch	11	17	6	10	18	10
Meister	7	18	10	2	23	6
Murray	15	6		14	23	
Beckmann	6	9	8	7	19	2
Lichtenberg		18	10	1	5	6
Meiners	2	20		4	18	4
Gmelin	31	10		20	6	
Less	9	18	10	10	9	10
Feder	14	7	6	13	4	4
Koppe	1	1		5	2	6

[45] Johann Christian Wilhelm Dieterichs was at the time a student at Göttingen. Fambach 1976 (note 8), 432.

[46] See note 16.

[47] Akademie der Wissenschaften zu Göttingen, Etat 22: 58a. *Rechnung über Einnahme und Ausgabe bey der Aufsicht über die Göttingischen gelehrten Anzeigen vom 1sten Jan. 1783 bis ult. Dez. 1783 geführt von H. Gottl. Heyne*, fol. 5–7.

[48] See note 36.

Table 8 (cont.)

	1 Jan.–30 Jun.			1 Jul.–31 Dec.		
Name of reviewer	Rthlr.	Gr.	Pf.	Rthlr.	Gr.	Pf.
Spittler	3	11	6	4	17	4
Hißmann	14	13	6	25	9	6
Candidate Brandes[49]	7	18	8	4	11	10
Blumenbach	1	5				
Heyne	25	10		57	16	10
Volborth*	3	18	4	3	20	10
Gebhardi*	10	15	6	11	14	4
Lentin*	10		10	5	4	6
Forster	13	12		7	13	6
Sömmering*	8	21	6	1	23	8
Prof. Sprengel*	6	12	4	4	15	8
Schulz*	8	20	2	6	17	8
Eichhorn*	2	18	6	4	14	2
Prof. Haussmann*	1	16	2		6	
Gatterer					19	2
Wrisberg					8	
Richter					10	8
Osterley					16	10
Total (in rthlr.)	249	14		259	1	4

Several remarks are called for. Firstly, even though he was dead, Haller ironically remained in first position in 1778 for the number of reviews contributed and the fees received (with a total of 147 rthlr. and 16 gr.). He had in fact written so many reviews that his articles continued to fill the columns of the *Göttingische Anzeigen von gelehrten Sachen* until 1779. Secondly, and this is quite clear, from 1778 onwards, books were distributed differently within the learned journal. While formerly Haller would take half the reviews for himself, the works were now shared out more equitably among the reviewers. Thus, professors of medicine who had been working for the *GGA* for many years started to produce more reviews: Murray, who had reviewed only 19 works in 1772 and 29 in 1777, wrote 33 reviews in 1778 and 46 in 1783;[50] Richter, whose output had not exceeded

[49] Johann Friedrich Brandes was at the time a student at Göttingen. Fambach 1976 (note 8), 429.

[50] Ibid., 486.

five reviews a year, contributed 12 in 1778.[51] Thirdly, the number of reviewers increased in comparison with the preceding years (see tab. 7). Whereas until 1777 the circle of authors consisted of between 20 and 22 people and its composition remained stable, it now grew to 30 people in 1778 and 35 in 1783 (see tab. 8). Who were these newcomers? What criteria were used in recruiting them? What were their common denominators?

To answer these questions, we conducted a sociological analysis of the "newcomers". The criterion which appeared to be decisive in establishing a profile was whether (or not) they belonged to the University of Göttingen, rather than the discipline they belonged to. Whereas before Haller's death most of the reviewers had been members of the University of Göttingen, from 1778 onwards we witness the sudden appearance of a whole group of contributors from outside.[52] The point which those belonging to the University of Göttingen share with those from other institutions is the preponderance of professors of medicine. This characteristic can easily be explained: Given that Haller's reviews covered primarily the area of medicine, it is not surprising that the first priority was to reorganise the allocation of works on medicine within the learned journal.

The first group has two characteristics: it is made up entirely of physicians who had done all their studies at the University of Göttingen, with only one exception. This was Johann Friedrich Gmelin[53] who had trained at the University of Tübingen and who was appointed professor of medicine at Göttingen in 1778 (42 reviews in 1778 and 94 in 1783).[54] The three others were pure products of Göttingen: Johann Friedrich Stromeyer, who had been the official physician of the town of Göttingen and associated professor at the university since 1776 (20 reviews between 1778 and 1781);[55] Friedrich Wilhelm Weiss, who became a private lecturer [Privat-Dozent] at the University of Göttingen in 1778 (26 reviews between 1778 and 1782);[56] and Johann Friedrich Blumenbach, appointed professor of medicine at

[51] His contribution to the journal had never been very great, even though he had become a member of the Academy of Sciences in 1776. Fambach 1976 (note 8), 495. On the other hand, in the case of Wrisberg, there is no perceptible difference.

[52] Only those whose names appear in 1778 and 1783 have been taken into account.

[53] *Allgemeine Deutsche Biographie* (Leipzig 1875–1912), 56 vols., IX: 270.

[54] Fambach 1976 (note 8), 441f.

[55] Ibid., 508.

[56] Ibid., 515.

Göttingen in 1778[57] (two reviews in 1779 and five in 1783).[58] The composition of this first group—all of them physicians—thus suggests that before 1778, the presence of Haller not only prevented medical works from being reviewed by anyone but himself, but also impeded the recruitment of professors of medicine to the university; the arrival of Blumenbach and Gmelin so soon after his death points to this.

The structure of the second group, which is larger and consists of scholars from outside the University of Göttingen, is more complex. This group was divided into two parts as well, one consisting of the reviewers working in the area of medicine and the other of those in the fields of philosophy or theology. What the members of this second group of have in common is that they had all studied in Göttingen, with one exception. We thus find the same characteristic as above.

Taking the physicians first, the names of two of them appear in the register of the *GGA* as of 1778. One was Heinrich Matthias Marcard, who had been garrison physician in Hanover since 1774[59] and who also worked during the summer months in Bad Pyrmont. This was a spa popular with professors from Göttingen (Pütter for example) and especially with the upper aristocracy. It can therefore be assumed that Marcard had an extensive network of acquaintances, which seems to be confirmed by the fact that he was made a corresponding member of the Academy of Sciences of Göttingen in 1780[60] (14 reviews in 1778 and a total of 57 up until 1783). The other was Lebrecht Lentin, who was physician at the mines of Clausthal and who published a number of medical works in Göttingen. In 1778, Heyne entrusted him with reviewing writings about practical medicine. Lentin thus took responsibility for most of the medical writing in the *GGA* from 1778 to 1794 (100 reviews between 1778 and 1783). On reading his biography, one learns that his contributions helped him considerably to improve his financial situation.[61] In 1784, he officially became a corresponding member of the Academy of Sciences.[62] The name of Samuel Thomas

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[57] Blumenbach had started studying medicine in Jena, and had then come to Göttingen where he obtained the title of doctor in 1775. *Allgemeine Deutsche Biographie* 1875–1912 (note 53), II: 748.

[58] Fambach 1976 (note 8), 425. Gmelin had become a member of the Academy of Sciences in 1778 and Blumenbach in 1784.

[59] He had studied medicine in Göttingen between 1769 and 1771.

[60] *Allgemeine Deutsche Biographie* 1875–1912 (note 53), XX: 294; Fambach 1976 (note 8), 477.

[61] *Allgemeine Deutsche Biographie* 1875–1912 (note 53), XVIII: 262f.

[62] *Deutsches biographisches Archiv I* (München 1989), fiche 753: 780f.

von Sömmering appears in the *GGA* register from 1780 onwards. One year earlier he had obtained a post as professor of anatomy at the Collegium Carolinum in Kassel. Within the *GGA* he was responsible for the reviews of works on anatomy (77 reviews between 1780 and 1783).[63] Finally, from 1781 onwards, there is the name of Johann Stefan Haussmann, who was professor of anatomy and surgery in Brunswick (12 reviews between 1781 and 1783).[64]

As for those members from outside the university who were not physicians, the first to appear chronologically was Ludwig Albrecht Gebhardi, who had collaborated with the journal since 1774 (280 reviews between 1778 and 1783).[65] He had started his studies at the Knights' Academy in Lüneburg and had continued them at Göttingen to become the third teacher at the Knights' Academy in Lüneburg in 1765.[66] The next was Esdras Heinrich Mutzenbecher, whose name appears in the *GGA* register as of 1776 (nine reviews between 1776 and 1781)[67] and who was at that time pastor at the Lutheran church in The Hague (then from 1780 onwards in Amsterdam). Between 1773 and 1775 he had been second chaplain at the University of Göttingen and a member of the "Royal German Society" of Göttingen [Königliche deutsche Gesellschaft].[68] The name of Matthias Christian Sprengel first appears in the *GGA* in 1778 (104 reviews until 1783);[69] that same year, Sprengel had given his first seminars in history at the University of Göttingen, and one year later he became full professor of history and chief librarian at the University of Halle.[70] Johann Christoph Friedrich Schulz made his entry in 1779 (63 reviews up to 1783);[71] he had

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[63] *Allgemeine Deutsche Biographie* 1875–1912 (note 53), XXXIV: 610f.; Fambach 1976 (note 8), 503. He trained mainly under Blumenbach and Wrisberg.

[64] He had received the title of doctor of medicine from the University of Göttingen in 1778. Ibid., 451.

[65] Ibid., 440.

[66] *Allgemeine Deutsche Biographie* 1875–1912 (note 53), VIII: 483f. The archives held at the Academy of Sciences show that he conducted a sustained correspondence with Heyne.

[67] Fambach 1976 (note 8), 487.

[68] *Allgemeine Deutsche Biographie* 1875–1912 (note 53), XXIII: 119. Throughout his life he conducted a correspondence with such scholars at Göttingen as Heyne, Michaelis and Walch.

[69] Fambach 1976 (note 8), 487 and 506f.

[70] Sprengel contributed to several works by Schlözer (under whom he had studied), and also by Johann Reinhold Forster, the father of Georg Forster, who was a professor at Halle. *Allgemeine Deutsche Biographie* 1875–1912 (note 53), XXXV: 299.

[71] Fambach 1976 (note 8), 501. He had studied theology at Göttingen, in particular with Michaelis.

held a post of professor of Greek and oriental literature at the University of Giessen since 1771 (and in 1783 became professor of theology there). The name of Johann Gottfried Eichhorn appears as of 1781; he was professor of oriental languages at the University of Jena (nine reviews until 1783).[72] A few years later, in 1788, he was appointed professor of philosophy at Göttingen.[73] The only person who had not studied at Göttingen was the naturalist and ethnologist Georg Forster, who had been resident in Kassel since 1779, where he taught natural history at the Collegium Carolinum.[74] But Forster maintained close links with Göttingen: he went often from Kassel to Göttingen, where in 1780 he took part in the establishment of Lichtenberg's journal, the *Göttingisches Magazin*. Once he was thus introduced into the network, Heyne gave him the task of reviewing travel literature in the *GGA* from 1781 onwards (25 reviews between 1781 and 1783).[75] These intellectual connections went hand in hand with private ones: in 1784 Forster became engaged to Heyne's daughter, Therese Heyne, whom he married a year later.[76] Indeed, several of the writers mentioned above already had connections with each other before they were brought into the journal's editorial team: this was the case, for example, with Forster and Sömmering, who were close friends; Forster and Sprengel, who were brothers-in-law; Sömmering and Blumenbach, where the former had been the pupil of the latter before a friendship developed between them; and others.

The conclusion to be drawn from these two groups is this: the reviewers who joined the *GGA* editorial team after Haller's death had all studied at Göttingen, with two exceptions, Gmelin and Forster. On this point, it should be specified that Gmelin was already famous before 1778, as was Forster, who together with his father had taken part in the voyage of Captain Cook. This initial analysis suggests that recruitment of reviewers by the *GGA* was basically an internal process. It must be said, however, that the sample on which this study is based is too small to draw any firm conclusions. Nevertheless, its characteristics invite two comments about the changes that Haller's death brought about in the administration of the learned journal. First of all, we can note a geographical diversification

[72] Ibid., 433.
[73] He had followed the courses of Michaelis, Walch, Schlözer and Heyne at Göttingen.
[74] He was an old friend of Sömmering, whom he had in fact recommended for the post of professor of anatomy at Kassel.
[75] Fambach 1976 (note 8), 439.
[76] *Allgemeine Deutsche Biographie* 1875–1912 (note 53), VII: 175ff.

in the team of reviewers: the journal no longer drew only on "locals", in other words, on members of the University of Göttingen. In fact, Haller was replaced by a group of new entrants who were pursuing careers in the Electorate of Hanover (garrison physician in Hanover, mine physician in Clausthal, professor at the Collegium Carolinum in Kassel, professor in Brunswick, third teacher at the Lüneburg Knights' Academy) or in neighbouring territories and countries (professor at the University of Halle in Brandenburg, professor at the University of Giessen in Hesse-Darmstadt, professor at the University of Jena in Saxe-Weimar, pastor in The Hague in the Netherlands). This distribution over a wide area reflects the geographical dispersion of former Göttingen students who had by then embarked on their careers. Secondly, we can note an effort to recruit specialists in specific subjects. This observation is true for the physicians, who were mainly "concrete" practitioners in particular areas, and no longer generalists. To be positive about this, it would be necessary to consult the books they reviewed to be able to identify the genre to which these belonged.[77]

These two remarks should, for the moment, be regarded as hypotheses. They suggest that this work should be continued with a systematic study of the way the composition of the team of reviewers associated with the *GGA* evolved over a period of several years, and with further research in the archives of the learned journal. This will make it possible to reconstruct the functioning of the *Göttingische Anzeigen von gelehrten Sachen* after 1777, a topic that could become the subject of a third part of this study.

Conclusion

At the outset of this research project the intention was only to study the earnings accruing to Haller from his contributions to the *GGA*. The importance of the financial aspect of Haller's involvement with the *GGA* has indeed been revealed: thanks to the number of his reviews, he earned about half an extra annual salary. But examination of the sources gradually broadened out the topic: the study of the profits made by Haller was supplemented by a study of the management of the learned journal after

[77] We may also note that the level of involvement of reviewers in the journal was not determined by whether they were a professor at the university or a member of the Academy. Thus Richter, who was a professor and a member of the Academy, wrote very few reviews in comparison with Sprengel, for example.

Haller's death in 1777. The direction taken by the journal as of 1778, such as the widening of the circle of reviewers and its move away from territorial confines, has shown that Haller's presence had held up a certain number of developments. In this sense one can speak of an abrupt change in the direction of the *GGA* from 1778 onwards. This abrupt change is similar to another which had occurred a few years earlier in the administration of the university (founded in 1734) for a similar reason: the death in 1770 of the founder and first curator of the university, Gerlach Adolph von Münchhausen, had been followed by changes which directly affected the administration of the institution.[78] We may thus conclude by formulating the following hypothesis: Around the 1770s, Göttingen's academic network was in its second generation. The type of management set up by its founders, including Münchhausen and Haller, was no longer regarded as suitable by the new administration—including Heyne—who worked to change the system.

[78] The disappearance of decrees [Reskripte] laying down the rules of the university after Münchhausen's death are one indication of this. In order to ensure the smooth running of Göttingen's academic network—made up of the university, the learned journal, the library and the Academy—every week from 1736 to 1770 Münchhausen would draw up decrees aimed at improving the organisation of each of the institutions and of the system as a whole (Göttinger Universitätsarchiv, *Kopialbücher*). These decrees had legal force and they supplemented the university statutes promulgated in 1736. These edicts, collected in some 50 volumes of more than 500 pages each, stopped with the death of Münchhausen, an obvious indication of a change in the way the network was administered. I am currently studying this pivotal moment, the passage from one type of administration to another, and the results will be described later.

SAMUEL ENGELS'S *BIBLIOTHECA SELECTISSIMA* (1743). "RARITY" AS A CRITERION OF KNOWLEDGE AND ITS CLASSIFICATION

Torsten Sander

> Bern. In the preceding year a remarkable inventory of rare books was printed here in octavo, with the title *Bibliotheca selectissima sive Catalogus librorum rarissimorum, quos nunc venum exponit Samuel Engel, Reip.*[*ublica*]. *Bernensis Bibliothecarius primarius*. . . . The owner acquired these books gradually, at great cost, and wishes now to dispose of them either all together or, in the event no buyer is forthcoming, to sell them at auction in Holland.[1]

This advertisement, which appeared in the *Göttingische Zeitungen von Gelehrten Sachen* in February 1744, marked the sad high-point of an intense passion. Within the space of a few years, Samuel Engel of Bern (1702–1784) had succeeded in amassing a collection of more than 1,000 volumes of rare books printed between the fifteenth and seventeenth centuries, including 116 incunables as well as significant collections of works by Giordano Bruno, Bernardino Ochino, Pietro Pomponazzi, Robert Fludd, and Ulrich Zwingli.[2] Engel, who had been head librarian at the city library of Bern since 1736, had gone to considerable trouble to purchase these books from throughout Europe, paying for them from his own pocket, originally with the expectation that the city council would take them over and make them part of the city library.[3] But the city was only prepared to purchase a few titles; consequently, Engel was left with the great majority of the books.

As a result of increasing financial difficulties, Engel was finally forced to sell the books elsewhere, preferably at auction in Holland or Leipzig. For this purpose he began to draw up an auction catalogue towards the end of 1742; although the manuscript was ready in June of 1743, the catalogue only appeared in print in January of 1744 owing to difficulties with the Faetscherin publishing house. Engel's cousin, Albrecht von Haller—who

[1] *Göttingische Zeitungen von Gelehrten Sachen* 14 (1744), 132–134: 133.

[2] For details on the contents of the collection, see Hans Bloesch, *Samuel Engel. Ein Berner Bibliophiler des 18. Jahrhunderts* (Bern 1925), 49–66.

[3] On Engel as a collector and on his collections, etc., see ibid., 30 und 32. Concerning the sale of the *Bibliotheca selectissima* and its takeover by Heinrich Count of Bünau, see ibid., 37–48.

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Fig. 1. Samuel Engel (1702–1784), Oil on cardboard, unknown artist (around 1760). Historisches Museum Bern, Inv. 50531.

also composed the advertisement quoted above—took responsibility for publicising the book inventory entitled *Bibliotheca selectissima sive Catalogus Librorum in omni genere Scientiarum rarissimorum*.[4]

As a result of this publication, Engel received an offer in April of 1744 from Heinrich Count of Bünau, who was interested in purchasing 800 selected works ahead of the planned auction. Bünau himself possessed a substantial library that is now considered the "most outstanding of all scholarly private libraries of the 18th Century". The seven-volume catalogue of the books in this library set a standard for classification of library holdings.[5] Engel declined this offer, however, as he did not want to see the total value of his collection depreciate. Instead, he continued his intensive preparations for an auction, which was to take place in Leipzig if possible. By June of 1744, 647 catalogues had already been sent out. Engel had procured general commission agents in 16 European cities who were to be responsible for transmitting offers from abroad.[6] Meanwhile, the books to be auctioned had been packed in boxes and barrels and sent to Frankfurt am Main, from where they were to be transported further to the Saxon trade fair city.[7] There, however, the planned auction process suddenly ran into difficulties, with the result that Haller advised against the entire undertaking. Samuel Engel, however, needed to sell his books as rapidly as possible; consequently, he entered into negotiations with Count Bünau in August of 1744. The two men met in Frankfurt am Main, where

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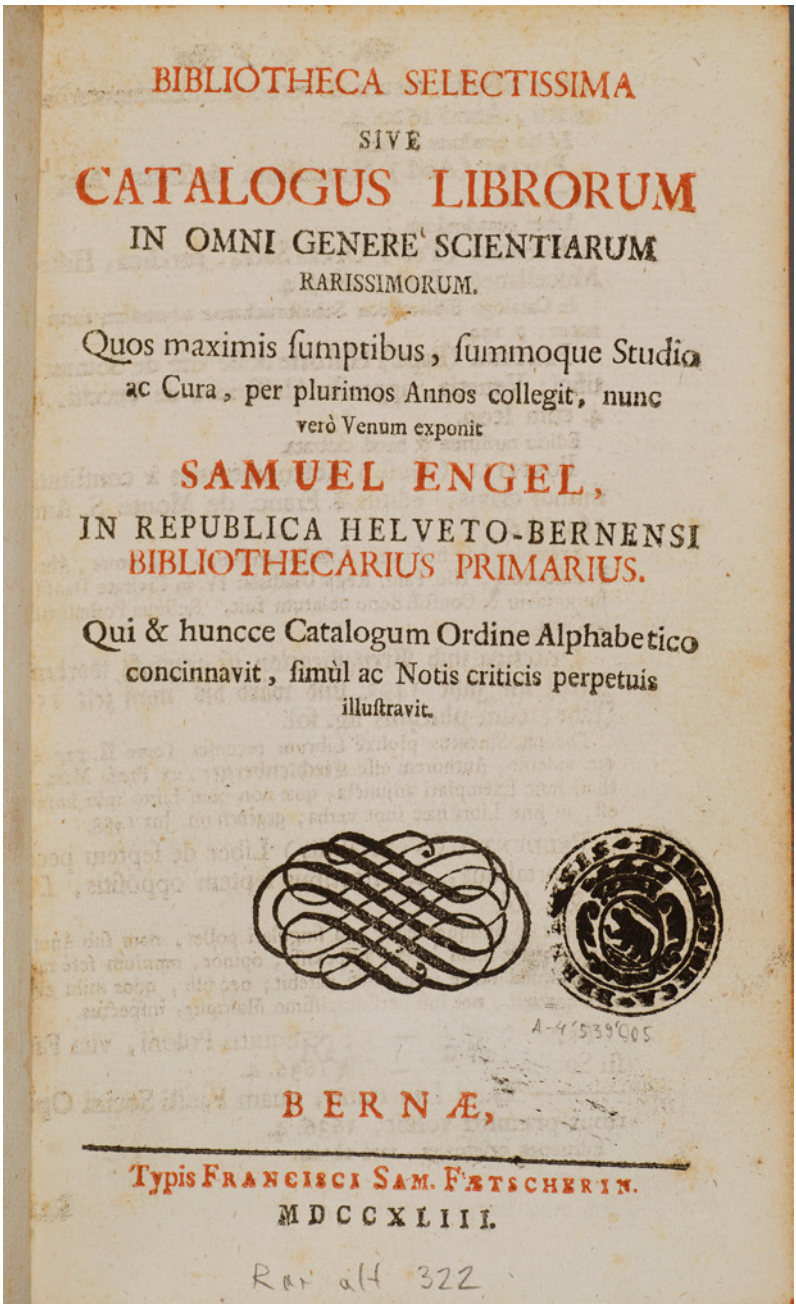
[4] Samuel Engel, *Bibliotheca selectissima sive Catalogus Librorum in omni genere Scientiarum rarissimorum. Quos maximis sumptibus, summoque Studio ac Cura, per plurimos Annos collegit, nunc vero Venum exponit Samuel Engel, in republica Helveto-Bernensi bibliothecarius primarius* (Bern 1743), 3 parts, second part: *Der auserlesenen Bibliothec Von seltenen Büchern Zweyter Theil, in sich haltend einiche Bücher Teutscher und Holländischer Sprach*, third part: *Spicilegium librorum rariorum, tum in Catalogo a Sam. Engel nuper evulgato, omissorum, tum etiam eorum, quibus illa collectio usque adhuc aucta fuit.*

[5] Georg Leyh, 'Die deutschen Bibliotheken von der Aufklärung bis zur Gegenwart', in id. (ed.), *Handbuch der Bibliothekswissenschaft*, vol. III/2: *Geschichte der Bibliotheken* (Wiesbaden 1957), 1–491: 23. See also Torsten Sander, *Ex Bibliotheca Bunaviana. Studien zu den institutionellen Bedingungen einer adligen Privatbibliothek im Zeitalter der Aufklärung* (Dresden 2010).

[6] See Engel 1743 (note 4), *Bibliotheca selectissima,* fol. 7: London, John Nourse; Amsterdam, Petrus Mortier, François Changuion; The Hague, Pieter Gosse; Leiden, Samuel Luchtmann; Paris, Antonius Urban Coutelier, J. Briasson; Frankfurt/M., Ernst August Koch, Franz Varrentrapp; Hamburg, Christian Wilhelm Brand, Johann Carl Bohn, Christian Herold; Lübeck, Jonas Schmid; Altona, Frater Korte; Leipzig, Buchhandlung Grosse, Johann Friedrich Gleditsch; Berlin, Johann Andreas Rüdiger; Nuremberg, Johann Georg Lochner; Ulm, Daniel Bartholomäi & Sohn; Geneva, Heinrich Albert Gosse, Cramers Erben, Frater Philibert; Basle, Johann Jacob Emanuel Thurneisen; Zurich, Heidegger.

[7] See Bloesch 1925 (note 2), 38.


BIBLIOTHECA SELECTISSIMA

SIVE

CATALOGUS LIBRORUM

IN OMNI GENERE SCIENTIARUM

RARISSIMORUM.

Quos maximis ſumptibus, ſummoque Studio ac Cura, per plurimos Annos collegit, nunc verò Venum exponit

SAMUEL ENGEL,

IN REPUBLICA HELVETO-BERNENSI BIBLIOTHECARIUS PRIMARIUS.

Qui & huncce Catalogum Ordine Alphabetico concinnavit, ſimùl ac Notis criticis perpetuis illuſtravit.

BERNÆ,

Typis Francisci Sam. Fætscherin.

MDCCXLIII.

A-41539005

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Fig. 2. Samuel Engel's *Bibliotheca selectissima* (1743, title page), Bern University Library.

Fig. 3. Heinrich Graf von Bünau (1697–1762), oil painting by Louis de Silvestre (1742). Gemäldegalerie Alte Meister, Staatliche Kunstsammlungen Dresden. Copyright SLUB Dresden / Deutsche Fotothek.

they quickly came to agreement on a deal whereby Engel immediately received a sale price of 4,000 talers.[8]

With the purchase of the *Bibliotheca selectissima*, Bünau's library incorporated a rare book collection that was unique in terms of its size; when the library was subsequently sold in 1764 to the Elector of Saxony, it became part of what is today the Sächsische Landesbibliothek—Staats- und Universitätsbibliothek Dresden (SLUB Dresden). The provenance "Ex Bibliotheca Bunaviana" has remained in many call number categories for the historical holdings in the Dresden library, if only owing to the remarkable bindings. However, the volumes that once belonged to the *Bibliotheca selectissima* can only be distinguished with difficulty today or have disappeared entirely as a result of the sale of duplicates as well as wartime damage.[9] Among the 707 incunables that Helmut Deckert found in the Sächsische Landesbibliothek Dresden in 1957, for example, only one could be verified as having belonged to Samuel Engel.[10]

Due to this history of circumstances, Samuel Engel's book collection as well as his related ideas about books and libraries in association with the evaluation of rare books have not been given due attention in research since the work of Hans Bloesch (1925) and Paul Pulver (1937).[11] A new focus on the personality of Engel as a scholarly collector, going beyond the history of libraries provided by these two authors, seems worthwhile. The *Bibliotheca selectissima* in particular constitutes a highly valuable historical source with respect to how scholars at the time dealt with what Julius Petzholdt has called "really rare books".[12] Engel's catalogue of books presents us with a selection which, while it was made on the basis of two different aspects, was always determined solely by the criterion of rarity:

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[8] See ibid., 41.

[9] See Torsten Sander, *Die Auktion der Dubletten der kurfürstlichen Bibliothek Dresden 1775 bis 1777. Ein Beitrag zur Geschichte des Buchauktionswesens* (Dresden 2006); Karl Assmann, 'Die Sächsische Landesbibliothek von 1945 bis 1955. Zerstörung, Wiederaufbau und gegenwärtiger Stand der Arbeit', in id. (ed.), *Sächsische Landesbibliothek Dresden 1556–1956. Festschrift zum 400-jährigen Bestehen* (Leipzig 1956), 29–85: 40.

[10] Helmut Deckert, *Katalog der Inkunabeln der Sächsischen Landesbibliothek zu Dresden. Ein Bestandsverzeichnis nach den Kriegsverlusten des Jahres 1945* (Leipzig 1957), 154, no. 554. Although it is probable that the 14 incunables left from the holdings of the Bibliotheca Bunaviana included some titles purchased by Engel, this cannot be clarified without doubt.

[11] Bloesch 1925 (note 2); Paul Pulver, *Samuel Engel. Ein Berner Patrizier aus dem Zeitalter der Aufklärung 1702–1784* (Bern and Leipzig 1937), 24–52.

[12] Julius Petzholdt, *Bibliotheca Bibliographica. Kritisches Verzeichnis der das Gesamtgebiet der Bibliographie betreffenden Literatur des In- und Auslandes in systematischer Ordnung* (Leipzig 1866), 112.

on the one hand, it represented the part of his extensive library that was designated for sale; on the other hand, it was a literally "select" collection of old printed works which were to be documented in bibliographical terms. This gives rise to a meta-level—independent of the commercially intended but temporally limited offer of collectors' items—where knowledge about "rarity" in the scholarly world, accumulated by Engel simultaneously with his library, is made permanently available.

Hence the following discussion centres on questions of accessibility and evaluation, as well as questions about ways of transferring knowledge contained in books generally acknowledged as rare in the eighteenth century. Given the increasingly noticeable penchant for curiosities and rarities in the course of the European Enlightenment, the criteria used at that time to determine the rarity of a book are of primary interest.[13] The *Bibliotheca selectissima* serves as a template for additional observations on contemporary theories about dealing with rare books which Engel referred to in detail in the preface to his catalogue. Interesting feedback loops become apparent, particularly between the "Axiomata historico-critica de raritate librorum" established by Engel, based on the work of Johannes Vogt (1732), and the way in which these asserted scientific principles were received in relation to comparable cataloguing projects. A further question to be explored is that of the relation of rarity to the literary canon, i.e. whether and to what degree the knowledge contained in rare books is itself subject to the criterion of rarity, and to what extent it may be at risk of falling into oblivion. Does the occurrence of individual printed works regarded as rare on the basis of external features correlate with editorial distribution of individual authors or texts? Here there is a need to consider, among other things, books of which few or no copies remain today and whose existence can be verified only by bibliographical evidence. In addition, prohibited books must not be overlooked.

[13] On this phenomenon, see Caspar Friedrich Neickel, *Museographia, oder Anleitung zum rechten Begriff und nützlicher Anlegung der Museorum oder Raritäten-Kammern. Mit einigen Zusätzen und dreyfachem Anhang vermehret von Johann Kanold* (Leipzig and Breslau 1727), 232–405 (third part: 'Von Bibliothequen'): "And because I did not initially want to deal with libraries in particular, by citing some of them I have at the same time already reported about rare books what I am now about to indicate here." (240)

I

The term "rarity" generally signifies the frequency with which an object or an event occurs. A thing is rare if it does not occur frequently or if it is unlikely to be encountered. With respect to books and printed writings, the moment of rarity can certainly be counted among the "curious manipulations" to which bibliomania resorted "in order to grapple successfully with the mass of identical products spewed forth by the printing press".[14] But such control of a printed edition's inherent seriality for the benefit of few copies of virtually unique character, to which Hermann Tiemann objected in a programmatic article in 1957, is an expression of a bibliophily strongly influenced by aesthetic criteria since the early nineteenth century.[15] Tiemann's assessment fails to recognise that the type of use still had a great influence on the singular value of a rare book in the eighteenth century. Moreover, the passion for rare books at this time was not as uncritical and general as, for instance, Holbrook Jackson seemed to believe in his epoch-making cultural history of bibliomania, *The Anatomy of Bibliomania* (1930).[16] The opposite was the case. Indeed, it was in the eighteenth century in particular when the phenomenon of the rare book specifically aroused academic interest, coupled with the desire for systemisation.[17] The designation "rare" [selten] or "uncommon" [seltsam], as understood at the time, was synonymous with "unusual" or "unorthodox", i.e. something exceptional that deviated from the norm and which, if perhaps not explainable in every instance, was at least to be documented and, if possible, scientifically classified.[18]

The first verifiable monographic work to appear on this topic in the eighteenth century already made it clear how this phenomenon was to be approached in the future: Johann Christian Wendler's *Dissertationem de variis raritatis librorum impressorum causis* (Jena 1711) attempted to dis-

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[14] Hermann Tiemann, 'Sammeln und Lesen. Über Begriff und Ziel der Bibliophilie', *Philobiblon* 1 (1957), 3–19: 11.

[15] See Ursula Rautenberg, 'Zwei Königskinder? Überlegungen zum Verhältnis von Bibliophilie und Literaturwissenschaft', *Philobiblon* 36 (1992), 101–112: 106f.

[16] Holbrook Jackson, *The Anatomy of Bibliomania* (reprint of New York 1950 edn., Urbana and Chicago 2001), 492: "This passion for rarity is so voracious, and often so uncritical, that it has not failed to attract the knowing publisher and bookseller, who see in it fair game for their merchandising arts."

[17] See Michael S. Batts, 'The 18th-Century Concept of the Rare Book', *The Book Collector* 24 (1975), 381–400: 384ff.

[18] See 'Selten, Seltsam, oder Seltzsam', in Johann Heinrich Zedler (ed.), *Grosses vollständiges Universal-Lexikon aller Wissenschaften und Künste* (Leipzig 1743), vol. 36, col. 1721.

tinguish between different types of rare books. Although the 26 examples treated in this work appear arbitrary by today's standards, they nonetheless served as a model for determining *rara* in subsequent decades. The decisive factors were either that an edition was limited from the outset or that it was destroyed after printing, with the exception of a few copies.[19] Estimates of the number of remaining copies world-wide based on these criteria assumed great importance in the future as a basis for determining the value of bibliophile rarities. Thus in 1723 Georg Serpilius answered the question "What qualifies as a rare book?" explicitly by pointing out that:

> in our eyes salvo aliorum judicio a rare book is one that is seldom found in bookshops or in many libraries, or is not found at all; one that most people have never seen and of which, for some scriptis, they even doubted whether it ever existed anywhere in the world.[20]

But neither Wendler's scheme for the classification of rarity with designations from "rara", "rariora", and "rarissimus" [rare, very rare, extremely rare] to "unicum" [unique] that was normally used in book auctions from the late seventeenth century was sufficient to satisfy the need for an enlightened and useful classification of knowledge. For:

> Although a book may be rare this does not necessarily characterise it as good. Rarity sometimes consists only in the fact that a book is not available.[21]

It gradually became apparent that there was a relation between the rarity of a book and its practical value. But in order to document this fact, there was a need for bibliographies that took account not only of a book's occurrence but also of its usefulness for the scholarly world. An early bibliography of this type was provided by Christoph August Heumann in 1718 in his *Conspectus reipublicae literariae sive via ad historiam literariam iuventuti studiosae aperta*, which combined these two aspects in three evaluation categories: "rare and bad", "rare with no particular value", and "rare and good".[22] But a system of classification this simple could not prevail over time. Instead, there was a recognisable trend towards an increasingly theoretical consideration of the term "rare", which almost became an end in

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[19] See Johann Christian Wendler, *Dissertationem de variis raritatis librorum impressorum causis* (Jena 1711).

[20] Georg Serpilius, *Verzeichnis einiger Rarer Bücher* (Frankfurt und Leipzig 1723), vol. 1, 6.

[21] Johann Adam Bernhard, *Kurtzgefaste Curieuse Historie derer Gelehrten* (Frankfurt 1718), 659.

[22] See Batts 1975 (note 17), 386.

itself and only secondarily addressed the needs of scholarly practice with respect to dissemination of bibliographical knowledge. Indeed, the terms "rara", "rariora" and "rarissima", formulated by Joachim Ernst Berger in 1726 as binding for subsequent debate, were lacking in terms of thematically pertinent content.[23]

Johannes Vogt assumed a key role in the explication of Berger's threefold classification system with his *Catalogus historico-critico librorum rariorum*, which was first published in 1732 and appeared in numerous subsequent editions.[24] The author implemented the historical and critical cataloguing technique announced in his title by postulating five "Axiomata historico-critica de raritate librorum" in his preface to be applied in determining the degree of a book's rarity. Here, too, the question of the number of existing copies of a book world-wide was of paramount importance:

> Rari & rariores Libri sunt illi, qui minus frequenter occurrunt, a paucissimis manibus teruntur, inventu quoque & paratu sunt difficiles.[25]

The primary decisive factor in this defining feature of rarity, originally proposed by Jacob Friedrich Reimmann in 1705, was a limited edition, which was usually the case above all with incunables, privately printed editions, and books published by minor publishers.[26] In the course of time, however, printed works whose original and considerably large editions were confiscated and destroyed for various reasons—be it for dangerous content or defacing printing errors—became bibliophile treasures a well. Vogt also counted as rarities books printed in unusual type, as well as multivolume works appearing over a long period of time and, in some cases, remaining incomplete. By contrast, artistic design or provenance played no role in his historical assessment of printed works.

An evaluation scale similar to Vogt's axiomata was put forth several years later in Germany by Melchior Ludwig Widekind in his *Ausführliches*

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[23] See Christiane Lauterbach, 'Rara, Rariora, Rarissima. Vom langen Weg zur Kenntnis des seltenen und kostbaren Buches', *Imprimatur* NF 19 (2005), 9–28: 13f.; Joachim Ernst Berger, *Diatribe de libris rarioribus horumque notis diagnosticis* (Berlin 1726), 10: "Raritas vero non una eademque; dantur enim ejus gradus. Hic liber est rarus, ille rarior, iste rarissimus, quod ipsum infra, exemplo demonstrabo non obscuro."

[24] Johannes Vogt, *Catalogus historico-critico librorum rariorum* (Hamburg 1732, second edn. Hamburg 1738, third edn. Hamburg 1747, fourth edn. Leipzig 1793).

[25] Vogt 1732 (note 24), fol. 6r ("Axiomata Historico-Critica de Raritate Librorum").

[26] See Jacob Friedrich Reimmann, 'De libris raris', *Observationes selectae ad rem litterariam spectantes* 10 (1705), 180–231: 181: "... adeoque per libros raros libros eiusmodi hoc loco intellegere, qui in Bibliopoliis & Bibliothecis non facile reperiri possunt."

Verzeichnis von Raren Büchern mit historischen und kritischen Anmerkungen in alphabetischer Ordnung verfasst (Berlin 1753–1755). This work, however, was really the translation of a systemisation developed by David Clément in his *Bibliothèque curieuse historique et critique, ou catalogue raisonné de livres dificiles à trouver* (Göttingen, Hannover and Leipzig 1750–1760). It was based essentially on a differentiation between absolute and relative rarity, involving a typological concentration of the occasionally quite complex criteria for rarity, most of which had already been introduced by Vogt.

Yet regardless of various models of this type that were continually adapted up to the end of the eighteenth century, the availability of a book in libraries or bookshops long remained the determining criterion for its degree of rarity. Efforts were therefore made to gain a more comprehensive impression of the actual distribution of a book, reaching beyond the local characteristics of individual libraries. As early as 1723, Georg Serpilius had already expressed the wish that

> the more that rare books are held in esteem and the more seldom one sees them . . ., the more one wishes for adequate information about them or at least an alphabetical catalogue of all rare books. And although different people have attempted this task, no one has really succeeded.[27]

Ultimately, it was Johann Jacob Bauer's *Bibliotheca librorum rariorum universalis. Oder vollständiges Verzeichnis rarer Bücher* (Nürnberg 1770–1791) that undertook a decisive step in this direction, marking the apogee of rare book bibliographies in the eighteenth century. The title alone clearly indicates the claim to universality made by this comparatively wide-ranging handbook, which consisted of four volumes and three supplements. Bauer's aim was to finally achieve—after evaluating many listings of rare books, library catalogues, and bookshop inventories—a complete compilation of all previously verifiable rare books, including a designation of their rarity, that would be suitable above all for use in the realm of book publishing.

The dimensions assumed by discussions about rare books in the second half of the eighteenth century can be gleaned from the very comprehensive "Collectio scriptorum, qui de libris rarioribus vel ex instituto egerunt" which preceded the catalogue.[28] The real achievement of the *Bibliotheca librorum rariorum universalis* accordingly consisted in its thorough compilation of bibliographic entries in other catalogues, which, by the

[27] Serpilius 1723 (note 20), 7f.
[28] Ibid., 9–40.

assessments of later critics, was nonetheless inadequate.[29] It remains noteworthy, however, as an earnest attempt to provide a comprehensive solution for the problems related to rare books and thus to bring together the distinctions between absolute and relative rarity, maintained since David Clément, on the basis of objective, i.e. bibliographical facts. In particular, this meant refraining from designing a discrete scale of rarity and, instead, simply reporting the evaluations contained in the various sources. By attempting to provide a universal bibliographical record of catalogue entries of rare books, Bauer's compendium constituted an independent resolution of the underlying issue associated with the phenomenon of rare books: the question of the distribution of individual copies.

II

> Most scholars are bibliomaniacs, though there are few scholars among actual bibliomaniacs.[30]

Just how much attention Samuel Engel devoted to these attempts at systemisation following the sale of his rare book collection may never be known. The intensity with which he intermittently followed the discussion, however, is amply documented in the preface to the *Bibliotheca selectissima*. In addition to Wendler, Heumann and Vogt, other key figures named here include Johann Georg Schelhorn and Georg Jacob Schwindel alias Theophil Sincerus, as well as Nicola Francesco Haym, who did groundbreaking work on bibliographies of Italian literature. Moreover, catalogues of the Krafft, Mencke, Uffenbach, and Reimmann collections played an equally important role in Engel's work; their exemplary amplitude of bibliographical details could be used a basis for objective evaluation of a putatively rare book. By referring to these noted authorities in the field of scholarly knowledge of books, Samuel Engel was affirming his claim as a librarian to create a valid catalogue of books for more than just the

[29] See Friedrich Adolf Ebert, *Allgemeines bibliographisches Lexikon* (Leipzig 1821), vol. 1, 147, no. 1772: "Overcompl.[ete] Coll.[ection] lacking selection a. bibliogr.[aphic] precis.[ion]." Petzholdt 1866 (note 12), 114: "Contains an alphabetical catalogue of books compiled without special selection and bibliographic accuracy and in respect to which the compilers and editors are far too free in the use of terms such as "raruss, rarissimus, albo corvo rarior, infrequentissimus, paucissimus incognitus" a.[nd] suchl.[ike] for their evaluation to be taken seriously."

[30] Alexander Košenina, *Der gelehrte Narr. Gelehrtensatire seit der Aufklärung* (second edn., Göttingen 2004), 134.

auction. This catalogue is initially difficult to distinguish from what was normally prepared for auctions in the eighteenth century. It consisted of three separately paginated parts, the first of which was a 186–page list of Latin titles. All entries were arranged alphabetically according to author. There were no further sub-categories such as subject group or format. Entries contained the bibliographical information necessary for unequivocal identification of an edition: author, title, place and year of publication, as well as the edition and the format. Where an imprint page was lacking, Engel attempted to date the book in question and determine its geographic origin based on typographical or filigranological features.[31] In most cases he complemented his entries with bibliographical evidence, combined with more or less comprehensive comments about the book's rarity. We shall examine this in more detail below.

Der auserlesenen Bibliothec Von seltenen Büchern Zweyter Theil consists of 40 pages of book titles in German and Dutch, followed by 62 pages of a comprehensive *Spicilegium* with books and manuscripts that Engel apparently decided to auction only during the printing of the catalogue, owing to his precarious economic situation; the afterword dates from 14 July 1744.[32] The consignor actually seems to have speculated initially about selling only as much of his treasure trove of books as necessary to pay off his debts.[33] Letters from Engel to Bünau's librarian Johann Michael Francke, which were unknown to either Bloesch or Pulver, suggest that only a portion—although certainly the greatest portion—of the books originally intended for the city library of Bern were recorded in the *Bibliotheca selectissima*. Following the transfer of his collection to Count Bünau, Engel laid claim to a series of alleged duplicate and triplicate copies which were also contained in the boxes stored in Frankfurt and were inadvertently transported to Nöthnitz Castle, where the Bünau library was located. According to an agreement between Engel and Bünau which Engel reported by letter to Francke, Bünau had purchased exclusively the titles listed in Engel's three-part catalogue. Engel thus requested that

[31] See Bloesch 1925 (note 2), 61.

[32] See Engel 1743 (note 4), *Spicilegium*, 59; as well as review of the same, dated 20 August 1744, *Göttingische Zeitungen von Gelehrten Sachen* 67 (1744), 581–582.

[33] See the hand-written note in the copy in the SLUB Dresden (call number 41.8.336): "M. Fr. Gu. Noldius/Koenigs./1746./ Of the other part only few copies appeared, as a certain Count (Bünau) [added later in another handwriting; author's note] purchased the entire library when it was still in press. Hence the 2nd part is even rarer than the first. See Göthing. Gel. Zeitung de ao 1744, p. 132. seqq."

non-catalogued books and any existing second copies be returned, so that he could sell them elsewhere:

> When I entered into negotiations with His Excellency regarding my collection, I had the honour to immediately declare to him that there were various books in the barrels and boxes that were not contained in the catalogue, particularly the one or other duplicate, all of which, along with Serveto, were reserved for me; to which His Excellency gave the following considered and reasoned answer: that it was completely natural that he purchase from me the books he saw listed in the catalogue, whereas those not listed he could neither evaluate nor purchase and wished to leave to my disposition. Now His Lordship refers to all those books, in different editions, although some are not to be found in the catalogue and His Excellency cannot have purchased and I cannot have sold them; e.g. *Agrippo Opera apud Beringos,* listed in my catalogue at the very low price of Rg 6; His Excellency reduced this very low price still further, to 4 to 5 Rg; thus for the second copy, of which he was unaware, he did not add the same amount in his calculations, nor did I take into consideration such a duplicate copy; so that His Excellency cannot have conceived of those books and copies of which he had not the slightest knowledge, let alone evaluate or purchase; I bring all this up here only to show for what reason I have reclaimed such copies as duplicates.[34]

Nevertheless, Heinrich Count of Bünau also made some claim to these volumes, as he detected among them books that were lacking in his collection. Out of particular respect for Bünau, Samuel Engel was fully prepared to make accommodations in these cases, even though his annoyance at a further financial loss can be detected in his letter to Francke. Bünau had, after all, already negotiated the sale price for the library downwards from 6,000 to 4,000 talers. One copy reclaimed by Engel—Michael Servetus's *De Trinitatis erroribus libri VII*, published in Frankfurt in 1531—was, however, listed on page 52 of Engel's *Spicilegium*, as Francke noted in a handwritten entry in the margin of the letter referred to here, and was thus rightfully purchased by Count Bünau, thereby invalidating the additional sale price of 60 talers proposed by Engel.

After hesitating initially, the city librarian of Bern left the question of duplicate copies to the "disposition" of the purchaser of his library, allowing

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[34] ULB Sachsen-Anhalt, Halle a.d. Saale: Pon. Misc. 2°. 13. Sammlung von lateinischen deutschen und französischen Briefen verschiedner Gelehrten an den verstorbenen Chfstl. Sächßs. Geheimen Secretarium und Bibliothecarium vormahligen Gräfl. Bünauischen Bibliothecarium Johann Michael Franken. [A collection of letters in Latin, German, and French written by various scholars to the late Saxon Elector's Privy Secretarium and Bibliothecarium, previously the Comital Bünau Bibliothecarium, Johann Michael Franken.], no. 19, Samuel Engel to Johann Michael Francke, Bern, 30 January 1745. fol. 38–41: 38v ff.

Bünau to choose works that he needed for his library. Because of the remaining duplicates, Engel asked that "timely notice be given about the auction, including communication of the catalogue, as Your Excellency has graciously promised to advertise my books with yours in the catalogue, and to auction them and account for the proceeds . . ."[35] Engel also requested Bünau to send him a pertinent list so that he could set price limits for the books to be auctioned. From all appearances, it seems that Bünau intended to auction the duplicates in his library together with Engel's. But there is no record of this process in terms of either a catalogue or an auction, nor any other evidence for this planned undertaking.

This hitherto unknown side chapter in the history of Engel's collection is an indication of the economic aspects of bibliophily, which are not insubstantial. Rare books, after all, are acknowledged objects of value which one endeavours to preserve and increase and which should in no case be sold for less than they are worth. Samuel Engel was certainly aware of this, as revealed in an exchange of letters with Albrecht von Haller:

> I have to admit that I had the intention of describing our library. But I am utterly disheartened after having acquired rare books worth approximately 3,000 Rth and learning that there is no interest in including them in the library, not even in part, so that I will be forced to offer them elsewhere as I have already done in England but without success.[36]

Samuel Engel's original intention was to sell his entire collection in one piece, as public auctions always involved certain risks. His concern with providing qualitative evaluations of the titles in the collection was thus by no means based solely on bibliographic interest, but also arose from his intention to highlight the special features of his collection for potential purchasers. He cited the five criteria for rarity advanced by Johannes Vogt as the basis for his descriptions, complementing them with his own "Annotata ad Axiomata".[37] In doing so, Engel wished above all to make the established scale of "rarus—rarior—rarissimus" far more differentiated by linking it with typographical aspects as well as annotations on the history of the given editions. This approach to rare books was derived from his attention to the origins of the art of book printing, especially filigranology (the science of watermarks).[38] Engel was one of the first to

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[35] Ibid., fol. 40r–41v.

[36] Samuel Engel to Albrecht von Haller, Bern, 18 July 1742. Quoted by Bloesch 1925 (note 2), 33.

[37] Engel 1743 (note 4), *Bibliotheca selectissima*, fol. 4v.

[38] See Bloesch 1925 (note 2), 16.

recognise the need for a careful description of all known watermarks, as he considered them to be important sources of historical classification and evaluation of old printed works:

> My observations on the subject are as follows 1. the markings on the paper were not always the same, nor did they remain so for long. For example, the famous ox's head can indeed be found in various books, but in our library's Bible, which I believe dates to around 1455, it is chracterised by a long line, while in other books the line is shorter; in some books the mark appears with the cross directly above the head and no line in between, and yet in others with a crown at the end of the line instead of the cross. Since these marks can be found in dated editions, this will help somewhat in determining the dates of the undated editions. The majority of fifteenth-century editions carry the mark of the rose; others are marked in such varied ways that it is hard to know what to make of them. 2. Admittedly, no definitive conclusions can be made concerning what follows; but as there are many wrong dates and editions that are believed to be older than they really are, one could rectify this by knowing and observing these marks. For instance, if one was to date a particular edition at around 1460 and one was to find a mark in an edition dating from 1480 without finding any trace of this mark in previous editions, one would have to assume that the edition is not as old as it was thought to be. Finally, I believe that it would be of great use if scholars helped to create an anthology of these marks.[39]

Engel advocated, for instance, that not only all incunables published up to 1500 be regarded as rare books—which was the generally accepted practice—but that this time frame be extended forward by at least 20 if not 40 years. Even though Engel was not yet familiar with the term "post-incunable", his plea anticipated the consensus associated with this term today, according to which books published up to 1520 or 1540 (as in the Netherlands) are considered to constitute a unit in the history of printing.[40] By taking this early period of printing into consideration, Engel hoped that not only works which were very influential in the European art of printing in the sixteenth century would be taken into account as bibliophile rarities—such as those produced by Manutius (Venice), Giunta (Lyon), and Stephanus (Paris)—but also, among others, works produced by Sebastian Gryphius (Lyon), Christoph Plantin (Antwerp) and the Basle

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[39] Samuel Engel to Albrecht von Haller, Bern, 4 October 1741. Quoted by Bloesch 1925 (note 2), 17f.

[40] See C. Weismann, 'Postinkunabeln', in Severin Corsten, Stephan Füssel and Günther Pflug (eds.), *Lexikon des gesamten Buchwesens* (second completely revised edition, Stuttgart 2003), vol. 6, 71.

printers Johannes Oporin, Nicolaus Episcopius, and the Froben family.[41] Works printed by these publishing houses are characterised not only by their outstanding typographical and artistic qualities but also by the fact that they were frequently the objects of censorship or targeted for destruction.

This concept of printing history, which expanded the criteria for rarity advanced by Vogt, had two main results. First, Engel proposed—based on Heumann's description of so-called "libri phoenices"—closer examination of books that were not necessarily considered rare but which were nonetheless seldom encountered [minus obvius].[42] Thus in addition to the classical units of evaluation, Engel also used individually tailored evaluations based on the knowledge of bibliography he had acquired, for instance: "Liber incognitus valde & perrarus", "Editio perquam rara, Libri non minus rari" and "Liber in ipsa Helvetia perrarus & olim à Bibliothecariis nostris frustra quaesitus".[43] Secondly, he formulated three additional axioms for determining rarity which took account of both quantitative and qualitative aspects:

> Ax. I. Alii Libri rari sunt, quoad materiam, alii quoad formam, alii quoad utrumque. . . .
> Ax. II. Non omnes Libri, qui in plurimis Librariorum Tabernis non apparunt, sunt rari, e contra Liber cujus Titulus in unius vel alterius Biblipolae Catalogo legitur, non statim hanc ob causam satis obvius nominandus est. . . .
> Ax. III. Libri sine die & consule editi fere omnes rari sunt.[44]

Engel's expansion of the scientific criteria for rare books established by Vogt appeared, in turn, in the third edition of Vogt's *Catalogus historico-critico librorum rariorum* published in 1747, which, at 735 pages and approximately 3,000 verified titles, had grown to be more than three times as long as the first edition of 1732, and for the first time contained the word "bibliophily" in its title. The intention was to highlight more clearly the demand for a pertinent handbook on questions of rarity for use by the literary public.[45] Taking Engel's explanatory notes into account, there was

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[41] See Engel 1743 (note 4), *Bibliotheca selectissima*, fol. 5v.

[42] See ibid., fol. 4v (comment on Axiom II).

[43] Engel 1743 (note 4), *Bibliotheca selectissima*, 9: "Aretii (Bened.) Commentarii in Pindarum. Ex Offic. le Preux, 1587. 4to." Ibid., *Spicilegium*, 1: "Alexandri (Anglici) destructorium vitiorum, Norimberg. per Ant. Koberger, 1496. fol." Ibid., 54: "Valdesii (Jacobi) de dignitate Regum Regnorumque Hispaniae, &c. Lib. Granatae, 1602. fol."

[44] Ibid., *Bibliotheca selectissima*, fol. 6r–6v.

[45] Johannes Vogt, *Catalogus historico-critico librorum rariorum, jam curis tertiis recognitus et copiosa accessione ex symbolis et collatione bibliophilorum per Germaniam doctissimorum*

now a differentiated system of six "Axiomata generalia" and 15 "Axiomata specialia" for determining the rarity of a book in both quantitative and qualitative terms.[46] Even though the bibliographical value of this compendium received virtually no recognition as of the nineteenth century, the work of Johannes Vogt nonetheless bears testimony to early efforts to deal with the question of *libri rari* on a rational basis.[47]

III

For his bibliographical description Samuel Engel did not take account of book bindings and he noted provenance only in exceptional cases. But as fate would have it, a prominent copy of Gregorius's *Dialogi* printed in 1473, which he attributed to Martin Luther and categorised as "Cimelium summae Raritatis", has more recently been discovered to be a mistaken attribution.[48] As a rule, however, Engel ignored such attributions and concerned himself with evaluating printed works based on objective criteria. He thus refrained from setting his books off against the inherent sameness of all copies of an edition—"*Auflagengleichgültigkeit*", as Gustav Adolf Erich Bogeng put it—on the basis of external features.[49] Count Heinrich of Bünau also subscribed to the same approach, having most of the books in his library, including a portion of the ones he had purchased from Engel, removed from their original bindings and bound in uniform leather or half-leather bindings. This ensured arrangement of the books according to their contents; however, it also had the effect that volumes from Bünau's library later became sought-after collectors' items—or, as

adauctus (Hamburg 1747). "Bibliophily" was first the object of a printed scientific work in Willem Salden's treatise *Bibliophilia sive de scribendis, legendis et aestimandis libris exercitatio paraenetica* (Utrecht 1681).

[46] Vogt 1747 (note 45), fol. 7–11.

[47] See Friedrich Adolf Ebert, *Allgemeines bibliographisches Lexikon* (Leipzig 1830), vol. 2, 1063, no. 23859: "That this book, worthy for its earliest appearance (as the edition of 1753 was already to have had a very different form) is now only of historical interest and counts merely as a reflection of the preferences of Dutch-German collectors in the first third of the previous century but has no real scientific-bibliographic value, is a fact that should finally be more widely recognised in Germany than is unfortunately the case."

[48] Engel 1743 (note 4), *Der auserlesenen Bibliothec*, 18. See Deckert 1957 (note 10), 105, no. 338.

[49] Gustav Adolf Erich Bogeng, 'Der Begriff der Seltenheit beim Buche', *Monatsblätter für Bucheinbände und Handbindekunst* 2 (1925/26), 10–20: 16. One exception is a copy of Battista Guarini's *Pastor fido* (Amsterdam 1678), which Engel marked the comment "Editio & Ligatura nitidissima". See Engel 1743 (note 4), *Bibliotheca selectissima*, 68.

Bogeng put it, "rarities by virtue of quality" [Qualitätsseltenheiten].[50] The provenance "Ex Bibliotheca Bunaviana" appeared to be an automatic confirmation of the qualities that make a "good" book.

For a scholar in the eighteenth century, a "good" book was one that "1) contained useful things, and was 2) thorough, 3) well-ordered, 4) clear, and 5) enjoyable in style."[51] Quite often, scholars also cited "rarity as the mark of a good book".[52] Already in 1708 Jacob Friedrich Reimmann had expressly emphasised the relation between "knowledge of books" as a constitutive term in literary history and the term "rarity". Reimmann's *Versuch einer Einleitung in die Historiam Literariam so wohl insgemein als auch in die Historiam Literariam derer Teutschen insonderheit* (Halle 1708), which later appeared in numerous editions, was concerned among other things with using a "guideline" to more clearly accentuate the generally acknowledged, although not usually further explained recommendation of scholars "to take note only of the principal examples among the immense number of books", whereby

> The leading authors in the *notitia librorum* are those who have written 1) about a subject for the first time; 2) for the last time; 3) as the only ones; 4) in the most paradoxical and special way; 5) most excellently; and 6) are the least common and most rarely encountered of all.[53]

The aspects mentioned here were reiterated in exemplary fashion for the "Scriptores Historiae Ecclesiasticae N.T.", with the following rare books cited in this section:

> (a) Sebastian Francken von Wörd's *Chronicon*, (b) Hermanni Hamelmanni *Renatum Evangelium*, (c) Lubienjecii *Historia Reformationis Poloniae*, (d) Casparis Bruschii *Opus de Omnibus Episcopatibus Germaniae*, (e) Josephi Scaligeri *Thesaurus Temporum*, (f) Guilielmi Buddei *Vita Alberti II*, and (g) Nicolai Vedelii *De Episcopatu Constantiini Magni*, and other similar works that I do

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[50] Bogeng 1925/26 (note 49), 14.

[51] See Gottlieb Stolle, *Anleitung zur Historie der Gelahrheit* (fourth edn., Jena 1736), 6: "§ VIII. What constitutes a good book?".

[52] Ibid., 9: "§ XVII: Many hold rarity to be the mark of a good book and pay little attention to one that can be had everywhere." In other places, however, critical comments can be found according to which "the rarity of a book is more often a sign of little value rather than special value." Vogt 1747 (note 45), fol. 8v.

[53] Jacob Friedrich Reimmann, *Versuch einer Einleitung in die Historiam Literariam so wohl insgemein als auch in die Historiam Literariam derer Teutschen insonderheit* (Halle 1708), 196.

> not wish to meticulously note here as these books belong ad notitiam, librorum acroamaticam, mysticam & telesticam.[54]

It is noteworthy that for Reimmann familiarity with rare books was a type of clandestine knowledge that circulated only "among scholars . . . book sellers, book printers and book binders", in short, everyone who dealt with books:[55]

> The ancient pagan philosophers generally divided knowledge into two classes: acroamaticas & exotericas. They taught the exotericas to anyone who entrusted themselves to their teaching. The acroamaticas, however, they either kept entirely to themselves or shared only with those whom they had taken into their closest and most secret confidence. And thus it is today with the *notitia librorum*, which is also acroamatica & exoterica. The exoterica consists of books I know that are common and which we can find quite easily in bookshops and libraries. The acroamatica consists of printed and written books that I know are rare and which can seldom be found in bookshops and libraries.[56]

The characteristic of rare books that Reimmann introduced into debate by describing them as arcane objects excluded from the general scholarly canon, along with the related expression "uncommonly rare", is also an indirect indication of the realm of prohibited literature.[57] As the knowledge contained in prohibited books was not to be disseminated and thus was consigned to inevitable oblivion, these books also frequently became rare. This, in turn, had the effect of drawing greater attention to them. As a rule, the public burning of a prohibited book actually aroused general interest in it which it had not previously enjoyed. Certain publishers with a clever head for business took devious advantage of these circumstances "by having others arrange for or allow that the books they published be publicly condemned or confiscated and burned by the executioner so that they would subsequently be more avidly sought and thus bought at a higher price."[58]

Five editions of the *Index librorum prohibitorum* or *Index librorum expurgatorum* therefore occupy a special position within the well-represented genre of indexed titles in the *Bibliotheca selectissima*. These books not

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[54] Ibid., 198.
[55] Ibid., 201.
[56] Ibid., 199.
[57] See the discussion of Engel's *Spicilegium* in the *Göttingische Zeitungen von Gelehrten Sachen* 67 (1744), 581–582: 581, "and seven extraordinarily rare books of Petri Aretini".
[58] Georg Paul Hönn, *Betrugs-Lexicon, worinnen die meisten Betrügereyen in allen Ständen nebst denen darwider guten Theils dienenden Mitteln entdecket* (Coburg 1724), 88.

only count among the *libri rari* themselves but above all provide a reliable compilation of titles that had become rare due to their prohibition and the resulting measures taken to destroy them. If, as in the case of Giordano Bruno, an entire literary corpus [opera omnia]—and thus also the knowledge documented in it—was prohibited, it seems obvious to ask about the relation of rarity to the literary canon.[59] A fairly considerable effort in bibliographic research would yield a pattern of case studies within which the editorial distribution of individual texts could be verified. But this chronological description of a publication says nothing about contemporary awareness of an author and his work among the literary public. Already towards the end of the eighteenth century many books were regarded as worthy of becoming part of the collections of public libraries, thus being incorporated into collective memory "owing merely to their rarity".[60] However, Engel and his contemporaries were also aware that there were books in which no one was interested even though they were rare; consequently, they were not objects of (bibliographic) notice. Rarity and what is "of rare interest", to use Nikolaus Wegmann's term, thus characterise first of all nothing more than a "frame of reference" within which the reader's interest was awakened in individual books that stood out for having the designation "rare".[61] In this way "rarity" became a question linked with the possibility of applying knowledge and learning something new.

Samuel Engel, for instance, considered the *Stern des Meschiah* by Petrus Nigri, printed by Conrad Fyner in Esslingen on 20 December 1477, to be "stupendae raritatis" [of stupendous rarity].[62] The edition was even considered rare to such a degree (inconceivably rare) that many people doubted it had been printed at all. The exceptional in this case expanded almost into the realm of the imaginary. What Engel took for unique exists today in the form of several copies, including those in the libraries of Göttingen, Gotha (fragment), Munich and Regensburg. Yet Engel's astonishment

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[59] See *Index librorum prohibitorum S*[*ancti*]*S*[*si*].*mi D*[*omini*] *n*[*ostri*] *Pii PP. XII. Sum. Pont. jussu editus* (Civitas Vaticana 1948), 66: "Bruno, Giordano. Opera omnia. Decr. S. Off. 8. febr. 1600."

[60] Johann Georg Schelhorn, *Anleitung für Bibliothekare und Archivare* (Ulm 1788), vol. 1, 341: "These [i.e. rare books; author's comment], even if they are noteworthy only for their rarity, merit being sought [sic!] for a reputable library and kept there. I am speaking of libraries that are devoted to public use, and hence the reason these books have earned a place there is easy to surmise."

[61] Nikolaus Wegmann, *Bücherlabyrinthe. Suchen und Finden im alexandrinischen Zeitalter* (Köln 2000), 178.

[62] Engel 1743 (note 4), *Der auserlesenen Bibliothec*, 33.

at the rarity of this incunable—which he himself could not explain but which was nonetheless verifiable by the existence of one copy—points to the realm of lost and fictitious titles. Both are inseparably linked with the aura of the rare and have a long tradition. While Johann Albert Fabricius's *Bibliotheca Latina* was based on bibliographic documentation of fragmentarily preserved or even completely vanished titles from antiquity, catalogues such as the *Catalogus etlicher sehr alten Buecher, welche neulich in Irrland auff einem alten eroberten Schlosse in einer Bibliothec gefunden worden, Anno 1649*, which contained among other things "Der H.[eiligen] drey Könige Reise-Gesangbuch" [The Three Wise Men's Travel Songbook] belong to the realm of satire.[63] But in both cases—as Nikolaus Wegmann stated—the term "rare" "served as a leading semantic category of distinction among book collectors and bibliomaniacs."[64]

Nevertheless, when the rarity of a title is exaggerated to a fictitious degree, the value to scholarship of the primacy of rarity as a category becomes questionable. For it is not infrequent that books in this category are "books whose existence is maintained in order to outsmart a public eager for learning and which has to know about everything without being able to read everything."[65] In this respect the rarity of a book, as determined on the basis of different qualities, always remains only *one* indication of its notice and its selection from among the great number of works in print. The efforts made in the eighteenth century to document the phenomenon in rational terms finally freed the *libri rari* from being perceived as exceptional and unobtainable objects. Documentation of titles in catalogues of collections and auctions culminated in lists of rare books: special bibliographies that give credible testimony to the existence of a printed work, thus making it seem available to the scholarly world. Even though Samuel Engel did not succeed in giving his collection a permanent institutional character in the form he intended, the bibliographical material collected in the *Bibliotheca selectissima* is still of great importance for historical evaluation of rare printed works of interest to bibliophiles.

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[63] *Catalogus etlicher sehr alten Buecher, welche neulich in Irrland auff einem alten eroberten Schlosse in einer Bibliothec gefunden worden, Anno 1649* (reprint of the original edn. without place or date [ca. 1649], Hamburg 1925), fol. 3: Theologische Bücher, no. 11.

[64] Wegmann 2000 (note 61), 179.

[65] Manfred Pabst, 'Das fiktive Buch. Kein Ende der Fiktionen' [review of Christian Schäfer-Manz, *Das fiktive Buch. Theorie—Geschichte—Wirkung*, Verlag Mohr und Ruprecht, Tübingen, 1991)], *NZZ-Folio* 1 (1991), issue 12: *Verführungen*, 67. Unfortunately, the work elaborately presented by the reviewer as the "first monograph on this subject" with "the first reliable bibliography of fictitious writing" provided in the appendix, is only a fictional work as well.

PART THREE

PERCEIVING AND REACTING: THE MAN OF HIS TIMES

THE *PHILOSOPHE* AS A VIRTUOSO OF COMMUNICATION: MEDIA, SPACES AND STRATEGIES IN VOLTAIRE'S PRACTICE OF COMMUNICATION DURING THE "CALAS AFFAIR"

Kirill Abrosimov

In considering the place of the eighteenth-century scholar in his contemporary society, and in particular the modalities of his participation in social processes beyond purely literary and scientific fields of endeavour, it is possible to reconstruct historically a role model aside from the functions of civil servant and adviser to princes—that of the publicly engaged critical intellectual. Although it may sound anachronistic to use this term in relation to the Age of the Enlightenment, there are nevertheless good reasons for drawing structural parallels with the role of modern intellectuals, particularly in the case of the French *philosophes*. According to Pierre Bourdieu, an intellectual is a person who uses the symbolic capital he has accumulated in an autonomous scientific or artistic field to intervene in the political arena in the name of universal values.[1] This purely formal definition of the intellectual's action pattern, which purposely avoids any essentialisation, can be applied to the *gens de lettres-philosophes* of the eighteenth century, with the characteristic forms of Enlightenment communication practices coming to the fore.[2]

At first glance, the intellectual engagement of the Enlightenment philosophers corresponds to the concept of the "bourgeois public sphere"[3] developed by Jürgen Habermas which, despite numerous critical objections and corrections in detail, still appears to dominate research on the Enlightenment.[4] According to Habermas, "private people assembled to

[1] Pierre Bourdieu, *Les règles de l'art. Genèse et structure du champ littéraire* (Paris 1992).

[2] Kirill Abrosimov, 'Die Genese des Intellektuellen im Prozess der Kommunikation. Friedrich Melchior Grimms "Correspondance littéraire", Voltaire und die Affäre Calas', *Geschichte und Gesellschaft* 33 (2007), 163–197.

[3] Jürgen Habermas, *Strukturwandel der Öffentlichkeit. Untersuchungen zu einer Kategorie der bürgerlichen Gesellschaft* (Frankfurt/M. 1999), 69–121.

[4] See the recent work by James van Horn Melton, *The Rise of the Public in Enlightenment Europe* (Cambridge et al. 2001); and Timothy C.W. Blanning, *The Culture of Power and the Power of Culture. Old Regime Europe 1660–1789* (Oxford 2002). For a critical assessment of the historiographical reception of Habermas, see Harold Mah, 'Phantasies of the Public Sphere. Rethinking the Habermas of Historians', *The Journal of Modern History* 72 (2000), 153–182.

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form a public" constituted an independent and universally accessible forum of critical reasoning which Enlightenment intellectuals addressed in order to stimulate the collective search for truth. This process resulted in universal judgements that questioned all traditional structures of authority and rule and forced them to undergo self-revision.[5] Contemporary concepts of *public opinion* as a mediating instance between reason and morality, on the one hand, and politics, on the other, lend additional plausibility to this explanatory model.[6] Yet Habermas's model of interpretation conceals more than it reveals. The normative definition of public communication as rational, universal and transparent leaves central characteristics of the culture of communication in the eighteenth century unaccounted for. Two key points in particular appear to be in need of revision in this respect.

The majority of public statements addressed to the general reading public can hardly be made congruent with the much-heralded ideal of a consensus-oriented search for truth guided by reason. On the one hand, particularly in France, where the literary world was deeply divided, the philosophes were engaged in many conflicts and polemics where the issue was not "the unforced force of the better argument" (Habermas) but the use of every available means, including satirical vilification of one's opponent, to ensure that one's own claims to power and validity prevailed.[7] On the other hand, in winning over the public, they focused not only on the persuasive power of rational argumentation but above all on creating emotional identification with the "good cause", based on the mechanism of aesthetic overwhelming.[8] At the level of discourse, too, there was no point at which the affirmative vision of the public as the highest instance of authority ever achieved clear dominance among the ideas held by

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[5] Kant's concept of "the public use of reason", proposed in 'An Answer to the Question: What Is Enlightenment?', *Berlinische Monatsschrift* 4 (1784), 481–494, provided Habermas with a matrix for his model of the public sphere.

[6] For France, see Mona Ozouf, 'L'opinion publique', in Keith Michael Baker (ed.), *The Political Culture of the Old Regime* (Oxford 1987), 419–434; Keith Michael Baker, 'Public Opinion as Political Invention', in *Inventing the French Revolution. Essays on French Political Culture in the Eighteenth Century* (Cambridge 1990), 167–199. For a critical review, see Harvey Chisick, 'Public Opinion and Political Culture in France during the Second Half of the Eighteenth Century', *English Historical Review* 470 (2002), 48–77.

[7] Olivier Ferret, *La fureur de nuire: échanges pamphlétaires entre philosophes et antiphilosophes (1750–1770)* (Oxford 2007).

[8] See Diderot's programmatic work on this concept with regard to the example of the theatre: Denis Diderot, 'De la poésie dramatique', in id., *Oeuvres complètes*, ed. by Herbert Dieckmann, Jacques Proust and Jean Varloot (Paris 1975ff.), vol. 10, 325–427.

French Enlightenment thinkers; it was always accompanied by the opposite vision of a vacillating and easily manipulated public.[9]

A further serious weakness in Habermas's paradigm of the public sphere consists in its latent teleological structure, which imputes to Enlightenment communication practices a tendency to develop towards the greatest possible degree of publicity. On the contrary, Enlightenment thinkers were deliberately active in a number of specific action spaces or segments of the public sphere, which each had their respective rules of communication—intimate circles of like-minded individuals, the *République des lettres* and its institutions, and the ruling elites, on the one hand, and a broad national or European reading public, on the other hand. Acting in these distinct spheres, they had to assume different communication roles and make use of particular, and in some cases exclusive, media channels. Enlightenment communication strategies accordingly consisted of complex mixed practices of publicity and exclusivity, with the latter sometimes having structuring functions. It will be argued here that Enlightenment styles of communication, and hence also the forms of intellectual engagement characteristic of the age, were not overly in line with the postulate of publicity, which leaves no alternative; rather, they consist of the virtuosity with which the *philosophes* employed the specific functional logic of different media and circles of communication in order to advance the comprehensive social reform project that was the Enlightenment.

This thesis will be explored, using the example of a legal scandal that took on global historical significance thanks to Voltaire's involvement. On 9 March 1762, the Calvinist cloth merchant Jean Calas was sentenced to death by the appellate court [Parlement] in Toulouse and executed for the murder of his oldest son Marc-Antoine, despite a lack of evidence. The reason behind this wrongful execution was the fanatic hatred of Protestants, which was particularly pervasive in Toulouse.[10] As the result of a comprehensive, three-year-long campaign, Voltaire eventually achieved full rehabilitation of the Calas family.[11]

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[9] Nicolas Veysman, *Mise en scène de l'opinion publique dans la littérature des Lumières* (Paris 2004).

[10] David D. Bien, *The Calas Affair. Persecution, Toleration and Heresy in Eigtheenth-Century Toulouse* (Princeton 1960).

[11] For a chronology of Voltaire's activities, see Robert Granderoute, 'Voltaire et l'affaire Calas. Introduction générale', in *Oeuvres complètes de Voltaire/The Complete Works of Voltaire* [OCV] (Oxford 2000), vol. 56b, 3–102.

This improbable success was seen already in its own time as an epic victory over religious intolerance. Research on the Enlightenment has focused heavily on the claims made by Voltaire in the course of the Calas affair. With respect to his communication strategy, either attention has been called to the novelty of Voltaire's appeal to public opinion[12] or it has been stated that his concept of the public was elitist and hierarchical at its core, meaning that his public engagement was deficient in character.[13] The multi-dimensional communication practices that were developed and, to some extent, conceptualised in the context of the Calas affair have so far not been submitted to any systematic analysis. As a first step to this end, we shall examine the objectives of Voltaire's engagement and the circles he addressed. Three different communication strategies used in the course of the affair, which are representative of the entire broad spectrum of communication practices among the French *philosophes*, will then be reconstructed in detail.

Objectives and Readership

Voltaire pursued several goals simultaneously in the course of transforming a local criminal case into the pan-European *affaire Calas*. His first concern was to overturn the judgement of the *Parlement* in Toulouse, which he regarded as scandalous. However, as the *Parlements* in France during the Ancien Régime were the courts of last resort, an *arrêt du parlement* like the one in the Calas case was extremely difficult to overturn.[14] It was first necessary to convince the high court in Toulouse to make the case records available to the King's Council. Only with knowledge of the reasons for the judgement could *le Roi en son conseil* order that the judgement be quashed and the case reopened. In addition to the great formal obstacles involved, there was also the matter of dealing with bitter resistance on the part of the judges in Toulouse, whose judicial authority was at stake.[15]

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[12] James Hanrahan, 'Creating the "cri public": Voltaire and Public Opinion in the Early 1760s', in Nicholas Cronk (ed.), *Voltaire and the 1760s. Essays for John Renwick* (Oxford 2008), 145–158.

[13] Sarah Maza, *Private Lives and Public Affairs: The Causes Célèbres of Prerevolutionary France* (Berkeley 1993), 33.

[14] Roland Mousnier, *Les institutions de la France sous la monarchie absolue. 1598–1789* (Paris 1992), 2 vols., II: 251–258 and 391–399.

[15] Despite a request from the King's Council, the *Parlement* in Toulouse demanded the astronomical sum of 1500 livres from Mme. Calas to prepare and forward copies of the case

Aside from the tragic fate of the victims of injustice, Voltaire was committed to fighting the political and legal wrongs in France that were responsible for judicial murder in his view. The death sentence given to Jean Calas would never have been issued, let alone carried out, if the judges had not followed the procedures stipulated in the criminal code [Ordonnance criminelle] of 1670.[16] The Calas case was thus a dramatic demonstration of the weaknesses of French criminal law, in light of which the shortcomings of provincial judges were of secondary importance. Beginning with this blatant miscarriage of justice, Voltaire undertook a publicity campaign on behalf of fundamental legal reform in which he remained engaged until the end of his life.[17]

But the Calas affair revealed more than just the structural deficiencies of the French legal system. Indeed, it demonstrated in no uncertain terms the disastrous consequences of the discrimination and ostracism to which Protestants in France were subjected. The fact that the magistrates of the court of Toulouse were all too ready to believe that Marc-Antoine Calas had been murdered by his family was the result of massive prejudice against the members of this religious minority. The rumour circulated that Marc-Antoine had wanted to convert to Catholicism, and many Frenchmen did not doubt for a moment that it was normal for the Huguenots to kill apostate family members. Hatred of Calvinists came to a head in Toulouse in the form of a religious procession honouring Marc-Antoine Calas as a "martyr for the true faith"—the equivalent of condemning his father ahead of the court. Confronted with this glaring example of persecution and discrimination against French Huguenots, Voltaire—who previously had taken a critical and reserved stance with respect to Protestantism—joined the battle for the civil rights of Protestants and became the most prominent advocate for their cause.[18]

But Voltaire's engagement was by no means limited to combating the specific reasons for the wrongful execution of Jean Calas. He was concerned

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records. The court later refused to acknowledge or provide notification in its area of jurisdiction that the judgement had been overturned. D 12518, D 12522, D 12527 [D = Voltaire, *Correspondence and Related Documents*, ed. by Theodore Besterman (Geneva and Oxford 1968–1977), *OCV* vols. 85–135].

[16] On the legal aspects of the Calas case, see Bien 1960 (note 10), 92–115.

[17] Voltaire developed his ideas on comprehensive legal reform beginning with his *Histoire d'Elizabeth Canning et des Calas* (1762) and continuing with the *Commentaire sur le livre des délits et des peines* (1766) and the *Prix de la justice et de l'humanité* (1777). For further details on this aspect of Voltaire's thought, see Peter Gay, *Voltaire's Politics. The Poet as Realist* (Princeton 1959), 273–308.

[18] Graham Gargett, *Voltaire and Protestantism* (Oxford 1980), 250–374.

not only with reforming the criminal law and improving the lot of the Huguenots but also with the larger issue of implementing fundamental Enlightenment principles of religious tolerance.[19] The Calas affair, which touched on the fundamentals of human coexistence in Voltaire's view, thus took on a universal meaning. The condemnation of an innocent father on the basis of his professed belief was a sign of religious fanaticism and an especially poignant warning that tolerance had to be generally enforced.[20] This rhetorical argumentative connection is expressed with particular clarity in the title of Voltaire's famous *Traité sur la tolerance à l'occasion de la mort de Jean Calas*.[21] His strategic aim was thus to use the positive dynamic of the rehabilitation campaign to strike a fatal blow against the "hydra of fanaticism"[22] in a battle that did not come to an end with the conclusion of the Calas affair.[23]

Closely connected to this was Voltaire's wish that the successful conclusion of the Calas affair would help to bring about internal consolidation of the party of the *philosophes*[24] and, beyond this, give it a new position as the socially and politically dominant force in France (and all of Europe).[25] In this sense, the judicial process in Toulouse was to play an important role in setting the course in the battle for opinion leadership which the *parti philosophique* was waging against its enemies.[26]

Voltaire's engagement, which simultaneously consisted of such different objectives as the rehabilitation of victims, concrete legal reform in France,

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[19] On the construction of "cause" as a universal "interest" in the Calas affair that reached beyond concrete events, see Élisabeth Claverie, 'Procès, affaire, cause. Voltaire et l'innovation critique', *Politix. Travaux de science politique* 26 (1994), 76–85, 81–84.

[20] See D 11787, 10810, 10849 and 11009.

[21] On the complementarity of deducing the "universal interest" from a concrete case, on the one hand, and illustrating the general principle in the form of an individual victim, see Abrosimov 2007 (note 2), 188–191.

[22] John Renwick, 'Theory Becomes Action: Toleration from Calas (1762) to *Les Guèbres* (1768)', in Ulla Kölving and Christiane Mervaud (eds.), *Voltaire et ses combats. Actes du congrès international Oxford-Paris 1994* (Oxford 1997), 2 vols., I: 581–591.

[23] See, among others, D 10860, 11930, 12481, 12557, 12606 and 12497.

[24] See, among others, D 11699 and 11808.

[25] Thus Voltaire affirmed in a letter to d'Alembert of 1 March 1764: "Cette tolérance est une affaire d'état, et il est certain que ceux qui sont à la tête du royaume sont plus tolérants qu'on ne l'a jamais été; . . . Les premières places seront un jour occupées par des philosophes; le règne de la raison se prépare; il ne tient qu'à vous d'avancer ces beaux jours, et de faire mûrir les fruits des arbres que vous avez plantés." D 11738. See also D 13559.

[26] Thus Voltaire stated in a letter to Damilaville of 15 March 1765, in which he summed up the Calas affair: "Ce sera une belle époque pour la philosophie qu'elle seule ait secouru ceux qui expiraient sous la glaive du fanatisme. Remarquez, mon cher frère, qu'il n'y a pas un seul prêtre qui ait aidé les Calas." D 12462. See also D 12500, 12425 and 12468.

defence and propagation of universal values, and strengthening the party of the Enlightenment, could only bear fruit because he succeeded in identifying and including in his campaign different groups of actors who were to play a decisive role in the Calas affair. Seen in retrospect, it is possible to reconstruct three audiences to which he directed his persuasive efforts. In addition to the Court of Versailles and high-level decision-makers in the government, Voltaire also appealed to the French and Parisian public, on the one hand, and the European public, on the other. In the latter case, representatives of the ruling elite were of paramount importance.

Aside from these actors, who needed to be convinced in the first place, Voltaire succeeded in mobilising two groups whom he could count from the beginning as "natural" allies in the Calas affair and without whose full logistic support he would not likely have been able to organise a pan-European campaign from his remote location in Ferney. One of these was the internationally active Huguenot network centred in Geneva, which entered into a spirited and multifaceted cooperative relationship with Voltaire.[27] Another was the *parti philosophique*, which supported its "leader" without reservation, although discretely, in his campaign.[28]

In addressing himself to so many parties which had little in common in terms of specific group interests and patterns of thought and which, with the exception of the *philosophes*, did not share all of his basic convictions and strategic aims, Voltaire risked alienating important discussion partners or committed comrades-in-arms with every statement he made. He benefited, for example, from the support of the Huguenots, who not only provided him with information about events in Toulouse that was difficult to obtain[29] but also contributed the arguments for the propagation of religious tolerance.[30] Nevertheless, by nature his Calvinist partners did not share Voltaire's fundamental conviction that establishing the principle of tolerance was only possible on the basis of religious indifference.[31] This latent dissent led to open discord, at the latest

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[27] Claude Lauriol, 'L'affaire Calas vue du côté des calvinistes', in François Bessire and Sylvain Menant (eds.), *Traité sur la tolérance de Voltaire* (Paris 1999), 32–40.

[28] Frank A. Kafker, 'Were the Encyclopedists Allies of Voltaire in the Callas Affair?', in Kölving and Mervaud 1997 (note 22), II: 849–856; id., 'Le rôle de Diderot dans l'affaire Calas', *Recherches sur Diderot et sur l'Encyclopédie* 21 (1996), 7–13.

[29] Robert Granderoute, 'De la source au texte: les mémoires voltairiens de l'affaire Calas', in Kölving and Mervaud 1997 (note 22), I: 567–579.

[30] Anne-Marie Mercier-Faivre, 'Le *Traité sur la tolérance*, tolérance et réécriture', in Nicholas Cronk (ed.), *Etudes sur le* Traité sur la tolérance *de Voltaire* (Oxford 2000), 34–55.

[31] See, among others, D 11590, 11695, 11702 and 11718.

following publication of the *Traité sur la tolérance*.[32] That such potential conflicts did not surface more frequently and cripple the rehabilitation campaign was due to the fact that Voltaire's communication practices eluded the principle—constitutive of the public sphere—of simultaneity of all acts of communication. On the contrary, his statements in the context of the Calas affair were characterised by targeted use of argument depending on the specific group addressed, and even the development of mutually exclusive linguistic codes.

Thus, taking account of the decision-making processes in Versailles, Voltaire was forced to exercise great restraint when it came to naming those responsible for the judicial murder of Jean Calas—not only in his letters to representatives of the French ruling elite, but also in all of his public statements. In no instance did he openly criticise the religious policies of the French government; he even refrained from personally attacking the members of the *Parlement* in Toulouse, characterising them instead as victims of public pressure and gross disinformation.[33] He thus assigned the main responsibility for the crime to the fanaticised mob [multitude insensée] in Toulouse, whose anti-Protestant agitation had made a fair process impossible.[34]

By contrast, in his letters to the Parisian *philosophes* and to trusted individuals, members of the so-called *comité calviniste* in Geneva,[35] Voltaire freely expressed his deep contempt for the judges in Toulouse, whom he described as "murderers in black robes".[36] In these letters, he also denounced the Calas affair as a genuine mark of shame for France, for which he blamed not only the local perpetrators but the entire nation, including its political leadership. For Voltaire, the judicial murder in Toulouse even seemed to have a significant connection to the French defeat in the Seven Years' War, in terms of the political and cultural decline of a once dominant power in Europe: "We are an odious, intolerant and superstitious nation, both atrocious and frivolous, a nation that readily turns

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[32] Lauriol 1999 (note 27), 37–39.

[33] See, for example, 'Lettre de Donat Calas': "On plaindra les juges de n'avoir point vu par leurs yeux dans une affaire si importante, et de s'en être rapportés à l'ignorance." *OCV*, vol. 56b, 173.

[34] Voltaire, 'Traité sur la tolérance', in *OCV,* vol. 56c, 131–133.

[35] In addition to the merchants Philippe Debrus and Henri Cathala, this group also included the attorney Charles de Végobre, the pastor Paul-Claude Moultou, and the renowned physician Théodore Tronchin.

[36] "assassins en robe noire". D 11040. See also the characterisation of the judges of Toulouse as "visigoths", a topos that was intended to underscore their barbarism. D 11121, 12511 and 13551.

from St. Barthélemy to the comic opera, that is capable of breaking its innocents on the wheel and that is incapable of combat either at sea or on land."[37]

The apparent contradictions between these different analyses and assessments of the events in Toulouse make it clear that Voltaire's statements were tailored to specific audiences and that they could have an effect in the respective segments of the public to which they were meant to appeal only under the condition of separate communicative spaces.

The fatal consequences of transcending such boundaries were illustrated by the unauthorised publication in the English press of a letter of 29 March 1762 from Voltaire to d'Alembert.[38] A grossly distorted version of this letter, in which Voltaire's original critical remarks about the French government had been considerably exaggerated, was published in the "Saint James Chronicle" in London in July 1762.[39] This caused considerable irritation in Versailles, among others to the Duke of Choiseul—the most influential member of the cabinet, with whom Voltaire was usually on good terms.[40] Only by summoning his full powers of persuasion was Voltaire eventually able to mollify the court and the Duke personally, thereby rescuing the campaign to rehabilitate the Calas family from premature failure.[41] Even though in this case the scandal was caused primarily by the falsified passages, the transmittal of Voltaire's remarks from the communicative space of private correspondence with like-minded individuals to the public forum of the international press already proved to be a substantial threat to the success of his intellectual engagement.

Communication Strategies

Voltaire, however did not content himself with the simple pragmatism of adhering to the different linguistic codes tailored to specific addressees and keeping the respective communication channels separate. Rather, in the course of his long-lasting engagement on behalf of the victims of

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[37] "nous sommes une nation odieuse, intolérante, superstitieuse, aussi atroce que frivole, qui passe de St. Barthélemy à l'opéra comique, qui sait rouer des innocents, et qui ne sait combattre ny sur mer ny sur terre." D 10391. See also D 10394.

[38] D 10394.

[39] Geneviève Menant-Artigas, 'Cassandre et Calas. Une nouvelle version de la lettre de Voltaire à d'Alembert', *Dix-huitième Siècle* 16 (1984), 297–311.

[40] D 10752.

[41] See, among others, D 10661, 10680, 10754, 10757–58, 10764, 10768, 10771, 10786, 10790, 10794 and 10800.

injustice, he developed three complementary communication strategies that were ultimately to balance and reinforce each other. Each of these strategies focused on one of the three groups that he hoped to win over to his cause: the French court, the Parisian public, and enlightened Europe [Europe éclairé]. The different approaches were based on the heterogeneous, unwritten rules of communication pertaining to these spatially and socially distinct segments of the public sphere and whose functional logic Voltaire understood precisely and applied with virtuosity. Moreover, in the long term, each of these communication strategies was meant to be of help in transcending the boundaries of the original action space and expanding communication into other segments of the public sphere, thereby paving the way for universal application of Enlightenment principles.

"La grande faveur"

Voltaire's most important strategy in the context of the Calas affair was aimed primarily at the centre of power. In addition to classic letters of petition to the king and the chancellor, which he wrote in the name of the victims,[42] he made informal attempts to persuade influential persons in the immediate circle of King Louis XV to become advocates of his cause and also tried to influence government decision-makers [gens en place] with the aim of seeing the legal proceedings reopened and ultimately achieving acquittal. Voltaire expected to obtain the best results from gaining high-level protection [la grande faveur] of this sort.[43] For this purpose, he took up private correspondence with exposed representatives of court circles at Versailles with whom he had good, longstanding relations, including the Duke of Choiseul, Cardinal de Bernis and Marshal de Richelieu.

The intimate tone of these letters, with their numerous allusions, inside jokes and, in the case of Choiseul, the mutual use of a nickname "ma marmotte" as a term of endearment, bear witness to Voltaire's perfect mastery of the art of enlisting support from patrons in high places. The contemporary linguistic code of the aristocratic sociability prohibited making explicit the asymmetrical patronage relationship between a "powerful

[42] See 'Requête au roi', 'A Monseigneur le Chancelier' and 'Requête au roi en son conseil', in *OCV*, vol. 56b, 177–189 and 275–278.

[43] "Nous n'obtiendrons qu'une pitié impuissante si nous n'avons pas la plus grande faveur." D 10586.

individual" [grand] and a man of letters [homme de letters], and required that the relationship be described as an intimate friendship.[44]

A further characteristic of this correspondence is the nonchalant manner in which Voltaire presented his concerns, continuously alternating between the tragedy of Toulouse and the banalities of everyday life. He did not shrink from making light of the fate of Jean Calas, whom he frequently referred to somewhat casually as "mon roué".[45] This was not a sign of cynicism but application of the code of mundane conversation, which did not allow for references to overly serious matters and placed great value on sudden alternation between subjects under discussion and stylistic levels.[46] By skilfully employing the norms of expression that prevailed in the royal and aristocratic communicative space, Voltaire succeeded in winning over many powerful individuals to his cause.

In addition to contacts by letter, Voltaire also called upon many intermediaries who supported his cause by personally interceding with *gens en place*. Thus, for example, Voltaire's comrade from school days, the Count of Argental, was regularly asked to convey messages to Choiseul, with whom he maintained close contact.[47] This strategic use of brokers who, although they could not guarantee protection on their own authority, nonetheless invested their own social capital in his cause, was evidence of Voltaire's confident command of the traditional rules of patronage that were still fully applicable in the court context.[48]

Despite its specific orientation towards Versailles, this strategy of Voltaire aimed for a further-reaching goal that was best characterised in his own words: "One must always begin by having the majority enlightened by the minority." This statement, which was made in the context of the *Traité sur la tolérance*,[49] is illustrated in an almost ideal-typical fashion by the complex publication history of this work.[50]

In the first phase (October 1763–March 1764), with the exception of the Parisian *philosophes*, circulation of the treatise was limited to a small

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[44] Antoine Lilti, *Le Monde des salons. Sociabilité et mondanité à Paris au XVIII^e siècle* (Paris 2005), 169–186.

[45] Jutta Lietz, 'Voltaires Korrespondenz zur Affäre Calas', *Romanistisches Jahrbuch* 49 (1998), 68–97: 85–89.

[46] Lilti 2005 (note 44), 273–287.

[47] See D 10389, 10493, 10691 and others.

[48] Sharon Kettering, *Patrons, Brokers and Clients in Seventeenth-Century France* (New York 1986), 56f.

[49] "Il faut toujours commencer par faire éclairer le grand nombre par le petit". D 11747.

[50] François Bessire, 'Rédaction et diffusion du *Traité sur la tolérance*: les enseignements de la correspondance', in Bessire and Menant 1999 (note 27), 41–50.

circle of the leading figures of France [premières personnes de France].[51] Among these, in addition to Mme. de Pompadour, were Chancellor Lamoignon, the dukes of Praslin and Choiseul, as well as other high office holders and representatives of the upper aristocracy such as the Prince of Soubise, the Duke of La Vallière, and the duchesses of Grammont and Anville, who had considerable influence at the royal court.[52]

There were a number of reasons for the resounding success[53] of this strategy of limited circulation, all of which can be traced to the skilful transformation of the book as a mass medium into the medium of exclusive, personalised communication. The discrete delivery of a printed work that was not authorised in France, and in some cases was even confiscated by the postal service,[54] was a basis for "complicity" between an author and his readers; this lent a special aura of the forbidden to reading the *Traité*. Moreover, the purposeful exclusion of the general public[55] gave those who received advance copies the impression of belonging to an "exclusive circle"[56] and reinforced their perception of themselves as the nation's intellectual elite. In this context, the Enlightenment message of the *Traité* became a sign of distinction: sharing Voltaire's views, or having shared them from the beginning, promised to enhance one's reputation.[57] Finally, the book, which in this respect functioned as an exclusive "gift", forged a relationship of exchange between the author and his privileged readers and obligated them to return the favour.[58] This return favour, in Voltaire's view, was to consist, on the one hand, of active commitment to a positive outcome in the campaign to reverse the judgement in the Calas

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[51] Voltaire had already tested this exclusive publication strategy in the summer of 1762 on his brochures on the Calas affair (the so-called *Pièces originales*), although at that time there were substantially fewer addressees among the representatives of the French ruling elite. See D 10551, 10552 and 10597.

[52] See, among others, D 11043, 11140, 11148, 11586, 11597, 11663 and 11696.

[53] See D 11549 and 11568.

[54] See D 11549, 11597, 11598 and 11663.

[55] "J'accompagnerais l'envoy d'une Lettre circulaire, par laquelle je les suplierais de ne laisser lire l'ouvrage qu'à des personnes sages, et d'empêcher que leur exemplaire ne tombât entre les mains d'un libraire." D 11148.

[56] "Quant au traitté véritable de la tolérance, ce sera un secrêt entre les adeptes." D 11134.

[57] See in particular Choiseul's reaction in his letter to Voltaire of 27 November 1763: "Madame de Pompadour, madame de Gramont, tous ceux qui ont lu, ou liront le livre de votre prêtre, en ont été enchantés; *chacun se dit après l'avoir lu: il faut convenir qu'il a raison, et j'ai toujours pensé de même*." D 11518 [emphasis by K.A.].

[58] The obligating character of such a "gift" was clear *ex negativo* from the attitude of Cardinal Bernis, who was not prepared to involve himself in the Calas affair and who consequently refused to accept the *Traité sur la tolérance*. See D 11650 and 11662.

case. On the other hand, Voltaire also expected the concept of religious tolerance to be implemented in specific government activities over the long term.[59]

For Voltaire, the phase of exclusive circulation of the *Traité* was the necessary preliminary step towards its subsequent appearance on the public book market. The support of "highly placed sponsors" was primarily a form of protection against anticipated attacks from anti-Enlightenment forces and against calls for a ban on the text. It was in this respect that Voltaire expressed his hope to the Count of Argental: "If mad.[ame] de Pompadour is satisfied with it, if the messieurs the dukes of Choiseul and Praslin express their approval, and if M. le m[arqu]is de Chauvelin adds his enthusiasm to yours, who will be able to prohibit a book that teaches nothing but virtue?"[60]

Aside from the benefit of protection, the influence of his privileged readers on the process of public opinion formation was also of great importance to Voltaire. Their judgement was meant to serve as an authoritative precursor to reception by the general public.[61] Indeed, from Voltaire's perspective, the great majority of people—hardly open to rational arguments and universal principles of reason[62]—were likely to be rid of their ingrained prejudices only if the enlightened ruling elite took the lead and guided them accordingly.[63] For Voltaire, the gradual winning over of those at the top of the social hierarchy was thus the decisive prerequisite for establishing the hegemony of the enlightened ideas he was seeking to promote among the French public. It should be noted that, according to

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[59] "J'ose supposer qu'un ministre éclairé et magnanime, un prélat humain et sage, un prince qui sait que son intérêt consiste dans le grand nombre des sujets, et sa gloire dans leur bonheur, daigne jeter les yeux sur cet écrit informe et défectueux . . . il se dit à lui-même: que risquerai-je à voir la terre cultivée et ornée par plus de mains laborieuses, les tributs augmentés, l'Etat plus florissant?" 'Traité sur la tolérance', in *OCV*, vol. 56c, 154.

[60] "quand mad.[ame] de Pompadour en est satisfaite, quand messieurs les ducs de Choiseul et de Praslin témoignent leur approbation, quand M. le m[arqu]is de Chauvelin joint son enthousiasme au vôtre, qui donc peut proscrire un livre qui ne peut enseigner que la vertu?" D 11663.

[61] See, among others, D 11523, 11528, 11568, 11696 and 11699.

[62] Thus he wrote, in connection with the *Traité sur la tolérance*: "Il y a des viandes que l'estomach du peuple ne peut pas digérer, et qu'il ne faut servir qu'aux honnêtes gens." D 11134.

[63] "Le roi de Prusse mande que sur mille hommes on ne trouve qu'un philosophe; mais il excepte l'Angleterre. A ce compte il n'y aurait guère que deux mille sages en France; mais ces deux mille en dix ans produisent quarante mille et c'est à peu près tout ce qu'il faut, car il est à propos que le peuple soit guidé, et non pas qu'il soit instruit." D 13212. See also D 11577.

his concept, the French public sphere as a discursive space was certainly not free from power relations.

"Le cri public"

In addition to the strategy based on mobilisation of the ruling elite by means of exclusive communication, Voltaire developed a further, somewhat contradictory procedure of intellectual engagement in the Calas affair. Especially at the start of the campaign (July–September 1762), when the issue was overcoming the initial disinterest of decision-makers in Versailles[64] and forcing a reopening of the Calas case, Voltaire made creation of public opinion in favour of the Calas family his highest priority.[65] On analysis, two complementary procedures can be distinguished in this regard. On the level of concrete communication practices, Voltaire sought to use the power of the spoken and written word to affect representatives of Parisian "society" [bonne compagnie] as well as the general public, in order to arouse shock and indignation about the judicial murder in Toulouse and thereby put pressure on the authorities in Versailles. At the level of discourse, the aim was to elevate a potentially universal but completely powerless collective subject—the "public"—to the role of decisive actor in this politico-legal debate.

In order to reach the Parisian public, Voltaire availed himself of several media, using their specific mechanisms with skill to promote the success of his campaign. Thus, in addition to strictly confidential statements, Voltaire's letters to his Parisian friends—including d'Alembert, Damilaville and d'Argental—also contained information or evaluations that were intended for the widest possible distribution among Parisian society. Some letters even had a semi-public character, as they were intended to be read out completely or in part to different groups in society. Those to whom such letters were addressed were meant to have a multiplying effect—initiating a process of oral communication, starting in their own social circle and expanding in a concentric structure—which Voltaire

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[64] For the initially reserved to negative reactions of Cardinal de Bernis, the Duke of Villars and the Duke of Choiseul in their correspondence with Voltaire, see, among others, D 10455, 10565 and 10752.

[65] See letter from Voltaire to Philippe Debrus, 29 June 1762: "Je vois évidement que l'affaire traînera à Paris, et qu'elle s'évanouira dans les délais. Le chancelier est vieux. La cour est toujours bien tiède sur les malheurs des particuliers. … Nous sommes perdus si l'infortunée veuve [Mme Calas] n'est pas portée au roy sur les bras du public attendri." D 10538.

expressed precisely with his motto "Criez, et qu'on crie" [Cry out, and let everyone cry out].[66]

Voltaire sought in this manner to familiarise the public in the French capital with his version of the Calas family tragedy, and to undermine the rumours purposely disseminated by the *Parlement* of Toulouse to justify its own decision in the case.[67] Exchanges of letters also functioned as one of the most important media in Voltaire's information policy in the latter part of the campaign, when they were used, for example, to help integrate his "official" statements concerning the central message of the *Traité sur la tolérance* into public discussion in Paris.[68] That this communication channel proved effective can be attributed to the fact that statements made by a literary figure as famous as Voltaire in letters not intended for publication were accorded great value in the symbolic economy of the Parisian salons. To be able to read from or at least to quote second hand from a letter by Voltaire promised a salon visitor the undivided attention of everyone present and thus an enhancement of reputation.[69] It was thanks to this incentive, which Voltaire deliberately included in his calculations, that rapid dissemination of the messages contained in his letters was ensured among the Parisian public.

Concurrent with targeted application of the rules of oral and manuscript communication in Parisian society, Voltaire also attempted to reach the general reading public through numerous printed publications. Thus he published a series of texts in the form of letters from individual members of the Calas family, under the title *Pièces originales concernant la mort des sieurs Calas et le jugement rendu à Toulouse*. In these letters, Voltaire mainly attempted to relate the family's tragic fate in emotional terms in order to communicate their innocence to the public. This "emotional technique",[70]

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66 D 10567.

67 The initial great effectiveness of the "public relations" efforts made by the members of the *Parlement* of Toulouse in Paris is evident, for example, in statements by La Condamine, a natural scientist and member of the Academy of Sciences in Paris who take a great interest in the affair. See Hubert Bost and Claude Lauriol, 'L'affaire Calas d'après les lettres de La Condamine à La Beaumelle', in Cronk 2000 (note 30), 68–84 and in particular 70–73.

68 See letter from Voltaire to Damilaville, 13 February 1764: "Mon cher frère, j'ai des nouvelles assez satisfaisantes sur la Tolérance. On souhaite d'abord que vous en donniez quelques exemplaires à des personnes qui les trompetteront dans le monde, comme un ouvrage honnête, religieux, humain, utile, capable de faire du bien, et qui ne peut faire de mal." D 11696.

69 Lilti 2005 (note 44), 290–293.

70 The desired public reactions were "pitié", "attendrissement" and "larmes". See, among others, D 10538, 10551, 10559, 10566, 10567, 10571 and 10573.

to which Voltaire gave preference over reasoning and argumentation,[71] was based on calculations of its aesthetic effect. The psychological realism evoked by the individual voices of the widow, Anne-Rose Calas, and her two sons Donat and Pierre, was meant to convey not only a convincing portrait of a virtuous, simple and tolerant family but also to arouse public sympathy and the kind of empathic response familiar to readers of contemporary epistolary novels.[72]

Sensitivity (or lack of it) to the suffering of the victims of the judicial process simultaneously became a moral test case whereby any doubt or criticism of Voltaire's statements amounted to an ethical discrediting of the critic and accordingly became taboo. Thus the arch-enemy of the *philosophes* and publisher of the *Année littéraire*, Elie-Catherine Fréron, who had made sceptical comments about the logic of Voltaire's argumentation in relation to the innocence of Calas,[73] was castigated by Voltaire and his defenders as a "barbarian" totally incapable of empathy.[74] Such reckoning with the "wretched criticaster" illustrates that the winning over of public opinion in relation to the Calas affair was not done primarily in a mode of critical reasoning but in many instances explicitly excluded this mode.[75]

In addition to generating sympathy, Voltaire's publications focused on ridiculing the blind fervour of religious fanatics.[76] Thus, especially in the

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[71] This was relegated to the annotations. See Robert Granderoute, 'Les notes des opuscules en faveur de la justice, des Mémoires des Calas au Prix de la justice et de l'humanité', in Nicholas Cronk and Christiane Mervaud (eds.), *Les notes de Voltaire. Une écriture polyphonique* (Oxford 2003), 338–349, in particular 345–348.

[72] Nicholas Wagner, 'Voltaire, poète des Lumières. L'affaire Calas', in Jean Ehrard (ed.), *Etudes sur le XVIII^e siècle* (Clermont-Ferrand 1979), 163–173.

[73] *Année littéraire* (1765), Lettre VI, III: 145–163.

[74] See D 12848 and also Grimm's *Correspondance littéraire* of 1 October 1765: "il faut être le dernier des hommes pour oser attaquer l'innocence d'une famille si cruellement opprimée, simplement parce qu'elle compte parmi ses défenseurs un homme qu'on a intérêt de décrier. . . . La réponse de M. de Voltaire à M. d'Argence . . . n'est pas moins terrible pour le célèbre folliculaire. Le mot, 'je sais bien qu'il n'en aurait pas été touché', est un des plus cruels qu'on ait jamais dits d'un bandit." *Correspondance littéraire philosophique et critique*, ed. by Maurice Tourneux (Paris 1877–1882), 16 vols., VI: 379f.

[75] See the comments on Fréron's attack in *Mémoires secrets* of 15 May 1765, where the questioning of the logic of Voltaire's argumentation is declared a pedantic quibble: "Quelque peu raisonné que fût son [Voltaire's] zèle, il ne lui fait que plus d'honneur. Les vrais philosophes sauront très mauvais gré à Fréron d'avoir mis sous le nom d'un autre philosophe toutes les mauvaises chicanes, tous les raisonnements scolastiques qu'il emploie pour prouver que M. de Voltaire a eu tort." *Mémoires secrets pour servir à l'histoire de la République des lettres en France, depuis 1762 jusqu'à nos jours etc.* (reprint of London 1780 edn., Farnborough 1970), II: 194.

[76] See 'Mémoire de Donat Calas', in *OCV*, vol. 56b, 311f. and Voltaire's own commentary: D 10616.

Traité sur la tolérance, which became available to the general reading public following its phase of exclusive availability, historical-theological argumentation was "seasoned" with the use of satire and mockery, designed to amuse the reader.[77] Voltaire was aware that he was breaking with the established conventions of the learned treatise in the process.[78] In using this form of presentation, Voltaire was drawing on the pamphlets he had produced since the 1750s in the context of numerous conflicts and polemic exchanges between the *philosophes* and the representatives of the Counter-Enlightenment. These brochures were less concerned with persuading the public or his opponents than with exposing the latter through grotesque exaggeration and ridicule.[79] Accordingly, the *Traité* was also meant to portray religious intolerance not only as irrational and damaging but also as absurd, barbaric and vulgar.

Despite the differences between the satirical and the emotional styles of expression,[80] Voltaire's public relations strategy—by radical contrast with his exclusive strategy of persuading the ruling elite—was aimed at a socially heterogeneous and basically inclusive public, as his comment on the *Traité sur la tolérance* made very clear: "One must be very brief and somewhat sharp, otherwise the ministers and mad[am]e de Pompadour, the clerks and the chambermaids will use the book's pages to make curls in their hair".[81] In his practical efforts to make his writing universally available, Voltaire relied on the economic laws of the book market, where unauthorised works in particular were reprinted illegally immediately after their initial publication, based on the great public interest they aroused.[82] The expanded concept of the public thus made the use of printed books meaningful and necessary; vice-versa, this medium of dissemination offered the opportunity of reaching a new target audience for

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[77] See, among others, D 10885 and 10897.

[78] Sylvain Menant, 'Le titre et le genre du *Traité sur la tolérance*', in Cronk 2000 (note 30), 136–149.

[79] Ferret 2007 (note 7), 243–363.

[80] This deliberately practiced stylistic pluralism also aroused criticism from his own camp. See Grimm's comments on the *Traité sur la tolérance*: "la plaisanterie n'est nulle part plus déplacée que dans un plaidoyer de la cause du genre humain contre la cruauté du fanatisme et de l'hypocrisie. Quand on regarde le tableau des horreurs et des crimes qui ont résulté de quelques mots qui n'ont point de sens, on frémit et l'on n'a pas envie de rire." Tourneux 1877–1882 (note 74), V: 422. See also D 10697.

[81] "il faut être très court, et un peu salé, sans quoi les ministres et mad[am]e de Pompadour, les Commis et les femmes de Chambre, font les papillotes du livre." D 10885. Voltaire's model for arousing concern was also programmed for universal effect. D 11087.

[82] On the success of Voltaire's writings on the Calas affair in the book market, see *OCV*, vol. 56b, 134–145 and 340–344 as well as ibid., vol. 56c, 98–115.

Voltaire's intellectual engagement—the anonymous public that existed beyond all conventional social categories.

All in all, Voltaire's complementary use of written, oral and print media in the context of this communication strategy was focused on one objective: eliciting the "cri public". This strategy would make it possible for Voltaire's voice to be magnified in the arena of public communication to become the collective voice of the public. The next step would be for the Parisian public, accordingly in tune with his views, to help win over Versailles to the cause of rehabilitating the Calas family. "My idea is that we arouse the public by printing the letters from the mother and the son . . . and that public outcry will force the chancellor to intercede with royal authority."[83]

Despite its structural potentiality,[84] the construct of "public opinion" was by no means an empty phrase. Rather, with respect to the Calas affair, it proved to be a *generally believed fiction* that exercised great pressure to conform on all actors and that was also taken into account during decision-making by those in power, as Mme. de Pompadour admitted, for example, in a letter to Duke Fitz-James: "The news of this extraordinary affair has brought suffering to the good-hearted king and all France cries out for vengeance."[85]

But the strategy of mobilising public opinion developed by Voltaire during the Calas affair was not necessarily fixed on making demands from advocates of the Enlightenment heard by the responsible authorities. Rather, in divergence with Voltaire's own beliefs, it became a central element in political radicalisation, at the latest during the Maupeou crisis in the early 1770s.[86] A new orientation of this communication strategy along such lines was possible because Voltaire had already linked it with the concept of the "tribunal du public".[87] In his view, the judgements rendered by this "court" had greater validity than those rendered by the responsible authorities: "The memory of Calas will be restored in the public

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[83] "Mon avis est qu'on touche le public par impression de la lettre de la mère et du fils . . . et que le cri public force le chancelier à interposer l'autorité royale." D 10554. See also D 10538, 10566 and 10571.

[84] Hanrahan 2008 (note 12), 154–157.

[85] "Le bon cœur du Roi a bien souffert au récit de cette étrange aventure et toute la France crie vengeance." D 10677. See also D 10582, 10597, 10607 and 10675.

[86] The "mémoires judiciares", which played an important role here, were modelled on Voltaire's writings regarding the Calas affair, not only in their appeal to the public but also in the fictional writing strategies employed in them. See Maza 1993 (note 13), 27–67.

[87] D 13118.

mind, and that will be the true rehabilitation; the public will condemn the judges, and the public's judgement is worth a judgement by the council."[88] From this developed the vision of the public as a universal and autonomous court free of particular limitations that would always reach the right decision, thus proving itself morally superior to established powers.[89] Against this background, the version of intellectual communication practices devised by Voltaire takes on the appearance of a self-empowerment strategy of the *philosophes*, who played the role of prosecutors before the public tribunal and thus ultimately called into question the state's claim on the exercise of power.

However, the familiar picture of confrontation between the state on the one hand and the party of the Enlightenment as the spokesmen for a critical public on the other hand must be relativised, at least with respect to Voltaire. The tendency to elevate the public to an unassailable intellectual and moral authority was counterbalanced in his case by an empirical-functional view of the public that was free of any idealisation. In particular, by comparison with the abstractly affirmative concept of *opinion publique* held by other French theoreticians, Voltaire saw public opinion as having the traditional characteristics of opinion in general: error, arbitrariness and vicissitude.[90]

According to this point of view, Voltaire lamented the generally widespread religious intolerance among the French, which he was forced to respect in his writings about the Calas affair in the hope of success in the rehabilitation campaign. The basic attitudes of the reading public seemed to pose an even greater obstacle to him than the pressure of state censorship where open development of his critical views was concerned, and forced him to conduct two types of discourse.[91]

At the same time, Voltaire realised how quickly the Parisian public could grow weary of a particular topic. Thus, in his view, the lack of interest on the part of the French public in the fate of the Sirven family, Huguenots who were also innocent and wrongly condemned, was the inevitable consequence of exhausted enthusiasm for the victims of intolerance in

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[88] "la mémoire de Calas sera rétablie dans l'esprit du public, et c'est la vraie réhabilitation; le public condamnera les juges, et un arrêt du public vaut un arrêt du conseil." D 10586. See also D 10606, 10679 and 13540.

[89] "C'est le public que je prends toujours pour juge. Il se trompe quelquefois au théâtre et ce n'est que pour un temps; mais dans les affaires qui intéressent la société, il prend toujours le bon parti." D 13348. "Ce n'est pas le pouvoir qui flétri, c'est le public." D app. 291.

[90] See, among others, Ozouf 1987 (note 6).

[91] See D 10613, 10616, 10885, 10930 and 10946.

the aftermath of the Calas affair.[92] Under such conditions, the *philosophes* were very limited in terms of the agenda they could set, as public interest for every concern would quickly wane before the desired permanent effect could be achieved. Voltaire believed that this "fickle" and "erratic" character in particular among the Parisian public was rooted in its continual quest for new amusement. For Voltaire, this craze for amusement was synonymous with the *opéra comique*[93] which, as an advocate of classical theatre aesthetics, he considered to be the very definition of shallow and ephemeral entertainment.

In order to succeed in the arena of public communication despite such unfavourable basic conditions, an intellectual in Voltaire's view did primarily need to offer better arguments but above all had to adapt his action to the economy of public attention adequately.[94] Accordingly, Voltaire determined the moment for the first Parisian publication of his writings on the Calas affair as precisely as possible.[95] Only by taking exact account of all the topics which were currently appealing to the public interest was it possible to eliminate potentially counterproductive factors, such as competition for attention between different victims,[96] and above all to avoid sensory overload among the reading public. For this reason, Voltaire argued for a later publication date for the *Traité sur la tolérance*: "It is a dish that should only be served once people are hungry. The French are currently fed up with pastoral letters, remonstrances and comic opera. Time must be allowed for their indigestion to subside."[97] Voltaire's concrete practice of generating the "cri publique" was thus less based on the idea of public

[92] "J'attends tous les jours à Toulouse la copie authentique de l'arrêt qui condamne toute la famille Sirven . . . arrêt contre lequel tout le public se soulèverait avec indignation si les Calas ne s'étaient pas emparés de toute sa pitié. . . . Il n'y a que le zèle de m. de Beaumont qui soit inépuisable; le public se lasse bien vite d'être généreux." D 12511.

[93] See D 10387, 10391, 10392, 10407, 10421, 10439 and 10493.

[94] See, for example, D 12644: "Il ne faut pas laisser refroidir le chaleur du public. Il oublie vite, et il passe aisément du procèz des Calas à un opéra comique."

[95] See D 10550, 10567, 10585, 10607, 11656, 11664, 11696 and 11727.

[96] Until the definitive rehabilitation of the Calas family, Voltaire sought to avoid any mixing of this issue with the Sirven case, and therefore prevented the distribution in France of the *Toulousaines* by Court de Gébelin with the help of his Huguenot network. See, among others, D 11097. After the Calas family were rehabilitated he devoted all his energy to the Sirven case and explicitly called upon his friends in Paris to abandon the Calas affair and focus on the Sirvens. D 12618 and 12623.

[97] "c'est un mets qu'il ne faut présenter que quand on aura faim. Les Français ont actuellement l'estomac surchargé de mandements, de remontrances et d'opéras comiques. Il faut laisser passer leur indigestion." D 11664.

opinion as the high court of reason and morality than on a sceptical vision of the public as an object of influence and manipulation.

"L'Europe a jugé"

In addition to persuading the national public, *internationalisation* of the Calas affair was the third communication option at Voltaire's disposal. For this purpose, he elevated "Europe" to the highest court of appeal in the intellectual engagement of the *philosophes*. Just as the necessary impartiality in assessing a scholar or his works in the *République des lettres* was assured only by distance in time and space,[98] the authority of the European public, according to Voltaire, was based on distance from the constellation of interests in France as well as on its virtual character. These two factors prevented any self-interest that could distort objectivity: "I await calmly the judgement to be rendered [by the Conseil d'Etat], for, thank God, Europe has already passed judgement and I know that the only infallible tribunal consists of all decent and like-minded people from different countries. Without knowing it, they form a corps that cannot err because they have no *esprit de corps*."[99] European public opinion thus constituted a radical counterpoint to the *esprit du corps* of the *Parlement* in Toulouse as well as to the particular and prejudiced *opinion populaire* in Toulouse, to which Voltaire ascribed the primary responsibility for the judicial murder.[100]

The appeal to the European public in the context of the Calas affair was accompanied by a specific *external view* on the situation in France, which functioned as a form of self-empowerment of the *philosophes* with respect to their fundamental criticism of French conditions. Voltaire's special situation in Ferney—geographically at the periphery of France and simultaneously at the centre of a European social network of correspondents who exchanged letters—lent great plausibility to this strategy.[101] Contrary to established European symbolic topography, Voltaire set up a polarity between the enlightened and civilised "North" and France, which was

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[98] See, for example, Jean le Rond d'Alembert, 'Essai sur la société des gens de lettres et des grands, sur la réputation, sur les mécènes, et sur les récompenses littéraires [1759]', in id., *Oeuvres complètes* (Paris 1821–1822), 5 vols., IV: 352.

[99] "J'attends tranquillement le jugement [des *Conseil d'État*] qu'on rendra, car dieu merci, l'Europe a déjà jugé, et je ne connais de tribunal infaillible que celui de tous les honnêtes gens de différents pays qui pensent de même. Ils composent sans le savoir un corps qui ne peut errer, parce qu'ils n'ont pas l'esprit du corps." D 10980.

[100] Veysman 2004 (note 9), 358–362.

[101] D 10404.

sinking further into intellectual and moral neglect.[102] Voltaire's term "les Welches", which described barbaric, unenlightened France with a derogatory foreign expression derived from German, summarised this strategy in terms of a concise formula.[103] This denigration of France by contrast with the "enlightened North" appealed to the fears of the French elites about their loss of reputation on the European stage and was intended to motivate their active support for the *bonne cause*.

Despite the strategic significance of the European public as an orientation space for Voltaire's campaign, it is striking that although he was pleased with the rapid dissemination of his writings in Europe, he took no particular measures to address the wider European public. Rather, he was able to rely on his European-wide reputation as a writer, which alone was sufficient to ensure that his writings on the Calas affair would be reprinted abroad, translated into different languages, and reviewed in numerous periodicals. Supported by the dynamics of the literary market, the Calas affair thus became a European media event, although in some countries other factors such as religious solidarity with the Huguenots or political and military rivalry with France also helped to generate a favourable reception to Voltaire's writings.[104]

Considerably more important to Voltaire than the European mass public were the royal courts east of the Rhine, which represented the "enlightened North" almost exclusively in the eyes of the *philosophes*. Accordingly, the courts of Europe constituted a separate action space in which Voltaire was also engaged during the Calas affair, usually in tandem with his activities at the Court of Versailles. However, in the course of the Sirven affair, which involved major legal hurdles, the court public of Europe became the exclusive object of his persuasive efforts. Thus Voltaire addressed his publication *Avis au public sur les parricides imputes aux Calas et aus Sirven* (1766) solely to the royalty of the *North* while simultaneously doing everything possible to see that this pamphlet was not circulated in France.[105]

In order to succeed in this communicative space, Voltaire was dependent on media that gave him direct and discrete access to representatives of the European ruling elite and were thus comparable to media in

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[102] "Nous avons à Paris des opéra comiques, mais la sagesse est dans le nord; et avec toute nôtre guaieté frivole il y a chez nous plus d'atrocités que chez aucun peuple." D 13518.

[103] See D 12035, 11879, 12543 and 12845.

[104] See, for example, Russell Goulbourne, 'Voltaire and the Calas affair in England', in Cronk 2008 (note 12), 159–170.

[105] See D 13156, 13206, 13371 and 13735.

the royal and aristocratic segment of the public sphere in France. Above all he drew on his existing correspondence by letter with the crowned heads of Europe (Luise-Dorothea of Saxe-Gotha,[106] Karoline Luise of Baden-Durlach[107] and Friedrich II of Prussia,[108] among others) in order to secure their support for the victims of French justice. He also established contact by letter with additional members of royalty in the "North", making targeted use of the intermediary services of friends who shared the ideals of the Enlightenment.[109] Through the communication channel of private correspondence, he provided his royal correspondents with exclusive copies of his writings prior to releasing them for mass circulation.[110] In addition, Voltaire collaborated actively with Grimm's *Correspondence littéraire*, a secret hand-written periodical exclusively for royal clientele, which served to multiply the effect of his intellectual engagement in the courts of the "North".[111]

Through these communication channels, Voltaire was able to influence the opinions of his correspondents by formulating sample interpretations and reactions for them, which developed greater binding power thanks to the personal, non-anonymous form of communication. This technique also allowed Voltaire's method of emotional appeal, for example, to function exceedingly well among this specific and exclusive public: pursuant to the great consternation that Voltaire expressed in his letters, most of his correspondents hastened to emphasise the genuineness of their own emotion regarding the tragic fate of the Calas family.[112]

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[106] D 10626, 10655, 10690, 10775, 11073, 11146, 11169, 11286, 11304, 11510, 11542, 11927, 11953, 12846, 12872, 13367, 13438, 13468 and 13516.

[107] D 10625, 10656, 10669, 10782, 11648, 11787, 13370 and 13436.

[108] D 13148, 13183, 13365, 13402 and 13508.

[109] Thus Mme. Geoffrin served as an intermediary to establish contact with the Polish King Stanislas Poniatowski (D 13392, 13445, 13452 and 13518), and Friedrich Melchior Grimm, upon Voltaire's explicit request (D 13348 and 13375), helped to develop relations with subscribers to his *Correspondance littéraire*—Karolina of Hesse-Darmstadt (D 13435, 13486 and 13512) and Sophie Erdmuthe of Nassau-Saarbrücken (D 13917).

[110] Thus, for example, the *Traité sur la tolérance* was sent concurrently to influential persons in Versailles, Friedrich II, Luise-Dorothea of Saxe-Gotha, Karoline Luise of Baden-Durlach and Friedrich of Hesse-Kassel (D 11148, 11542, 11648 and 11685).

[111] Abrosimov 2007 (note 2), 177–187.

[112] See, for example, Voltaire's letter to Karoline Luise of Baden, in which he recommended a sentimental reading of the *Mémoire von Donat Calas* (D 10625), and the related response from the Margravine of Baden-Durlach (D 10656). Only Friedrich II, who remained distant from the sentimental culture of emotions, asserted in relation to the Sirven affair that, as an intelligent reader, he did not need to be emotionally overwhelmed in order to support the victims of intolerance. See D 13402.

Yet successful mobilisation of the court public of Europe in support of the victims of justice arose not only from clever instrumentalisation of the new sentimental linguistic code. Rather, its crucial prerequisite lay in a specific mode of interaction between princes who claimed the status of "enlightened monarch" [prince éclaire] and the "Patriarch of Ferney", who wanted to exercise political influence.

In his letters to royal correspondents, Voltaire presented himself as a respectful admirer of their great intellectual and moral status and cast them in the role of the true saviours of the innocent victims of justice.[113] By praising rulers in these Enlightenment tones, Voltaire appeared to adhere to the traditional communication role of the modest and grateful protégé. But the replies from his royal correspondents gave a completely different picture of the nature of their relationship. These correspondents celebrated with reverence not only Voltaire the writer and philosopher, who taught them the Enlightenment principles of humanity and tolerance,[114] but also, and in particular, the "advocate for humanity" whose immortal reputation would far overshadow their own greatness and importance.[115] The topos-like quality of these formulations shows that this was a communication code in which once-established roles had become reversible to a certain extent. Hence Voltaire's relations with foreign princes seem more balanced than his relations with the *grands* of France, in which a clearly unchanged social hierarchy was merely translated into the language of intimate friendship.

This tendency towards equalisation in relations between *philosophe* and *prince éclaire* can be found not only in the new linguistic code; it also affected performative aspects of communication between Voltaire and his royal correspondents. Both sides were interested in exchange of symbolic capital, as each lacked the sort which his respective communication partner possessed in abundance.

Through their expressions of solidarity, the royalty of Europe, who enjoyed the highest level of social prestige in a society of estates, lent to Voltaire's controversial endeavours a traditional form of legitimacy which even he as the "leading writer of the century" did not possess and which was still far from losing its significance among contemporaries. Furthermore, support from foreign rulers for the enlightened struggle against

[113] See, for example, D 12846, 13512 and 13436.
[114] See, among others, D 13486.
[115] See D 11953, 11304 and 13433.

religious intolerance generated general recognition of the party of the *philosophes* as a force with a positive effect on the state and society.

At the same time, the *philosophes*, with Voltaire at the forefront, were counted not only among the most prominent representatives of the *République des lettres* but were for many contemporaries throughout Europe the very embodiment of the Enlightenment movement. In accordance with this status, French Enlightenment figures could lay claim to possessing the exclusive competence to evaluate the degree of enlightenment and progressiveness of leading political actors. Against this background, contact with Voltaire by letter, and above all laudatory assessments from his pen, constituted a personal accolade, as clearly expressed by Karolina von Hessen-Darmstadt: "I realise the great value of the letter with which you have honoured me and for which I am moved with gratitude . . . If I have merited this attention it is by virtue of my disdain for fanaticism and the tyranny of superstition."[116] This was a new form of legitimation of power that was no longer based on traditional aspects such as membership in a time-honoured dynasty, a prominent position in the European power system or a splendid royal court; it was based solely on individual commitment to the ideals of the Enlightenment and corresponding action for "the good of humanity".[117]

Particularly royal personages who did not possess traditional sources of legitimisation in sufficient measure benefited from bestowal of the title *prince éclaire* as a reward for their activities on behalf of the victims of justice. Thus, for example, Catherine II of Russia, who had come to power as the result of a coup, was "cleansed" of the illegitimate and violent origins of her rule.[118] For representatives of minor courts in the Empire, participation in Voltaire's intellectual endeavours was also a chance for a symbolic elevation of status, as the Patriarch of Ferney described to Luise-Dorothea of Saxe-Gotha:

> Your Serene Highness has always acted well. All of your fellow princes do not imitate you—they fight battles, they win or lose them, they make treaties that are either dangerous or useful—but nurturing maligned virtue, searching in the depths of shame and misery for the unknown victims of persecution

[116] "Je sens tout Le prix de la Lettre dont Vous m'avés honorée, et j'en suis Touchée de reconoissance. . . . Si j'ai mérité cette attention c'est par ma haine pour Le fanatisme et pour La tiranie de la superstition." D 13486.

[117] See D 13435.

[118] See, among others, D 12834.

> and honouring them with considerable kind deeds—these things are done only by Madam the Duchess of Gotha.[119]

Such assessments of the historical importance of "enlightened monarchs" by the *philosophes* would also ensure the subsequent historical reputation of these monarchs by pre-empting the judgement of posterity, whereby one of the key categories in the traditional portrait of a ruler was appropriated as a tool for advancing the aims of the Enlightenment movement.[120]

Present and future enhancements of reputation thus constituted an important motivation for Voltaire's royal correspondents to participate in his campaigns on behalf of the victims of justice. The exchange of different types of symbolic capital resulting from the contemporaneity of different value systems also made it possible to establish long-term relations between the communication partners. Thus, in the course of the Calas affair, more was achieved than a one-time mobilisation of the public at European royal courts: an alliance between the party of the *philosophes* under Voltaire's leadership and the enlightened monarchs of Europe was forged which could be re-activated on the occasion of subsequent disputes between the *philosophes* and their enemies in France.

Consequently, securing the permanent allegiance of this exclusive circle was invariably considered in connection with the hoped-for effect on conditions in France. According to the internal logic of this communication strategy, "the enlightened courts of Europe" were to serve as a model for France.

Public gestures of solidarity from European rulers—particularly their ostentatious donations for the victims of justice—were partly addressed to the Court of Versailles. Protection and the traditional grace of royal largesse [magnanimité], as practiced by members of the European "société des princes" (Lucien Bély) in relation to the subjects of the French king, were intended to force the king's hand. At the same time, in Voltaire's view, the illustrious names of his royal supporters put them in a clear

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[119] "Votre Altesse sérénissime n'a jamais fait que de belles actions. Tous les princes vos confrères ne vous imitent pas madame, ils donnent des batailles, ils les gagnent, ou ils les perdent ils font des traittez ou dangereux ou utiles; mais secourir la vertu malheureuse, aller chercher dans le sein de l'opprobre et de la misère des inconnus persécutez, les honorer d'un bienfait considérable c'est ce qui n'apartient qu'à madame la duchesse de Gotha." D 11286.

[120] On the significance of historical reputation for enlightened rulers, see, for example, David Griffiths, 'To Live Forever. Catherine II., Voltaire and the Pursuit of Immortality', in Roger P. Bartlett, Anthony G. Cross and Karen Rasmussen (eds.), *Russia and the World in the Eighteenth Century* (Columbus 1988), 446–468.

position to inspire imitation among the general French public.[121] In this respect, Voltaire appealed to the Polish king, Stanislas Poniatowski: "Those who come to the aid of the Sirvens and who take up their cause need support from those whose names are respected and revered. We ask only to see our list honoured by those names that encourage the public."[122]

Conclusion

The communication strategies analysed here—namely the flattering of French decision-makers, the mobilisation of public opinion in France, and the cultivation of external pressure, above all from the European ruling elite—were used either simultaneously or alternately during the course of the Calas affair, depending on tactical requirements. All three approaches were necessary for the success of the campaign, whereby the communication code characteristic of each strategy retained its specific functionality. This is a clear demonstration of the polymorphous nature of the Enlightenment communication culture, which cannot be forced into the *Procrustean bed* of a universally accessible, egalitarian-minded and rationally acting "bourgeois public sphere".

On the contrary, Voltaire's strategies of intellectual engagement represent three distinct models of communication practices employed by the French *philosophes* which correlate with different concepts of the Enlightenment: the "top-down" Enlightenment, the "bottom-up" Enlightenment and the "external-to-internal" Enlightenment.[123] These three communication options can each also be found to different degrees in other "national" Enlightenment formations. Accordingly, they can serve as a *tertium comparationis* in reconstructing similarities and differences in the communication cultures that emerged in the eighteenth century, and hence to reconstruct the unity and diversity of the European Enlightenment(s).

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[121] Voltaire repeatedly emphasised that the important thing was not the amount of a donation but the name of the donor. See, among others, D 13364 and 13435.

[122] "Ceux qui secourent les Sirven, et qui prennent en main leur cause, ont besoin d'être appuyés par des noms respectés et chéris. Nous ne demandons qu'à voir notre liste honorée par ces noms qui encouragent le public." D 13392. See also D 13364.

[123] On the first two ideal types mentioned, see Simone Zurbuchen, 'Aufklärung "von oben herunter" oder "von unten herauf"? Die Berliner Preisfrage über den Volksbetrug (1780)', in Wilhelm Haefs and York-Gothart Mix (eds.), *Zensur im Jahrhundert der Aufklärung. Geschichte—Theorie—Praxis* (Göttingen 2007), 157–185.

COMMUNICATION AND REPUTATION. CORRESPONDENCES BETWEEN THE SCIENTIFIC CULTURES IN THE EIGHTEENTH AND TWENTY-FIRST CENTURIES

Daniel Fulda

Albrecht von Haller: Scientific Research with an "Honest Heart"

The scientific dispositive which emerged historically with the work of Albrecht von Haller currently seems to be losing its authority more than ever before in its 250 year history. Is the model of scientific organisation which developed in the course of the eighteenth century presently drawing to a close? This question will be addressed in the following essay, and not only in terms of the historical situation over 300 years ago; the second half of the article (sections IV. and V.) will address corresponding phenomena in contemporary scientific research.

If Haller has traditionally been assumed by historians to be the last "Universalgelehrter", or "Renaissance man",[1] this has recently been called into doubt by suggestions that the scientific and historical merits of the Bernese scientist's work lie in the area of experimental research in specific fields of study (such as physiology) and that he conceived of his work as contributing to the rise of specialization in research.[2] By opting for a method in which research was configured as a stepping-stone to gaining new knowledge and by employing the experiment as a central component of his work, Haller can be seen as a forerunner of *modern* science which is defined by precisely these criteria. What has previously been less commented upon, however, is the scientific model from which Haller wishes to distance himself. Hubert Steinke identifies Haller's new position in

[1] See, for example, Richard Toellner, *Albrecht von Haller. Über die Einheit im Denken des letzten Universalgelehrten* (Wiesbaden 1971). Christoph Siegrist sees in Haller the type of Renaissance man who would no longer be possible in modernity. See Walther Killy (ed.), *Literatur Lexikon. Autoren und Werke deutscher Sprache* (Gütersloh 1989), 12 vols., IV: 480–483: 480.

I wish to thank Dr. Barry Murnane for translating this essay and Ina Timmermann, MA, for her help in finding and evaluating the source texts. All translations are the translator's own unless otherwise acknowledged.

[2] Cf. Hubert Steinke, Claudia Profos and assisted by Pia Burkhalter (eds.), *Bibliographia Halleriana. Verzeichnis der Schriften von und über Albrecht von Haller* (Basel 2004), 12.

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opposition to conventional baroque scholarliness,[3] that is to say in opposition to the systematizing ambitions, universalism and concentration on philological work that located the scholar of the baroque period firmly in the mould of antiquity's *polyhistor*. While this need not be contradicted, it is also necessary to emphasize that the debates on the principles of scientific investigation in the first half of the eighteenth century were not solely conducted according to the alternatives of "baroque scholarliness" and "modern research". Instead a form of what can be termed "political-gallant scholarliness" emerged as a core ideal in opposition to traditional scholarly erudition around 1700. According to this new ideal, the site of the scholar's work was no longer merely his study; he was instead inclined to pursue practical work and seek social recognition more than ever before. This development is not limited to German-speaking lands,[4] but seems to have emerged particularly virulently in these states—perhaps because scholarly work at German universities was less socially integrated than at academies of science in other parts of Western Europe. In keeping with the Enlightenment ideal of altering everyday life, Christian Thomasius and his followers rejected the "book-learning" of "scholasticism" and polyhistorian universalism. In order for the scholar to have an effect on the world (they held) he must know how to make himself understandable to a broader public and also to take account of this public's needs and its various styles of communication beyond the scholarly world.[5] The scholar too must adhere to the ideal code of "gallant" behaviour according to which one's reputation in the eyes of others was the measure of one's conduct (this is what is meant by the "gallant conduct" at the centre of the second section of this article; section III deals with the role of political gallantry in the context of the history of science).

Albrecht von Haller was critical of this early-Enlightenment scholarly ideal, sometimes quite heavily critical in fact. And it is only when one locates his rejection of traditional compilatory forms of scholarship alongside this criticism that his real importance in scientific history becomes

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[3] Hubert Steinke, 'Der Universal-Gelehrte und Spezial-Forscher', *UniPress. Forschung und Wissenschaft an der Universität Bern* 135 (2007), 9–10: 10.

[4] Cf. Anne Goldgar, *Impolite Learning. Conduct and Community in the Republic of Letters, 1680–1750* (New Haven and London 1995); Steven Shapin, 'The Man of Science', in Katharine Park and Lorraine Daston (eds.), *The Cambridge History of Science*, vol. 3: *Early Modern Science* (Cambridge 2006), 179–191: 188–191.

[5] Cf. Gunter E. Grimm, *Literatur und Gelehrtentum in Deutschland. Untersuchungen zum Wandel ihres Verhältnisses vom Humanismus bis zur Frühaufklärung* (Tübingen 1983), 346–491.

more readily identifiable. In keeping with the signature of modern science as being predominantly objective, the political-gallant orientation towards acceptance by others is conceived by Haller to be the "valued naught of vain reputations".[6] Haller rails against figures of this type in his satirical poems and in the images of naive mountain-dwellers spared from the depraving influences of civilization throughout *Die Alpen* [The Alps]. In his scientific work he also assumes a similar position, underlining this in the *Physiologie* by claiming an honest heart and unadulterated language for himself.[7] Haller's adversary is precisely the "Mann nach der Welt" [man of the world] (as the title of a satirical poem in his *Schweizerischen Gedichten* states), the identity of which the scholar around 1700 was supposed to have taken on. This "man of the world" is characterized by "intellect and liveliness" with which, however, "decorated in the ugliness of vice" is also connoted; he embodies "the opposite of thoroughness and virtue" and he employs the powers of persuasion of gallant behaviour in order to confuse "the value of things" (as is stated in the poem itself).[8] As he goes on to suggest in a further poem on "The Falseness of Man's Virtues", "the approval of the whole world" stands in irresolvable opposition to "Wahrheit" [truth] for Haller, the pursuit of which is the true goal of mankind.[9]

Haller also afforded the pursuit of honour and esteem a positive role in the quest for scientific advancements, however. As he realistically assesses, "at best only a handful of researchers would be motivated enough to carry out their studies by the search for truth alone."[10] As Otto Sonntag and Hubert Steinke have observed, Haller's portrait of the scientist is "heavily informed by the possibility of material reward and the respect of both the state and the general public."[11] Accordingly, Haller allocates great

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[6] "Geschätztes Nichts der eitlen Ehre". Albrecht von Haller, 'Ueber die Ehre. 1728', in id., *Versuch Schweizerischer Gedichte* (sixth edn., Göttingen 1751), 9–23: 10.

[7] "Bewusstsein eines aufrichtigen Herzens und einer unverfälschten Redlichkeit". Albrecht von Haller, *Anfangsgründe der Physiologie des menschlichen Körpers* (Berlin and Leipzig 1776), vol. 8, foreword, fol. a5r.

[8] Quotes translated in the order of appearance above: "Geist und Munterkeit"; "die Häßlichkeit des Lasters"; "Gegensatz von Gründlichkeit und Tugend" and "der Dinge Werth". See Haller 1751 (note 6), 141–151: 142.

[9] "Die Falschheit menschlicher Tugenden"; "der Beyfall aller Welt". See ibid., 81–105: 88.

[10] Otto Sonntag and Hubert Steinke, 'Der Forscher und der Gelehrte', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008), 317–346: 336.

[11] Ibid., 336.

importance to scientific competition.[12] Ambition, a vice in moral terms, drives the scholar towards excelling in the pursuit of new knowledge. According to Haller's model, the scientist achieves respect not in the public opinion of "high society" but within science and its institutions itself, most notably in the form of academies. This is the central difference from the political-gallant scholarly ideal of the early Enlightenment: internal self-regulation within the emerging scientific community replaces orientation towards the general public which had previously been dominant. Haller transforms the competitive principles of "political" codes of behaviour into a motor of scientific progress.

Around 1700: On the "Gallant Conduct" of the Scholar

The term "political-gallant scholarliness" and its related cultural discourse around 1700 bring together multiple traditions of pre-modern anthropology, social theory and manners. According to one reading of the principles of social harmony, the orientation towards the expected reactions of others to one's actions and expressed opinions was held to avoid causing their disapproval and to ensure a general balance of interests by obliging everybody's aims. Another possible interpretation was founded on the premise of a society based on continuous competition; according to this reading, orienting one's actions towards each other implied a necessary vigilance towards potential adversaries and the ability to pursue one's interests by countering the adversary's resistance with polite behaviour. As ideal types these two models may be differentiated as gallant and "political" and thus as deriving from either the Castiglionian and later French ideal of skilful harmony or the survival strategies of Machiavelli and Gracián; "political" in this sense thus implies the tactical skill required of the polite gentleman.[13] The usage of these terms in the original sources reveals a blurring of the borders between both, however, which is related to a perceivable admixture of both concepts.[14] Hence this admixture will be referred to here as a "political-gallant" ideal of behaviour and competency.

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[12] Cf. ibid., 338f.

[13] For an initial overview, see Karl Heinz Göttert, *Kommunikationsideale. Untersuchungen zur europäischen Konversationstheorie* (München 1988).

[14] See Wilfried Barner, *Barockrhetorik. Untersuchungen zu ihren geschichtlichen Grundlagen* (Tübingen 1970), 178–180.

In Germany this ideal—originally conceived as a guide to surviving life at royal courts—had spread into all areas of social life and was being propagated by and for scholars since the late seventeenth century. Christian Thomasius, the *spiritus rector* of the reform university in Halle (founded in 1694), was particularly active in this field.[15] According to Thomasius, the power of reason with which the philosopher is recognisable must also (indeed: must especially) be maintained in social communication, namely in the speedy judgement of "anderer Menschen Gemüt" [the nature of other men].[16] Only by these means are individuals able to engage with each other. It is clear to Thomasius, "that a man be he ever so learned but of unskilled moribus and bad conduct has less chance of progressing in the world than another who is in possession of well-trained and polite manners."[17] This new priority was by no means unproblematic when viewed alongside the traditional preoccupation of philosophy with truth. Thomasius reinforced this claim by identifying a gap in the established criteria of correct behaviour—*honestum* as the morally righteous and *iustum* as the legally allowed—which he then proceeded to fill by introducing

[15] Commentators have seen Thomasius' decisive role in this context in many different ways, see: Wilhelm Kühlmann, *Gelehrtenrepublik und Fürstenstaat. Entwicklungen und Kritik des deutschen Späthumanismus in der Literatur des Barockzeitalters* (Tübingen 1982), 425–437; Leander Scholz, *Das Archiv der Klugheit. Strategien des Wissens um 1700* (Tübingen 2002), 80 and 84–85; Friedrich Vollhardt, '"Abwege" und "Mittelstraßen": Zur Intention und Programmatik der *Höchstnöthigen Cautelen zur Erlernung der Rechts=Gelahrheit*', in Heiner Lück (ed.), *Christian Thomasius (1655–1728). Wegbereiter moderner Rechtskultur und Juristenausbildung. Rechtswissenschaftliches Symposion zu seinem 350. Geburtstag an der Jurist. Fak. der Martin-Luther-Univ. Halle-Wittenberg* (Hildesheim, Zürich and New York 2006), 173–198 shows Thomasius' "paternity" over the new scholarly ideal in contrast with his contemporaries, who still focussed on older concepts of the scholar. This is not to suggest that Thomasius' was without predecessors in Germany; see Christian Weise, *Politischer* Academicus*, nebst dessen Väterlichen [!] Testament / Darinnen gewiesen wird / Wie nicht allein ein zukünfftiger* Politicus *seine Zeit und Geld auf* Universitäten *anwenden / sondern auch sein Christenthum also beachten soll / daß Er auf dieser Welt ein gutes Gewissen behalten / im Tode aber der ewigen Seligkeit sich versichern könne* (Leipzig 1685), see *Väterliches Testament*, 66 and 70 (own pagination). Weise advises the student and the academically educated to be "politically clever". He does not place one's use of knowledge under this maxim however.

[16] Cf. Christian Thomasius,... *Neue Erfindung einer wohlgegründeten und für das gemeine Wesen höchstnöthigen Wissenschafft / Das Verborgene des Hertzens anderer Menschen auch wider ihren Willen / aus der täglichen Conversation zuerkennen* (Halle 1691).

[17] "daß ein Mensch / der noch so gelehrt / darbey aber von ungeschickten moribus und übler conduite sey / in der Welt vielweniger fortkommen könne / als ein anderer / der ohne Gelehrsamkeit artige und höffliche Sitten an sich habe." Christian Thomasius, *Freimüthige, lustige und ernsthafte, jedoch vernunftmässige Gedanken oder Monatsgespräche über allerhand, fürnehmlich aber neue Bücher*, vol. 2: *July—December 1688* (Frankfurt/M. 1972), 647.

decorum as a further criterion. This *decorum* is configured as the form of conduct required in those dealings with others which do not conform to moral obligation or legal liability. Upholding the required forms of conduct not only serves to ensure social harmony, however; it also serves to increase the possibility of successfully fulfilling each individual's own personal interests.

"Take care to gain the respect of others by virtue of appearing to others both wise, learned, clever and skilled. I say: to others" writes Thomasius' follower and later professor in Göttingen Christoph August Heumann in order to describe the priority of respect in the eyes of others ("reputation") and the basic condition of competition ("before others").[18] A scholar who cannot present his findings and opinions correctly will be unable to communicate successfully and will be unable to expound his knowledge effectively. Even those writers who still afford "true respect before God and his word" over "the art of appealing to other men" recognize that "he who wishes to progress in the world and to attain a good standing amongst law-abiding men must be in possession of good manners; which means: he must know how to carry himself so that others view him as an intelligent, polite and skilled man" according to another commentator in Thomasius' circle.[19] To be respected, as even a later theologian with pietistic leanings observes, one needs "not simply great scholarliness, but also intelligent, sensible and skilled conduct."[20]

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[18] "Bemühe dich bey denen Leuten das Ansehen zu erlangen / daß du vor andern weise / gelehrt / klug und geschickt seyst. Ich sage: vor andern". Christoph August Heumann, *Der politische Philosophus, das ist / Vernunftmäßige Anweisung Zur Klugheit Im gemeinen Leben* (Frankfurt and Leipzig 1714), 153.

[19] Quotes translated in the order of their appearance above: "eine rechte Ehrerbietung gegen GOtt und sein Wort"; "die Kunst den Leuten zu gefallen"; "WEr in der Welt fortkommen will / und bey rechtschaffenen Leuten in guten Credit sich setzen / der muß eine rechte Conduite haben / das ist: Er muß sich also aufzuführen wissen / daß man ihn vor einen verständigen / höflichen und geschickten Menschen hält"; Friedrich Wilhelm Scharffenberg, *Die Kunst Complaisant und Galant zu Conversiren, Oder In kurtzen sich zu einen [!] Menschen von guter Conduite zu machen […]* (Chemnitz 1723), 1–2. Scharffenberg's book is based on a lecture manuscript from a colloquium given by Thomasius on conversation and manners. See Manfred Beetz, 'Anstandsbücher und Kommunikationslehren der Frühmoderne als gesellschaftsethische Wegweiser', in Hans-Gert Roloff with editorial assistance by Renate Meincke (eds.), *Editionsdesiderate zur Frühen Neuzeit. Beiträge zur Tagung der Kommission für die Edition von Texten der Frühen Neuzeit* (Amsterdam and Atlanta 1997), vol. 2, 729–738: 736.

[20] "nicht allein eine gute Gelahrtheit / sondern auch eine kluge / vernünfftige / und geschickte conduite". Johann Franz Budde, 'Moralischer Discours von dem Elend und Mängeln der Gelehrten…', in Martin Musig, *Licht Der Weisheit* (Frankfurt/M. 1711), vol. 2, unpaginated, § 24.

In the first third of the eighteenth century this political-gallant scholarly ideal was dispersed throughout Germany alongside the university reforms centred around Thomasius' Halle model (including the rejection of claims of validity of knowledge based solely on tradition as well as adapting teaching to practical needs).[21] "True science becomes laughable to many through unskilled expressions and gestures" warns Gottlieb Stolle as late as 1748, "whosoever does not possess the ability to make himself liked by others with the assistance of expressions and gestures, he will gain only little through his knowledge."[22] The dispersal of the political-gallant scholarly ideal is also underlined by critics such as Julius Bernhard von Rohr: "The love of gallantry extends not only to the various actions of civil men but has also reached the heart of the sciences and scholarliness. Many are now more concerned with gallantry than with solid scholarliness."[23] Advice to scholars to heed the rules of *decorum* can be found well into the second half of the century, usually in reference to Christian Thomasius who, despite his "mächtigen Studirgeistes" [great learnedness], was considered to be a man who "had the most impressive manners, even at court" and was gifted with "the best rules of sociable conduct," better than all others.[24]

Situation-Specific Flexibility as a Precondition of Modernity

How are we to evaluate this ideal of political-gallant scholarliness in terms of a history of science? It is suggested here that it should be considered

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[21] Cf. Anton Schindling, *Bildung und Wissenschaft in der Frühen Neuzeit 1650–1800* (München 1994), 54f.

[22] "Wahre Wissenschaften werden durch ungeschickte Minen und Geberden bey vielen zum Gelächter. Wer keine Fähigkeit hat, durch Minen und Geberden sich bey andern beliebt zu machen, der wird auch durch seine Erkenntnis keinen grossen Nutzen stifften." Gottlieb Stolle, *Kurtzgefaßte Lehre der Allgemeinen Klugheit. Mit einer Vorrede Vom Reformiren der Wissenschafften und Anwenden der Philosophie auf andere Theile der Gelahrheit* (Jena 1748), 160.

[23] "Die Liebe zur Galanterie, erstreckt sich nicht allein auf mancherley bürgerliche Handlungen, sondern sie ist auch biß in die Wissenschafften und die Gelehrsamkeit eingedrungen. Vielen ist mehr an der galanten, als an der soliden Gelehrsamkeit gelegen". Julius Bernhard von Rohr, *Einleitung zur Ceremoniel-Wissenschafft der Privat-Personen* [1728], ed. by Gotthardt Frühsorge (Leipzig 1989), 6.

[24] "Von dem angenehmsten Umgange, so gar bey Hofe, gewesen"; "bessere Regeln zum weltartigen Umgange". Johann Andreas Fabricius, *Rede die er bey seinem Antritt den 30 Octob. 1753 gehalten, und Ode auf die nächst verwichene der Kirche und Republik heilige Zeit, vom 25 December 1753. bis den 6 Jenner 1754, nebst einem Vorberichte von seinen Vorlesungen* (Nordhausen 1754), 4.

as an important step towards social modernization. When attempting to define what makes a society and its component elements modern, it is helpful to refer to the criteria of functional diversification into autonomous areas of social organization which function according to their own specific interests. The thesis that modern societies can be identified according to functional differentiation and diversity has most recently been developed in Niklas Luhmann's system theory; this key criterion of modernity is, however, derived from Max Weber's analysis of autonomous "spheres of values".[25] Viewed in these terms, the political-gallant orientation towards gaining the favour of one's respective rival can be adjudged to be a factor of modernization because it replaces the ambition to gain total knowledge—which was a signature of the seventeenth century—with an ideal of situation-specific flexibility which enables one to react to the functional division of social life.

Pre-modern European society was organized primarily according to rank, or rather—to be historically correct—in estates; forms of communication and action were decided by a person's own social position as well as that of his conversational partner. Upholding the privileges which defined the social borders downwards and gaining respect from those above one's social station was important for social positioning: "Doctors were not required to remain standing before magistrates and judges, they were allowed to sit and furthermore—as was the case for the aristocracy—to travel by coach. Doctors of Law were entitled to a special reception,—a version of the prioritization of all those who had graduated from a university with doctorates as opposed to those who had not."[26] There were even differences in rank between the different faculties within the university: from theology at the top, through jurisprudence and medicine, to the preparatory subjects of the philosophical faculty. This order was constructed according to the position each subject area had within the value system of pre-modern society; in no way whatsoever was this related to specifically scientific criteria, which is a sign that science had not yet gained a socially autonomous status. In their methods and teachings on the other hand—

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[25] Cf. Max Weber, 'Zwischenbetrachtung', in id., *Gesammelte Aufsätze zur Religionssoziologie* (Tübingen 1920), vol. 1, 536–573. Science as an autonomous system is analysed in Niklas Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt/M. 1992), 271–361, especially 271–299.

[26] Manfred Beetz, 'Der anständige Gelehrte', in Sebastian Neumeister and Conrad Wiedemann (eds.), *Res Publica Litteraria. Die Institutionen der Gelehrsamkeit in der frühen Neuzeit* (Wiesbaden 1987), 2 vols., I: 153–174: 157. Marian Füssel, *Gelehrtenkultur als symbolische Praxis. Rang, Ritual und Konflikt an der Universität der Frühen Neuzeit* (Darmstadt 2006) provides detailed analysis of this complex.

another indication of pre-modernity—the subjects and the faculties were far more closely related than today; one need only think of the expert in jurisprudence *and* philosophy Thomasius. The characteristic scholar of the seventeenth century was accordingly the *polyhistor* who tended to study all areas of knowledge.[27]

A literary representation of this type of scholar is Damis, the central figure in Lessing's early comedy *Der junge Gelehrte*. As a figure he not only combines all the bad habits of excessive scholarliness—wordsmithery instead of a concentration on real objects or problems, scholasticism, the quest for fame and overestimation of one's own abilities, excessive writing and claims of authority in all areas while actually getting bogged down in minor details, estrangement from everyday life, unsociability and bad manners and a lack of healthy self-criticism—Damis also appears particularly ridiculous in his appearance as a *polyhistor*: "I comprehend seven languages completely and am only twenty years old. I am unrivalled in the entire course of history and all its related sciences." Damis then airs his claims of superior ability in philosophy and eloquence, saying "and in the field of poetry I can open my hands to accept that most eternal crown of laurel."[28] He also claims to excel in the three higher faculties. He allows the maid to flatter him by proclaiming that he is "a skilled preacher;" (because he has "a fine stature" and "a strong, clear voice"); he is also able to "cure the ill" and "will one day be the best councillor in the world;" because he is in possession of "a quick tongue."[29] He refuses to acknowledge (as he puts it himself) that "our knowledge is patchwork."[30] The play was written in 1747 and hence in the last phase of universalist scholarliness which is portrayed here as being completely out of date and is meant to be dismissed with a laugh precisely *because* it no longer fulfils the requirements of a political-gallant scholarly ideal.[31]

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[27] On the crisis of universalism around 1700, see Wilhelm Schmidt-Biggemann, *Topica universalis* (Hamburg 1983), 288–292.

[28] "Ich verstehe sieben Sprachen vollkommen, und bin erst zwanzig Jahr alt. In dem ganzen Umfange der Geschichte, und in allen mit ihr verwandten Wissenschaften, bin ich ohne gleichen"; "auch in der Poesie darf ich meine Hand nach dem unvergänglichsten Lorbeer ausstrecken." Gotthold Ephraim Lessing, 'Der junge Gelehrte. Ein Lustspiel in drei Aufzügen. Verfertiget im Jahre 1747', in *Werke*, in cooperation with Karl Eibl et al., ed. by Herbert G. Göpfert (Darmstadt 1996), 8 vols., I: 279–374: 342f. (act III,3).

[29] "ein guter Prediger"; "eine schöne Statur; eine starke deutliche Stimme"; "Kranke kurieren"; "der beste Ratsherr von der Welt"; "eine fixe Zunge". Ibid., 323–326 (II,6/8).

[30] "Unser Wissen ist Stückwerk!" Ibid., 283 (I,1).

[31] Cf. Conrad Wiedemann, 'Polyhistors Glück und Ende. Von Daniel Georg Morhof zum jungen Lessing' [1967], in id., *Grenzgänge. Studien zur europäischen Literatur und Kultur*, ed. by Renate Stauf and Cord-Friedrich Berghahn (Heidelberg 2005), 107–132.

By the middle of the eighteenth century Damis' claim to excellence in every field of study was laughable *per se*. Nobody could command everything anymore—and that was no less true for Haller than for others, as he himself acknowledges: "La Nature ne nous a pas faits pour être universels."[32] The scholarly ideal of the *polyhistor* had become untenable because it stood in stark contrast to the inevitability of scientific specialisation.[33] Its decline was heralded by a flood of satires on the scholar who devoted himself to the study of thousands of important minor details but was completely impractical in daily life—Lessing's comedy is only one example. The new standards according to which the scholar was to be judged were on the one hand the enlightened ideal of usefulness,[34] and on the other hand—and as maintained here: even primarily—the political-gallant ideal of proficiency. The *polyhistor* was doomed to fail the litmus test of enlightened utility because his knowledge was gained solely from reading books and was thus—depending on how old the sources were—more likely to be caught up in the world of antiquity than in the everyday life of his contemporaries. What was in fact demanded was a focus on present events and practical matters, a focus which was a genuine component of the political-gallant ideal, too, which also established further behavioural codes besides these. As already shown, the political-gallant scholar knows that his importance is only ever possible due to his reputation among others. He will not behave in the manner of an eccentric or a misanthrope as in these depictions of the *polyhistor*. He knows that his contemporaries will not turn a blind eye to his ignorance of bodily hygiene and sense of dress (*misocosmia*—another much-loved motif in these satires) in order to honour his powers of thought. And he has further learned that communication is only successful if one can adapt to one's contemporaries and knows how to adhere to their conventions of behaviour. At one point in Lessing's play, the *polyhistor* is correctly portrayed in the following damning judgement: "He has read everything, except a book of polite manners",[35] that is as much as to say: he is well-educated,

[32] Cited in Steinke, Profos and Burkhalter 2007 (note 2), 12.

[33] Cf. Gunter E. Grimm, *Letternkultur. Wissenschaftskritik und antigelehrtes Dichten in Deutschland von der Renaissance bis zum Sturm und Drang* (Tübingen 1998), 146 with reference to the corresponding diagnosis in the article 'Polyhistor', in Johann Heinrich Zedler, *Großes vollständiges Universal-Lexikon aller Wissenschaften und Künste* (Leipzig and Halle 1732–1754), 64 vols. and four supplementary vols., XXVIII (1741): col. 1319.

[34] This aspect is emphasized by Wolfgang Martens, 'Von Thomasius bis Lichtenberg: Zur Gelehrtensatire der Aufklärung', *Lessing Yearbook* 10 (1978), 7–34.

[35] "Er hat alles gelesen, nur kein Komplimentierbuch". Lessing 1996 (note 28), 281 (I,1).

but he hasn't the faintest idea as to how to express himself correctly and politely to others (the book of manners being the corresponding guide). To sum up this change in social definitions of scholarliness with a pun: *knowing how to behave* takes over the normative position of being a *know-it-all*. (fig. 1)

Once again: what is modern about the fact that functional systems diversify in this sense? On the one hand, and seen negatively, what is modern about diversification is the rejection of an ideal of comprehensive knowledge, or as Damis puts it, the ideal of the "universal understanding."[36] On the other hand, and now viewed in terms of a positive change, one can identify orientation towards a model of practice which differentiates between different functions. What defines the *Politicus*, or courteous gentleman, is his situational flexibility, that is to say, his ability to adapt to constantly changing opponents, constellations and demands. He is not only familiar with practical action as opposed to theory but is also thoroughly aware of the difference between the many forms of practise with which he must expect to be confronted. And last, but by no means least, proof of his powers of judgement is provided by his awareness of different social demands and his ability to vary his behaviour accordingly. "*To be company for all sorts of men*. He is a wise *Proteus* that is holy with the holy, learned with the learned," writes Gracián, the most influential proponent of the *Politicus*-ideal.[37] This specific moment of political *nous* is what enables the scholar in the early eighteenth century to meet the demands of nascent functional diversification into autonomous social systems.

Thus the ideal of the political-gallant scholar also lays the foundations for the emerging autonomous status of science. However, it does so in ignorance of this autonomy, as it does not consider science as a self-sufficient system but as entangled in society in general. Its need for situation-specific flexibility developed as soon as systematic differentiation began to develop—and it declined in importance as soon as this process was complete. The ideal of the political-gallant scholar thus represents a transitional phenomenon between universalism and subject-specific specialization and provides a path from a form of learning dominated by tradition to the future-oriented model of scientific research. Put more graphically, it

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[36] "der Mensch ist allerdings einer allgemeinen Erkenntnis fähig." Ibid., 283 (I,1).

[37] Baltazar Gracián, *The Courtiers Manual Oracle, or, the Art of Prudence* (London 1685), 76. [Baltasar Gracián, *Obras Completas*, ed. by Manuel Arroyo Stephens (Madrid 1993), 2 vols., II: 221 (no. LXXVII): "Saber hacerse a todos. Discreto Proteo: con el docto, docto, y con el santo, santo".]

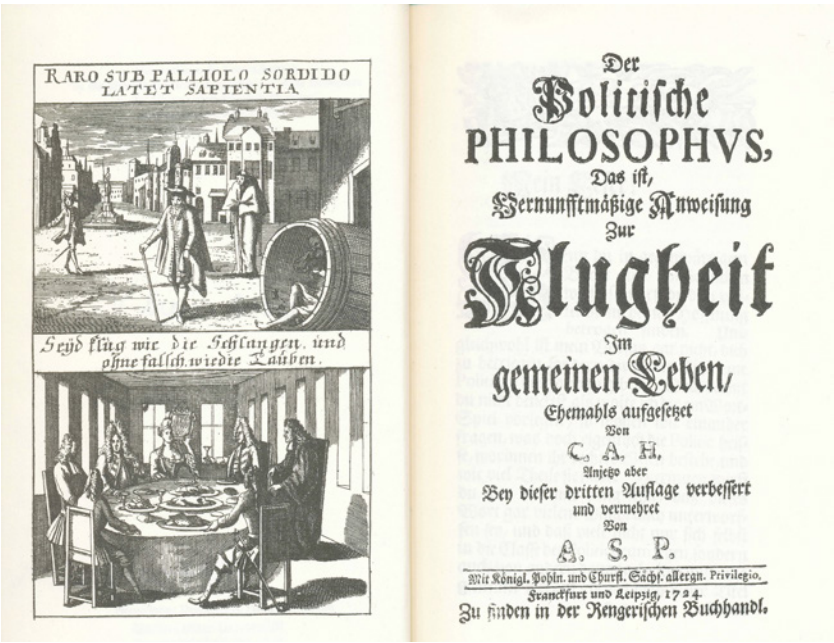

Fig. 1. "Raro sub pallaliolo sordido latet sapientia": "Seldom is knowledge to be found under a dirty cloak." The frontispiece to Christoph August Heumann's *Politischer Philosoph* portrays a representative of the traditional scholarly habitus (in the middle of the picture the bearded figure with a hat, in the background old-fashioned buildings) in a field of conflicting world-views: between scholarly contempt for the world (Diogenes in his barrel) and scholastic philosophy (embodied in a monk), on the one hand, and excessive conformance to courtly conventions on the other (the squire in the background on the left of the picture). The picture does not depict the ideal of worldly scholarliness itself; the inscription, however, contrasts adequate scholarliness primarily with flawed decorum as manifested in imperfect cleanliness (misocosmia)—traditional scholarliness is insufficient in this respect, as the handkerchief in the scholar's hand suggests.

"Be shrewd as snakes and honest as the doves": this biblical quote from Matthew 10.16 legitimates tactical canniness in a competitive world. What is allowed and recommended is compliance with the social conventions in the lower picture, but without affectation (dissimulatio) and deceit. The shared meal is also one of the situations in Lessing's comedy in which the scholar fails to uphold the conventions of decorum by speaking with his mouth full, reading a newspaper at the table, seesawing back and forth on his chair and by knocking over a glass (see *Der junge Gelehrte* III,1, 337–8).

forms the image of the scientist at precisely the moment in time in which the *scholar* has left his study and before he once again, having mutated into the *researcher*, retires from the public sphere into the laboratory or the archive.

Around 2000: The Return of "Political-Gallant" Science

At present one can identify a situation in which science is being reconstituted through an increased focus on the judgement of its addressees; astonishing parallels to the situation discussed here become visible in three current strands of debate operating on different levels of diagnosis.

Firstly, criticism of current developments within the scientific system is growing among the scientific community itself: scientists throughout Europe complain bitterly about the accelerated change to their working conditions, about increasing financially motivated pressure from "outside", i.e. political, economic and management pressure, about the demand for knowledge which will produce measurable utilitarian gains and economic value whilst also concentrating on educating students in such a manner that they will be of immediate practical use to the industry. In Germany these changes are accompanied by the enforced introduction of the Bachelor and Master system as well as the politically steered competition for "top researchers" entitled the "Excellency Initiative". For the philosopher Martin Seel this means nothing less than the abandonment of the internal value criteria immanent to the scientific system itself: "The background of the Excellence Initiative and international competition has meant that universities have begun paying more attention to their public reputations. . . . The criterion of success is not primarily judged by the quality of the research and teaching but by the university's 'standing' in national and international comparison."[38] The sociologist Clemens Albrecht reaches a similar conclusion and is critical towards an over-reliance on external co-ordinates and forces: "Whereas a scientist's freedom once lay in his or her being able to choose his or her subjects autonomously, the social forces of research programmes, funding alliances, graduate schools and excellence clusters now dominate. . . . Intrinsic motivation, insistence on pursuing one's own interests, has become dysfunctional in this research landscape." According to Albrecht, this results in behaviour oriented

[38] Martin Seel, 'Vom Verbund zur Firma. Zwei Arten der wissenschaftlichen Konkurrenz', *Forschung & Lehre* 14 (2007), 16–17: 16. The following quote ibid.

towards careerism [Karrieregründe] and Potemkin-like facades [potemkinsche Fassaden].[39] Significantly, this conclusion describes precisely one of the most important behavioural codes of the *Politicus*: "This produces a new character type in the sciences, which is guided by external forces and is constantly mobile in relation to the varying dominant interests."

A further complex of signs that the "political-gallant" ideal of proficiency is making a return can be identified in the current significance of theories of "performativity". "Performance" has emerged as one of the most successful themes in the Humanities since the mid-1990s.[40] Texts and actions are considered to be performative if they first produce that of which they speak or with which they engage. The most important foundations of performativity are—as is well-known—John Austin's speech-act theory and the emphasis placed by theatre studies on the independence of theatrical performances from, for example, their respective source texts. In Austin's terms utterances are performative when they not only describe facts but much rather create new facts because they carry out actions—the most famous example of such a performative utterance is saying "I do" at the altar or in the registrary-office.[41] Similarly, what is enacted on stage is on the other hand not only performative when the artform is improvised (as in happenings or flash-mob); in classical theatre it is not the case that something already present is simply enacted, rather that which was depicted is actually created in the act of depiction itself. Additionally, at the core of the current performance-terminology is the concept that one cannot merely describe individual utterances or actions as performative, rather speech and actions are identified as performance *per se*.[42] Simultaneously, theories of performativity have become a more

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[39] Clemens Albrecht, 'Vom Aufstieg und Niedergang der Geisteswissenschaften', in Jörg-Dieter Gauger and Günther Rüther (eds.), *Warum die Geisteswissenschaften Zukunft haben! Ein Beitrag zum Wissenschaftsjahr 2007* (Freiburg, Basel and Wien 2007), 448–457: 454. The following quote 454–455.

[40] Cf. Erika Fischer-Lichte, *Ästhetik des Performativen* (Frankfurt/M. 2005); Uwe Wirth (ed.), *Performanz: Zwischen Sprachphilosophie und Kulturwissenschaften* (Frankfurt/M. 2002); Marvin A. Carlson, *Performance. A Critical Introduction* (second edn., New York 2004).

[41] Cf. John Langshaw Austin, *How to Do Things with Words* (second edn., Cambridge 1975), 5f.

[42] As noted by Joachim Scharloth with relation to the further development of speech-act theory in 'Performanz als Kategorie einer kulturanalytischen Linguistik', *Zeitschrift für deutsche Philologie* 126 (2007), 390–410: 392. According to Scharloth, Austin had already abandoned "the dichotomy of performatives versus constatives in the course of his lectures in order to posit a model of speechacts . . . in which the illocution as a completion of an action becomes a dimension of all speech".

general cultural theory: the description of a thing or the completion of an action is thus not simply a second step which merely represents or recalls something which was previously present (for example, a discovery or a pattern of action). Representation and execution are in fact more deeply constitutive; in them those objects are constituted which they supposedly merely represent.

The term "performativity" can be located alongside the "political-gallant" scholarly ideal because both are directed at addressees and both identify presentation as being decisive. One can certainly argue that Thomasius and related authors would never assume that the presentation (including one's self-presentation) which they demand be observed and cultivated is of any major substance, i.e. based on any well-founded knowledge. Indeed one cannot observe any explicit element of constructivism in science, philosophy or even general world-views around 1700. It is notable, however, that the need to penetrate to the real core of a subject is seen to be a serious problem, particularly in the tradition of "political" intelligence which Thomasius transferred into the ideal behaviour of the scholar. The wily *Politicus* is not only well-skilled in dissimulation, i.e. in concealing his intentions; he also knows that his opponents are equally engaged in the same practise. How can one see through someone who is consciously engaged in dissimulation? And who takes account of the fact that he is being observed and interpreted by others? This reciprocity of political tactics can pull the rug out from under even the most subtle judge of human character because if the other person knows that his rival wishes to see through him, he will not only try to hide his intentions but also hide the act of concealment itself. Gracián explicitly recommends this: "Not to pass for a Crafty Man. It is the greatest cunning to hide that which passes for cheating."[43] This sets an endless extension of simulation in motion, in which the real—the true intentions of one's rival—constantly evades recognition.

At this stage the opposition of "core" and "shell" has not been theoretically abandoned, but its, i.e. the core's, practical inaccessibility is the central problem of the *Politicus*. The practical blurring of distinctions between core and shell also distinguishes the techniques of self-assertion of the *Politicus* fundamentally from the effect-based orientation which

[43] Gracián 1685 (note 37), 197f. [Gracián 1993 (note 37), II: 275 (no. CCXIX): "No ser tenido por hombre de artificio, … El mayor artificio sea encubrir lo que se tiene por engaño."]

had been demanded by the practise of rhetoric since antiquity, because there the distinction between *res* and *verba*, between thought and decorative words was never called into question. As a practitioner of political-gallant science, one can therefore view Thomasius as an early theorist of performativity. Or viewed in the opposite historical direction, one can say that because theories of performance are so successful at present, it is conceivable that there is a notable correspondence between the eras around 1700 and 2000.

Indications of the return of political-gallantry can thirdly be identified within the sociological school of system theory. In 2007, the renowned Suhrkamp-Verlag published a monograph by Dirk Baecker entitled *Studien zur nächsten Gesellschaft* [Studies on the Next Society].[44] Baecker rejects Niklas Luhmann's, his erstwhile teacher's, thesis that we will not be moving beyond *modern* social life anytime soon. What Baecker terms "next" is a post-modern society which is presently in formation, and he refers less to an uncertain future state itself than to the development which is currently occurring. In his view, this social order is essentially defined by the "consciousness of the opacity of relations" [Wissen um die Intransparenz der Verhältnisse], (9). "Overarching orders" or a "universal meaning" can no longer be assumed by anybody (9). With this uncertainty it is only possible to react "relatively and problem-oriented, that is to say, pragmatically" (225). "The next society in all its structures" writes Baecker, "will be focussed on determining each next step from case to case, at which stage one can risk a fleeting glance at the conditions one finds there." (8) One can only help one's self through "recursive self-referentiality" (9), that is to say, through observation of one's own ability to cope with the "opacity of the conditions".

All these characteristics of the "next society" apply equally to the situation of the *Politicus* as described by Gracián. That there is no "complete order" or "total meaning" was not something any Jesuit would have said. His rules of good sense are, however, arranged to account for precisely this situation: "We are to use Humane means, as if there were none Divine" is one of the most famous maxims in his *Oráculo*.[45] The *Politicus* is completely self-reliant in relation to his fellow man, who always appears as a competitor in social life. He must attempt to be opaque—impossible

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[44] Cf. Dirk Baecker, *Studien zur nächsten Gesellschaft* (Frankfurt/M. 2007). All further references will appear in parentheses in the main text.

[45] Gracián 1685 (note 37), 230. [Gracián 1993 (note 37), II: 286 (no. CCLI): "Hanse de procurar los medios humanos como si no hubiese divinos"]

to see through—in order to provide as few points of attack as possible and because the others also present themselves in this manner.[46] Gracián offers no set of rules with which one can see through one's competitors in spite of this social practice, as the uncertainty pertaining to every situation is different in every new constellation and can never be mastered through simple application of general laws. The aphoristic and, in some places, self-contradictory maxims in the *Oráculo* have no guaranteed rules of cognition other than such as would allow one—and here one arrives at Baecker's position—to deduce "to the specific from the particular" [vom Besonderen auf das Besondere zu schließen] (110). It must be stressed that Baecker formulates this logic of behaviour above and beyond the order of subordination solely in terms of contemporary society in which the lack of a "total meaning" no longer allows conclusions in any conventional manner—whether deductive, inductive or analogical.

Does this mean that the situation 300 years ago was *identical* to that which Baecker identifies today? Such a reading would mistake what has been shown here as parallel structures as being one and the same. Baecker writes on a society *after* modern society; the situational flexibility of the *Politicus*, on the other hand, can be interpreted as a reaction to the functional differentiation of social systems with which modern society *began*. Furthermore, there is a crucial difference between the social coverage of this radical experience of opacity in the early modern period on the one hand, and that in a society after modernity on the other. Gracián is an esoteric writer with a small audience in mind and his sceptical cognitive outlook is, for example, already tempered by Thomasius in a host of rules for penetrating opacity with thoroughly deductive ambitions.[47] Baecker's intentions, on the other hand, are to describe social processes of transformation which can have an effect on everyone (13). This is ensured by the medium of the computer, the medial *a priori* of the "next society" which, with its technical principle of "recursive self-referentiality" and

[46] Cf. ibid., no. III: "Not to be too free, nor open", 2. ["Llevar sus cosas con suspension", 193]. In this maxim opacity is said not to be only the result of human efforts which could be concentrated in different directions, but to be feature of the world in general, especially in religious contexts: "We ought then to imitate the method of God Almighty, who always holds men in suspense", 3. ["Imítese, pues, el proceder divino para hacer estar a la mira y al desvelo.", 194]

[47] On Thomasius' efforts to scientifically categorize these processes of investigation and the subsequent diagnostics in the German Enlightenment, see my own article 'Wissen und Nicht-Wissen von anderen Menschen. Das Problem der Gemütererkenntnis von Gracián bis Schiller', in Hans Adler and Rainer Godel (eds.), *Formen des Nichtwissens der Aufklärung* (München 2010), 483–504.

its demands of a robust opacity [robuste Intransparenz] provides the paradigm of its basic social forms (9). Capable of memory and remembering so that it begins "to communicate in society too in a way only previously associated with humans," (9), the computer represents a new source of unpredictability (225–226) to which the society must react with relevant cultural patterns. The proponents of political cleverness from Gracián to Thomasius did not actually anticipate the contemporary situation, but they did examine that which is today—if one accepts Baecker's argument—a general challenge for everyone, even if only as the ideal behaviour of a minority.

Baecker extends his argument to include the university system. In modern societies science had the task of functioning "as the principle for negotiating uncertainty" [als Prinzip der Ungewissheitsabsorption], (226). In the "next" society science will no longer be able to perform this task because it will no longer have access to the Universal [das Allgemeine]—whether this be the "Reason of the Enlightenment, the course of history, the laws of nature or the meaning of life, which is used as a reference point in order to sort and assess everything else" (111). What universities are required to communicate—and according to Baecker they are unable to do anything else—is the ability to cope with a *lack* of knowledge [mit Nichtwissen umzugehen]. And this is crucial: "Whoever is unable to do so can do nothing. But whoever can do so is able to build on this foundation and gain any form of knowledge at all without ever mistaking this with certainty and thus cast doubt on his competency and his talent" (107).

1700/2000: The Dawn and Decline of Modernity?

What are we to make of these tendencies in our present society, which once again recommend the habitus of the political-gallant scholar? Those commentators on present higher-education policy already referred to appear to be critical and condemning. Performance theory is less inclined to be judgemental; and by all accounts it configures the performative not only as merely external but much rather maintains an emphatic relationship with its subject. Baecker can after all have his fun with the opacity, the situational and the self-referentiality which are the distinguishing features of the "next society"—even if it is just the fun of theoretical games and intellectual provocation.

So who is right then, the critics or Baecker? Before answering this question it is worthwhile considering a methodological issue: we are unable to

observe contemporary transformation processes with the same historical distance that enables us to examine the ideal of political-gallant scholarliness around 1700 with such clear-headedness. This is not only problematic in terms of forming a judgement. No less problematic is the difficulty of making judgements on the historical significance of current change in the scientific system: does this change "merely" indicate a crisis in the "old"—i.e. modern—society while the old functional and behavioural patterns maintain their validity in principle? Or are these really the first signs of the "next society"? The difficulty of forming a long-term judgement in the midst of a process of transformation is not least mirrored by Baecker's barely systematic manner of argumentation; the necessary distance for a thorough analysis is simply lacking.

This does not mean that all the arguments expressed are exempt from an analysis of their correctness. The critical commentators cited above form their arguments according to the scientific paradigm of "modern" society; they see research as being subject to an interest in the "matter alone" and claim loneliness and freedom [Einsamkeit und Freiheit] as being essential to the scientist, that is to say, those privileges or virtues identified by Wilhelm von Humboldt as the preconditions of creative research.[48] Also popular is Mommsen's phrase about the "Lebensnerv" of our universities, namely "disinterested research which doesn't uncover what it should find and wishes to find according to a set of goals and considerations, nor does it research anything which may be of practical use beyond the pursuit of science; instead science is dedicated to whatever the conscientious scientist deems logically and historically correct."[49] The implicit "either-or" of legitimate internal (Humboldt's "reine Wissenschaft" or pure science)[50] *or* distorting external coordinates alone does seem to be more of programmatic than analytical or theoretical value. Science is never disinterested (as Mommsen himself noted only a short time afterwards;[51] this famous dictum is drawn from the dispute relating to the appointment of a Catholic to a chair for history). Science is never focussed solely on its content alone, instead it aims to achieve validity for its subject and hence also for itself. And so the critic of competition quoted above accepts that "the

[48] Wilhelm von Humboldt, 'Über die innere und äußere Organisation der höheren wissenschaftlichen Anstalten in Berlin', in id., *Bildung und Sprache*, collected by Clemens Menze (fourth edn., Paderborn 1985), 118–126: 118. Similar findings in Humboldt, 'Der Litauische Schulplan' [1809], ibid., 111–117: 114.

[49] Theodor Mommsen, *Reden und Aufsätze* (second edn., Berlin 1905), 432.

[50] Humboldt 1985 (note 48), 114.

[51] Cf. Mommsen 1905 (note 49), 434.

best explanation or interpretation of a phenomenon is achieved through a battle, as it were."[52] Haller formulated this insight, as we saw, at the dawn of modern science itself.

Theorists of science such as Steven Shapin and others have, in principle, called into question the opposition of science and society: "There is as much 'society' inside the scientist's laboratory, and internal to the development of scientific knowledge, as there is 'outside'."[53] In addition to this, the "things" in scientific investigation cannot be seen independently of the people engaged in this activity: "Knowledge is a collective good," Shapin concludes, before going on in a conspicuously politically-gallant manner to point towards the "ineradicable role of people-knowledge in the making of thing-knowledge." Recent theories of scientific investigation have, as a consequence of these ideas, been "shifting attention from the theory of science *to its practice*."[54] Seemingly objective facts and provisionally accepted, situational truths are seen to be socially and communicatively fabricated.[55] Representation is no less central to this form of practise without which no science can function—either internally or externally. Science must represent its knowledge if it is to be in any way viable; knowledge must reach its addressees (both other scientists and external participants alike) and be discussed if it is to be at all feasible. Even the most esoteric research needs to be addressed to an audience—in the most minimal scenario to at least one colleague or, on a larger scale and for posterity, in book form.[56] It is not of importance how large the

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[52] Seel 2007 (note 38), 16. Seel distinguishes between "good" competition among experts and the "bad" ("schielen[dem]" or "leering") need for approval from outsiders. This difference seems to me both correct and important in linking the unavoidable recognition of the performance aspect in science with the claim of internal criteria of respect in the scientific community itself. To emphasize the point: "Internal" does not mean "inherent to research of the facts in hand".

[53] Steven Shapin, *The Scientific Revolution* (Chicago 1996), 10. With specific reference to the contemporary situation, see: Mark Erickson, *Science, Culture and Society. Understanding Science in the Twenty-first Century* (Cambridge 2005), 217.

[54] Steven Shapin, *A Social History of Truth. Civility and Science in Seventeenth-Century England* (Chicago and London 1994), xxv and xxvi.

[55] Cf. Lorraine Daston and Peter Galison, *Objectivity* (New York 2007).

[56] Where the "next society" is founded by the computer, Baecker analogously identifies the book with "modern society" (see 103). This argument of a relationship between book culture and a "modern", i.e. Humboldtian understanding of science is supported from a historical perspective by Dietrich Kerlen, *Das Buch als Medium akademischer Professionalisierung. Vermessung eines Sonderwegs*, URL: http://www.uni-leipzig.de/~kmw/relation/text/6-fl.htm (accessed 24.11.2006). Kerlen correctly emphasizes that the idea of a "pure science" (Wilhelm von Humboldt) led to a massive reduction in importance of social contacts and competency.

field of addressees is—communication is unavoidable, even constitutive, and science always has a performative dimension. In his pioneering study on the forms of communication and the media of science around 1700, Martin Gierl concludes in these terms: "Science is indeed a matter of communication . . . Knowledge is power. That means: knowledge is what one makes of it."[57]

The attention afforded to communication, social standing and normative behaviour cannot simply be accounted for as either an external force or a specifically courtly practise, even if the relevant impulses around 1700 are indeed of aristocratic origin. In the scholarly world valid rules of behaviour generally remained implicit, as Martin Mulsow points out: "One had command of what was appropriate, polite, honourable, proper, but one did not define it."[58] The political-gallant ideal of scholarliness breaks this rule. What was new around 1700 is not the fact that there were rules for the governance of behaviour (and in the seventeenth century such rules were already oriented towards the aristocratic habitus in countries less influenced by the university system with its corresponding scholarly ideal); what was new was that these rules were made explicit and subject to a need for justification. The political-gallant discourse achieves this because the gallant pursuit of the approval of others and the attitude towards "political" competition logically set in motion a consideration of the inherent communicative nature and the representation of objects and people without which science would not be able to function.

One has to look as far back as 1700 in order to find examples of thinkers in the German scientific community daring enough to stipulate such a scholarly self-image. The relative isolation of this pioneer status is what makes the ideal of the political-gallant scholar so interesting in today's debates. The gains made by Thomasius and his followers by including the scholar in the political-gallant ideal oriented towards one's standing in the opinion of others appear to be of relevance today because they have not yet been overcome. Thomasius provoked a scandal in Leipzig by lecturing in German instead of the customary Latin and by doing so whilst wearing a

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[57] Martin Gierl, 'Korrespondenzen, Disputationen, Zeitschriften. Wissensorganisation und die Entwicklung der gelehrten Medienrepublik zwischen 1670 und 1730', in Richard van Dülmen and Sina Rauschenbach (eds.), *Macht des Wissens: Die Entstehung der modernen Wissensgesellschaft* (Köln, Weimar and Wien 2004), 417–438: 417.

[58] Martin Mulsow, 'Unanständigkeit. Mißachtung und Verteidigung der guten Sitten in der Gelehrtenrepublik der Frühen Neuzeit', in id., *Die unanständige Gelehrtenrepublik. Wissen, Libertinage und Kommunikation in der Frühen Neuzeit* (Stuttgart 2007), 1–26: 3.

colourful lace-plaid coat instead of the traditional scholarly gown.[59] That he did this showed not only a change in attitude with respect to his public, instead it served to actually create an awareness of this attitude in the first place.

The question as to what we are to make of the fact that it is cultural theory, of all things, which has revived interest in the value of representation and of performance remains to be answered. If one believes Baecker, the parallel between 1700 and the present can be identified as a means of defining the start and the end of modernity. That would mean that modernity is currently drawing to a close, not least in the system of science: the current parallels with the developmental phase of modern science show that modernity's suppression of extra-systemic references is breaking down. What is thus apparently drawing to its conclusion is the modernity which began with Haller and defined itself as an epoch of scientific investigation purporting to be interested in the pursuit of "the thing itself" alone. Whether or not we really do find ourselves in such a historical phase of transformation, as Baecker clearly believes, is difficult to say. We can however think this possibility through and the comparison with our predecessors, both Thomasius in his lace-plaid coat and the great man from Bern, Albrecht von Haller, may be of assistance to us in doing so.

[59] Cf. Beetz 1987 (note 26), 166–167.

CONTROVERSY AS THE IMPETUS FOR ENLIGHTENED PRACTICE OF KNOWLEDGE

Rainer Godel

"Thus, our conflict with the free thinkers is not a mere theoretical dispute, a war over full space or empty space in which the one who is in error remains as virtuous as before and the one who is right does not take a course that is closer to virtue. It is a war between good and evil, between the bliss of the world and its distress."[1] Albrecht von Haller used this martial language in 1751, at the climax of his dispute with Julien Offray de La Mettrie, in order to argue polemically against the libertines. Haller describes the dispute as a conflict that takes place on two levels: the "theoretical" level, where they argue about God's existence, and the level of "morality", with practical consequences for human behaviour. He maintains that both levels of this dispute are immediately connected. To him, it is not only an issue that freethinkers deny God's existence, but also that lack of faith affects real, everyday life. These connections between different areas are the central point of the argument made in the present article. Connections between areas that are capable of producing "evidence" in completely different ways and of different scope are one of the core features of a "controversy" identified by recent research on controversies.

What Is a Controversy?

Researchers have recently drawn on the concept of controversy developed by Marcelo Dascal.[2] Dascal distinguishes three ideal types of polemical

[1] "Es ist also unser Streit mit den Freygeistern nicht eine blosse theoretische Zwistigkeit, ein Krieg über den vollen und leeren Raum, wobey der irrende eben so rechtschaffen bleiben kan, und der rechthabende keinen näheren Weg zur Tugend erwählt. Es ist ein Krieg zwischen dem Guten und Bösen, zwischen dem Glücke der Welt und ihrem Elende." Albrecht von Haller, 'Vorrede des Uebersetzers', in [Johann Heinrich Samuel Formey], *Prüfung der Secte die an allem zweifelt, mit einer Vorrede des Herrn von Haller* (Göttingen 1751), 7–55: 53.

[2] Cf. Marcelo Dascal, 'Types of Polemics and Types of Polemical Moves', in Světla Čmejrková et al. (eds.), *Dialoganalyse VI. Referate der 6. Arbeitstagung Prag 1996. Dialogue Analysis VI. Proceedings of the 6th Conference Prague 1996* (Tübingen 1998), part 1, 15–33; Carlos Spoerhase, 'Kontroversen: Zur Formenlehre eines epistemischen Genres', in Ralf

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exchange: discussion, dispute, and controversy.[3] The starting point for this differentiation is the pragma-linguistic critique of speech act theory: Communication does not regularly lead to understanding, but pursues goals that are not necessarily rational with means that are not necessarily rational either. Discussions are, according to Dascal, polemical exchanges whose object is a well-circumscribed topic. They aim at true solutions, consisting of the elimination of mistakes concerning the definition or explanation of the object, which are admitted by both sides. On the other side of the scale, there is, according to Dascal, the "dispute". Here, at no point do the contenders accept the definition of the problem as grounded in some mistake. "Rather, it is rooted in differences of attitude, feelings, or preferences."[4] Disputes do not have a solution; the contenders aim to win the polemical exchange, not to find the truth.

Controversies stand in the middle between discussions and disputes, for they can begin with a concrete problem that could actually lead to a "true" solution, but they soon broaden to far-reaching problems and basic divergencies. Controversies deal not only with contrary attitudes and preferences—just like disputes—but also with divergencies concerning the methods to gain knowledge. In controversies, the contenders gather arguments from widely differing epistemological positions without distinguishing between logical or rational arguments and, on the other hand, meanings, hypotheses, and attitudes. They mirror a broad range of facts and goals, of judgements and methods, and aim to convince the other and / or the public, rather than to solve a problem.[5] Controversies concern

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Klausnitzer and Carlos Spoerhase (eds.), *Kontroversen in der Literaturtheorie / Literaturtheorie in der Kontroverse* (Bern et al. 2007), 49–92. Spoerhase narrows the concept of controversy to academic controversies only. This does not seem helpful for analyzing historical controversies, especially in periods when one cannot distinguish exactly between academic and non-academic knowledge. On academic/scientific controversies, see Peter Machamer, Marcello Pera and Aristides Baltas (eds.), *Scientific Controversies* (New York et al. 2000) and especially on Leibniz's ars disputandi Marcelo Dascal, 'Introductory Essay', in id. (ed.), *Gottfried Wilhelm Leibniz. The Art of Controversies* (Dordrecht 2008), xix–lxxii.

[3] On parallels to Aristotle, see Aristoteles, 'Topik', transl. by Eugen Rolfes, in Aristoteles, *Philosophische Schriften in sechs Bänden* (Hamburg 1995), vol. 2, 100a 18–101a 5. Dascal's differentiation is based upon the assumption of "Idealtypen" sensu Max Weber. Cf. Dascal 1996 (note 2), 22ff.

[4] Ibid., 21.

[5] Ibid., 22; Spoerhase 2007 (note 2), 70. Such forms of polemical exchange were characteristic of the early Enlightenment yet. See Frank Grunert, '"Händel mit Herrn Hector Gottfried Masio". Zur Pragmatik des Streits in den Kontroversen mit dem Kopenhagener Hofprediger', in Ursula Goldenbaum (ed.), *Appell an das Publikum. Die öffentliche Debatte in der deutschen Aufklärung, 1687–1796* (Berlin 2004), vol. 1, 119–174: 166ff.

areas in which systematic, standardized knowledge rarely seems possible, areas in which inter-disciplinary and personal hierarchies are questionable, areas in which traditionally arranged forms of exchange are being changed, foiled or even dissolved, areas in which presenting an argument, or representing oneself, takes on significant importance. Controversies can hardly be integrated in a traditional history of scientific progress when "progress" is understood as a process of expanding knowledge on the basis of methods leading towards certainty. Controversies deal with areas of applicability for hypotheses. Thus, they contribute somewhat indirectly to the expansion of knowledge, but only along lines of the reservation expressed by Georg Christoph Lichtenberg: "Could this not be different?"[6] Nevertheless—or perhaps even therefore—it is argued here that it is the form of a controversy that becomes the impetus for enlightened practice of knowledge.

This article will attempt to demonstrate that two polemical exchanges Albrecht Haller had were controversies of this sort, and that they were not (scientific) discussions dealing with and clarifying a scientific topic only.[7] There is also another aspect to these controversies: Enlightenment can hardly be attributed only to certain individuals. Some people who appear to represent enlightened avant-garde thinking at one point may at another point in a controversy appear to be narrow-minded preservers of ancient traditions.[8]

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[6] See Albrecht Schöne, *Aufklärung aus dem Geist der Experimentalphysik Lichtenbergsche Konjunktive* (München 1982), 122. This is how Schöne paraphrases the abbreviation "?L." which Lichtenberg often uses in his comments on Johann Christian Polycarp Erxleben's *Anfangsgründe der Naturlehre*. Erxleben also highlights the importance of hypotheses for physics. Cf. Andreas Kleinert, 'Physik zwischen Aufklärung und Romantik. Die "Anfangsgründe der Naturlehre" von Erxleben und Lichtenberg', in Bernhard Fabian, Wilhelm Schmidt-Biggemann and Rudolf Vierhaus (eds.), *Deutschlands kulturelle Entfaltung. Die Neubestimmung des Menschen* (München 1980), 99–113: 102.

[7] See Hubert Steinke, 'Der Patron im Netz. Die Rolle des Briefwechsels in wissenschaftlichen Kontroversen', in Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005), 441–462.

[8] Wolfgang Proß, 'Haller und die Aufklärung', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008), 415–458: 420 points out that Haller did not always take up the most advanced positions of his time in every area.

Albrecht Haller versus Georg Daniel Coschwitz

Let us first analyse the controversy Haller had with the Halle anatomist Georg Daniel Coschwitz from 1724 to 1729. As regards content, the polemical exchange was ignited by Coschwitz, who maintained that he had detected a new saliva channel in the human tongue. Johann Georg Duvernoy, Professor of anatomy in Tübingen, along with his young student Albrecht Haller, tried to refute Coschwitz. Haller himself added more objections in his dissertation. Coschwitz once more defended his argument in another treatise, but he was wrong in the end. What Coschwitz thought to be a saliva channel was just the antrum of a venule.[9]

On 26 July 1726, Albrecht Haller, a seventeen-year old student of medicine on an educational journey, arrived at Halle to call on several professors at Friedrichs University. Haller was well aware of the reputation of the most important German university of the early Enlightenment. He wrote in his diary after arriving in Halle that it was the "most prestigious university of Germany".[10] His first path in Halle led him to see Georg Daniel Coschwitz, the 47-year-old founder of the theatrum anatomicum in Halle, whose supposed findings Haller had publicly disputed in Tübingen

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[9] Georg Daniel Coschwitz, *Ductus salivalis novus, per glandulas maxillares, sublinguales, linguamque excurrens, cum vasis lympathicis variis communicans, et in lingua locum excretionis habens. Nuperrime detectus, et publice adjectis figuris Æneis exhibitus â Georgio, Daniel Coschw., Med. Doct. Ejusdemque in Alma Fridericiana Halensi Prof. Publ. Ordin. et Potentiss. Poruss. Regis per Comitatum Mansfeldens: et apud Palatinos Halenses Pysico* (Halle 1724); Johann Georg Duvernoy and Albrecht Haller, *Viri Clarissimi Georgii Daniel Coschw., Prof. Halens. Ductum Salivalem Novum, per Glandulas Maxillares, sublinguales, Linguamque excurrentem, &c. cum figuris Æneis. Gratioso Facultatis Medicæ consensio Disquisitioni Anatomicæ submittunt, Præses Johannes Georgius Du Vernoi, Med. D. & in Univ. Tubingensi Prof. Publ. & Respondens Albertus Haller, Helveto-Bernas* (Tübingen 1725); Albrecht Haller, *Dissertatio inauguralis sistens experimenta et dubia circa ductum salivalem novum Coschwizianum quam pro gradu Doctoratus Eruditorum Examini submittit Albertus Haller, Helveto-Bernas* (Leiden 1727); Georg Daniel Coschwitz, *Ductus salivalis novus, pluribus observationibus illustratus confirmatusque, simulatque a contradictionibus vindicatus et liberatus sev continuatio observationum circa hoc negotium hactenus institutarum cum necessaria brevique responsione ad disquisitionem Do. du Vernoi atque Halleri* (Halle 1729). On the aspects concerning the history of medicine, see Heinz Balmer, *Albrecht von Haller* (Bern 1977), 9ff. and at length Thomas Breitbach, *Albrecht Haller und der Coschwizsche Speichelgang. Die Entlarvung einer Fehlentdeckung*, dissertation in medicine, University of Bern, 1991, especially 58ff. For the following, see also Rainer Godel, 'Anatomische Evidenz. Die Debatte zwischen Albecht Haller und Georg Daniel Coschwitz', in Tanja van Hoorn and Yvonne Wübben (eds.), *"Allerhand nützliche Versuche". Empirische Wissenskultur in Halle und Göttingen (1720–1750)* (Hannover 2009), 41–63.

[10] "vornehmste Hohe Schule von Teutschland". Albrecht Haller, *Tagebücher seiner Reisen nach Deutschland, Holland und England 1723–1727*, ed. by Ludwig Hirzel (Leipzig 1883), 75.

the year before. Haller, in his diary, reached a distinct verdict: Coschwitz's lecture on physiology contained nothing but "well-known topics, with some pranks".[11] "He does not really have a concept of what is happening in Europe in anatomicis, and he does not seem to have read enough."[12] This verdict by a seventeen-year old student may sound rather presumptuous, but the enlightened attitude is clearly visible: The hierarchy in effect for his contemporaries does not apply to Haller. He even criticizes Christian Thomasius and Friedrich Hoffmann in his diary. The young student Haller took the liberty of arguing eye-to-eye with renowned researchers. For him, empirical evidence was more important than the prejudice of authority, the *praeiudicium auctoritatis*.

For Haller, empirical evidence, and not the traditional reputation of well-known researchers, legitimized scholarship. This was one of the core differences between Haller and Coschwitz: the question of how scholarship can be legitimized. Let us take a brief look at the starting-point of this controversy, the 1724 book by Coschwitz. Coschwitz, in an elaborate foreword, justifies his method. He begins by quoting a Latin proverb: "Diem a die doceri."[13] This proverb, Coschwitz argued, also applies to scientific progress. According to Coschwitz, one needs to transfer well-established knowledge to other areas in which one does not yet have sufficient knowledge at one's disposal. But the researcher is also obliged to gather new empirical evidence in these areas. Thus, Coschwitz tried to preserve the value of tradition alongside the new empirical research. In this context, he quoted the dichotomy of microcosm and macrocosm that had been revived by Paracelsus and used by Coschwitz's teacher, Georg Ernst Stahl. Coschwitz transferred this metaphorically to the detailed research that still had to be done in anatomy.[14] The Halle professor of anatomy claimed that there were two different areas of knowledge: one in which reliable

[11] "nichts als bekannte Sachen, mit einigen Poßen". Ibid., 77f.

[12] "Er hat keinen rechten Begrif von dem, was in Europa in anatomicis vorgeht, scheint auch nicht genung gelesen zu haben." Ibid., 76.

[13] "Each day learns from the day before it." Coschwitz 1724 (note 9), 3. This phrase or similar ones were common proverbs in the Middle Ages and in the early modern period. See *Proverbia sententiaeque latinitatis medii ac recentioris aevi. Nova series. Lateinische Sprichwörter und Sentenzen des Mittelalters und der frühen Neuzeit in alphabetischer Anordnung. Neue Reihe*, ed. by Paul Gerhard Schmidt (Göttingen 1982), part 7, A–G: 583, no. 36267 and *Proverbia sententiaeque latinitatis medii aevi*, ed. by Hans Walther (Göttingen 1963), part 1, A–E: 733, no. 5946.

[14] On Stahl's method of teaching, see Sergio Moravia, 'From Homme Machine to Homme Sensible: Changing Eighteenth-Century Models of Man's Image', *Journal of the History of Ideas* 39 (1978), 45–60: 49ff.

knowledge already exists because of tradition—and this knowledge needs to be acknowledged—and one where further research is useful, following on what is already known. But Coschwitz by no means dispensed with empirical research and with its expanded and detailed representation. Meticulously, he recounted how he scrutinized the tongue of a drowned female child murderer on 9 December 1723.[15] In this case, the contemporary debate about the morality of women's autopsies did not have an impact on Coschwitz.[16] Besides this autopsy, Coschwitz referred to animal dissections, and he made a point of naming witnesses. All together, Coschwitz used two strategies to legitimize his research: The methodological frame of the foreword allowed for integration of the empirical evidence from the researcher's observations into a traditional model of science.

Duvernoy's and Haller's answer in Haller's valedictory address, which was held in Tübingen in 1725, stresses more explicitly the conditions of the possibility of empirical evidence and criticizes Coschwitz for disregarding them. Coschwitz is criticized because he analyzed the body of a person who was not in good health (before her death). The woman had had a struma.[17] At the same time, Duvernoy and Haller maintained it was an old and well-established tradition to work with healthy bodies only. Duvernoy and Haller not only criticized Coschwitz's approach,[18] but also undermined the arguments with which Coschwitz had tried to connect empirical research and traditional lore. Now, Coschwitz's methodological plea for and with tradition seemed to contrast with the empirical approach he used himself.

Haller's *dissertatio inauguralis* (1727) eventually offered more and more adequate empirical research. This was not least of all due to the fact that Haller argued that Coschwitz had used only one human body in order to create his hypothesis and to posit a new finding.[19] Haller was careful to explain the conditions of an experiment that produces evidence. In particular, he referred to the quantity, quality, and processes of sections and injections, for which he used the most advanced preparation techniques.

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[15] See Coschwitz 1724 (note 9), 7ff.

[16] See Friedrich Hoffmann, *Kurtzer und eigentlicher Entwurff Von Dem Nutzen der Anatomie in Erkäntniß Gottes und seiner selbsten bey einer Anatomischen Untersuchung Eines weiblichen Cörpers* (Halle, s.a.).

[17] Duvernoy and Haller 1725 (note 9), 6.

[18] For other issues, see Breitbach 1991 (note 9), 35.

[19] See Hubert Steinke, 'Anatomie und Physiologie', in Steinke, Boschung and Proß 2008 (note 8), 226–254: 228.

Haller was concerned with Coschwitz's arguments in detail, and he tried to document, step by step, that Coschwitz did not work properly in accordance with the conditions of empirical research.

But reference to empirical evidence reaches its limits in this controversy. When Haller saw Coschwitz in Halle, the professor showed him the anatomical preparations he had kept from his experiments. Haller, in his diary, related that he and Coschwitz both looked closely at the baboon's tongue Coschwitz showed him. But Haller did not see what Coschwitz believed he saw: "there is no arch to be seen".[20]

Coschwitz, in his 1724 book, had notably often referred to his being an eye witness and to the evidence of individual observation.[21] When describing his autopsies, Coschwitz frequently uses the verb "videre", often in first person singular past tense, without alluding to the question of whether the senses might delude or whether the conclusions he drew were hermeneutically certain.[22] Haller, however, would not exclude later that the picture generated in the human mind can differ from the one that is generated through the process of perception in a mechanical way.[23]

But what can be done in this case? What can be done when two observers, standing in front of an object at the same time and at the same place, do not agree on the question of whether something that one of them maintains he sees and the other maintains he does not see really exists? Nota bene: this is not about a conclusion but about the object itself, in which Haller does not see an "arch". What can be done if it is not possible to have a scientific discussion since both contenders refer to propositions of normative validity? What can be done when both contenders cite independent observations made by other scientists in order to back their position? Coschwitz cited Kulmus and Budeus, while Haller cited Abraham Vater in the first place, followed by other anatomists.

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[20] "da ist kein Bogen zu sehen." Haller 1883 (note 10), 76.

[21] On contemporary criticism of the evidence of the sensual, and above all visual perception, see Ulrike Zeuch, *Die Umkehr der Sinneshierarchie. Herder und die Aufwertung des Tastsinns seit der Frühen Neuzeit* (Tübingen 2000), 71ff. On criteria of evidence in the early modern period, see Ian Maclean, *Logic, Signs and Nature in the Renaissance. The Case of the Learned Medicine* (Cambridge 2002), 196ff.

[22] See Coschwitz's detailed report on the experiments, including exact time and place of the experiments: Coschwitz 1724 (note 9), 7ff.

[23] Albrecht von Haller, *Grundriß der Physiologie für Vorlesungen. Nach der vierten lateinischen … Ausgabe aufs neue übersetzt, und mit Anmerkungen versehen durch Herrn Hofrath Sömmering in Mainz, mit einigen Anmerkungen begleitet und besorgt von P.F. Meckel* (Berlin 1788), § 548, 416. Cf. Walter Emil Philipp Beyer, *Albrecht von Haller (1708–1777) und der Vorgang des Sehens*, dissertation, University of Bonn, 1983, 347.

Both contenders affirmed their good conduct. In the final passage of his 1727 dissertation, Haller credited himself with a motivation that cannot be called into question. He pretended to have acted "with a sincere love for truth".[24] On the other hand, he assumed that Coschwitz was emotionally involved. He advised him that it would be better to accept the results that Haller had reported, "not sorely", and that he should conduct further debates—if he intended to conduct them at all—"without bitterness".[25] Even famous men were sometimes obsessed with errors. Haller was trying to legitimize his attack on a colleague's authority by admonishing him to scientific evidence, calmness, and logic.

But Coschwitz, in his reply, claimed that it was only Haller who had breached what was known as the code of behaviour of a good scientist. When Haller visited him in Halle, Coschwitz argued, he did not explain that he was the one who was the respondent in the Tübingen disputation against Coschwitz's findings. Haller is even said not to have mentioned in the conversation they had in Halle in 1726 that he did not agree with Coschwitz. Coschwitz contrasted Haller's conduct with his own "honesty", "sincerity", and "integrity".[26] He blamed Haller for representing himself as a noninvolved, private person. Haller is said to have "given the appearance of Helvetian faithfulness",[27] misinterpreting everything Coschwitz told him to the disadvantage of Coschwitz, but also to have consciously related falsely. This, according to Coschwitz, was unfair and dishonest.[28] And: Someone who has proved himself dishonest in personal encounters can in no case claim to be considered honest on scientific topics. According to Coschwitz, a good scientist must have trustworthiness—"fidelitas"—and must prove this by accurate work. This is one of the methodological premises Coschwitz states already in his 1724 text.[29] Personal integrity only vouches, in the end, for the reliability of the observations someone professes to have made.

These arguments were not completely new to Haller. Duvernoy, already in his message of congratulations which, according to the pattern of disputations in early modern times, enthusiastically praised Haller's research, pointed out to Haller the dangers that threaten when someone

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[24] "ex sincero veritatis amore". Haller 1727 (note 9), 91.
[25] "non aegre"—"absque amarore". Ibid.
[26] "honestas", "sinceritas", "integritas". Coschwitz 1729 (note 9), 32.
[27] "sub fidei helveticae". Ibid.
[28] "Haud enim sincere mecum agit, . . . quando . . . contra veritatem refert . . ." Ibid.
[29] Cf. Coschwitz 1724 (note 9), 6ff.

deviates from common forms of scientific discussion. Duvernoy prepared his student for several aspects of academic life, in which one needs to face attacks if one lacks "suavitas", "agreeableness" in his writings. The only way to deal with these, is, according to Duvernoy, to submerge oneself in "such a dangereous sea", to prepare oneself soundly, to act in a well-adjusted manner, to research precisely and continuously, and to wait for success and acknowledgment patiently.[30]

The exchange between Haller and Coschwitz proved to be more than just a discussion about a saliva channel. The core aspects of the controversy concerned central elements of the enlightened practice of knowledge, topics that cannot be resolved through a discussion intended to lead to an ultimate truth. For whether self-attribution or attribution by others is the case is no longer a question of scientific evidence.

Albrecht Haller versus Julien Offray de La Mettrie

As regards the history of science, the starting point of the controversy between Haller and Julien Offray de La Mettrie was a serious conflict about the authorship, interpretation, and consequences of Haller's distinction between irritability and sensibility.[31] But the extensive debate goes far beyond this. The present article will be restricted to one core aspect: By contrast with what Haller wanted and definitively intended, the controversy affected the possibility of knowledge in areas that cannot lead to definite scientific truth.

At the beginning of this controversy is a translation: From 1743 on, La Mettrie translated Boerhaave's lectures on physiology into French, and he added some comments of his own.[32] The template for this translation was the Latin edition, edited and annotated by Haller.[33] In some passages of the French edition, it is not clear whether the comments are Haller's or

[30] Cf. Duvernoy and Haller 1725 (note 9), 22.

[31] On this controversy, see Hubert Steinke, *Irritating Experiments. Haller's Concept and the European Controversy on Irritability and Sensibility, 1750–90* (Amsterdam and New York 2005), 7 and especially 194ff. on the physiological aspects of this debate.

[32] Hermann Boerhaave, *Institutions de Médicine. 2nd edition, avec un commentaire. Par M. de La Mettrie* (Paris 1743–1750), 8 vols.

[33] Hermann Boerhaave, *Praelectiones adacemicae in proprias institutiones rei medicae editit et notas addidit Albertus Haller* (Göttingen 1739–1744), 7 vols.

La Mettrie's.[34] Haller was alarmed. Not completely without reason, he sensed plagiarism—a severe aberration from normal scientific conduct.[35]

One brief remark must be made concerning the contents of this controversy: Haller's thesis of the irritability of the muscles, which he developed at length in an independent publication later, expatiated throughout the scientific community, not least through La Mettrie's translation. In Boerhaave's "Praelectiones academicae in proprias institutiones",[36] Haller, in a comment, mentioned this theory of irritability for the first time. La Mettrie adopted this passage, but he did not indicate that this is Haller's comment.[37] Moreover, La Mettrie quoted several other researchers such as Nicolas Steno, Thomas Willis, and Alfonso Borelli who had been working on this topic—names that Haller did not mention.[38]

However, La Mettrie's "Histoire naturelle de l'âme" (1745) escalated the controversy. For now the Breton, in Haller's view, had not only deviated from common scientific practice but also spread scepticism and doubt about the truth of the faith on which Haller's theses were based. In his response, Haller took up an argument Coschwitz had used against him 18 years earlier: Someone who lacks virtue and decency cannot be a good scientist. Haller wrote a review of La Mettrie's "Histoire naturelle". After scrupulously itemizing all the passages La Mettrie is said to have plagiarized, Haller drew the conclusion: "After (sic) so much theft, it is easy to see how much is lacking in the inner strength of the freethinker."[39] Haller not only criticizes La Mettrie for being sceptical about the truth of faith. La Mettrie forfeits his reputation as a scientist completely, according to Haller, by aspersively associating others—Boerhaave and Haller—with libertine ideas.[40] Moreover, Haller considered the existence and the work

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[34] Wellman argues that the comments by Haller and La Mettrie differ "in both style and substance. La Mettrie did not simply replicate a disjointed series of Latin footnotes. Instead he provided a connected commentary written in French in a conversational style . . ." Kathleen Wellman, *La Mettrie. Medicine, Philosophy, and Enlightenment* (Durham 1992), 107.

[35] See also Birgit Christensen, *Ironie und Skepsis. Das offene Wissenschafts- und Weltverständnis bei Julien Offray de La Mettrie* (Würzburg 1996), 151ff.; Steinke 2005 (note 31), 194.

[36] Boerhaave 1739–1744 (note 33), II: 429.

[37] See Christensen 1996 (note 35), 152.

[38] Ibid., 152ff.

[39] "Nach einer solchen Menge von Diebstählen sieht man leicht, wie schlecht die innre Stärke des Freydenkers ist." Albrecht von Haller, [Rezension von Julien Offray de La Mettrie Histoire naturelle de l'Âme], *Göttingische Zeitungen von Gelehrten Sachen* (1747), 413–415: 414.

[40] On freethinking in Germany, see Günter Gawlick, 'Freidenker', in Werner Schneiders (ed.), *Lexikon der Aufklärung. Deutschland und Europa* (München 1995), 130–132, and recent research on radical Enlightenment: Martin Mulsow, *Moderne aus dem Untergrund.*

of God as a basic postulate for the anchoring of natural science in God's will.[41] Haller became aware of a danger—the suspicion of atheism—and he tried to do everything to avoid raising this suspicion.[42] In his review on La Mettrie, we can find a sentence in which all the issues culminate: "The author misuses the comments of the well-meaning Boerhaave, whose Christianity has a firm basis, and, in particular, Mr. Haller's interpretations of those comments. The author has evidently merely copied many pages, without any mention of the source from which he took them."[43] Haller finds himself in a predicament. He must claim that he is the author of many passages in La Mettrie's translation, but that he is not the author of exactly those passages in which La Mettrie expresses free-thinking consequences.

Moreover, La Mettrie develops his materialist arguments on the basis of an extensive (and defective) interpretation of Haller's theory of irritability. The issues of this controversy are no longer the scientific correctness of La Mettrie's arguments and scientific progress. Although Haller will later criticize La Mettrie for not doing experiments of his own,[44] La Mettrie's results, according to Haller, did not need to be a subject for discussion in any event: that "the human being is nothing more than an animal—a kind of monkey"[45] does not even need to be discussed. Haller stresses common, good human conduct—it is forbidden to plagiarize, by which he

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Radikale Frühaufklärung in Deutschland (Hamburg 2002); Jonathan Israel, *Radical Enlightenment. Philosophy and the Making of Modernity* (Oxford 2001); id., *Enlightenment Contested. Philosophy, Modernity, and the Emancipation of Man 1670–1752* (Oxford 2006); and, recently, Kay Zenker, *Libertas philosophandi. Zur Theorie und Praxis der Denkfreiheit in der deutschen Aufklärung*, dissertation, University of Münster, 2010.

41 See Steinke 2005 (note 31), 11.

42 On theological objections that led to the ban on the book, see Claudia Becker, 'Einleitung', in Julien Offray de La Mettrie, *L'homme machine. Die Maschine Mensch*, transl. and ed. by Claudia Becker (Hamburg 1990), VII–XVIII: VIIIf.; Haller 1747 (note 39), 413.

43 "Der V. mißbraucht dabey des wohlmeinenden und in seinem Christenthum beydes ernsthaften und gründlichen Boerhaave Anmerkungen, und ins besondere des Herrn Hallers Auslegung derselben von welchen er sichtbarlich viele Seiten bloß abgeschrieben hat, ohne der Quelle im geringsten zu erwehnen, woraus er geschöpfet hat." Haller 1747 (note 38), 413. Knabe rightly points to the fact that the critique of La Mettrie does not begin with what he calls "sachliche Gründe", but by critizing La Mettrie for his lack of faith. See Peter-Eckhard Knabe, *Die Rezeption der französischen Aufklärung in den Göttingischen Gelehrten Anzeigen* (Frankfurt/M. 1978), 127.

44 See Albrecht von Haller, *Abhandlung des Herrn von Haller von den empfindlichen und reizbaren Teilen des menschlichen Leibes* (Leipzig 1756), 39; Ursula Pia Jauch, *Jenseits der Maschine. Philosophie, Ironie und Ästhetik bei Julien Offray de La Mettrie, 1709–1751* (München 1998), 273.

45 "der Mensch nichts als ein Thier, und eine Art von Affen sey". Haller 1747 (note 39), 415.

accentuates scientific validity—and it is forbidden to misuse arguments. And Haller stresses the Christian faith, which cannot be disputed.

La Mettrie, in his answer, provocatively returns to Haller's allegation of plagiarism.[46] By dedicating his essay "L'homme machine" to Haller of all people, he represented himself as a close friend and student of Haller. On the other hand, he designed this dedication to be a distinct rejection of the habits of academic discourse and, at the same time, a work in praise of Haller the poet—and not the scientist. La Mettrie begins with the ambiguous sentence: "This is by no means a dedication. You rise very much above all eulogies I could deliver to you, and I know of nothing so useless and boring as an academic treatise."[47] Whereas the beginning of the sentence follows the rhetorical pattern that prescribes "delight as expected" for a eulogy,[48] a pattern that feigns a teacher-student-relation, the second half of the sentence turns out to be an affront to Haller the academic by denying the usefulness and entertainment value of all academic texts (including his own).

In what follows, La Mettrie maintains that Haller is an expert in a completely different area: the "voluptuousness of the study", the "volupté de l'Etude".[49] In semantic terms, this is the implicit assumption of a dual pleasure, both erotic and intellectual. La Mettrie also refers to the "pleasure" he assumes he had when writing this treatise. Insidiously, La Mettrie refers to Haller himself at this point and namely his poems, which not infrequently use the same metaphors to evoke erotic or intellectual pleasure. "What is stirring in my breast? / Is it astonishment? is it lust? / Mild drives of silent muses, / Don't I feel you in my chest?"[50] With ironic allusions to this and to similar passages in Haller's poems, La Mettrie leaves the field of purely scientific discourse. This would not be so unusual for a

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[46] On this kind of argumentation by La Mettrie, see Knabe 1978 (note 43), 147. Jauch argues that La Mettrie was not interested in polemics but in differentiation. See Jauch 1998 (note 44), 263ff.

[47] "Ce n'est point ici une Dédicace; vous êtes fort au-dessus de tous les Eloges que je pourrois vous donner; et je ne connois rien de si inutile, ni de si fade, si ce n'est un Discours Académique." La Mettrie 1990 (note 42), 6.

[48] See Manfred Beetz, 'Vom erwartungsgemäßen Entzücken des Einführungsredners', *Rhetorik* 4 (1985), 29–45.

[49] See La Mettrie 1990 (note 42), 7.

[50] "Was reget sich in meinem Busen? / Ist es Verwundrung? ist es Lust? / Gelinde Triebe stiller Musen, / Fühl ich euch nicht in meiner Brust?" This quote is an extract from Haller's eulogy to the grand opening of the University of Göttingen. Albrecht von Haller, 'Ueber das Einweihungs-Fest der Göttingischen hohen Schule. 1737', in id., *Versuch Schweizerischer Gedichte* (reprint of eleventh edn. Bern 1777, Zürich, Hildesheim and New York 2006), 231, verses 1–4.

dedication if La Mettrie did not connect this deviation from the standard with the pretension that both he and Haller shared a common interest in speculative philosophy particularly, which is said to be the only science to evoke these feelings.[51] A stronger contrast to what Ursula Pia Jauch calls Haller's "reductive rationalism" can hardly be imagined.[52] Whereas for Haller, physiology and anatomy are the relevant "sciences of human nature", as P.F. Meckel records,[53] for La Mettrie philosophical medicine precedes all other disciplines in the hierarchy of the sciences, because it enables human beings to know and to heal the "whole person".[54] Thus, a basic difference between Haller and La Mettrie consists in the ranking of academic disciplines and extra-academic knowledge. This is no "Conflict of the Faculties"; rather there is a conflict about areas of knowledge and its methods.

As regards this form of anthropological knowledge, La Mettrie declares other criteria for evidence to be in effect. He argues within an area of truth that is not final: "If the consequences the author draws [on this matter] are dangerous, one should recall that they are based upon nothing more than a hypothesis."[55] The need for hypotheses and the multiplicity of truth are due to the object of his analysis, to the "nature of humankind". In the "Discours Préliminaire" enlightenment seems to be impossible since anthropological conditions obtain: Prejudices from childhood days may never be destroyed.[56]

In this anthropological area, one does not need to confine oneself to pure speculation; judgements are possible, albeit contingent ones. After the core thesis "The human being is a machine", La Mettrie gives a methodological explanation: "The human being is a machine composed in a way that makes it impossible to envisage a clear idea of it in the beginning."[57] La Mettrie proclaims a method that does not relate to speculation in the area of ignorance, but that uses empirically ascertained results in order to expand from there into hypotheses about the nature of human beings.

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[51] "De toutes les Attractions de la Nature, la plus forte, du moins pour moi, comme pour vous, cher H., c'est celle de la Philosophie." La Mettrie 1990 (note 42), 8.

[52] See Jauch 1998 (note 44), 255.

[53] "Lehre von der Natur des Menschen", cf. P.F. Meckel, 'Vorrede', in Haller 1788 (note 23), V.

[54] See Christensen 1996 (note 35), 139.

[55] "Si les conséquences, que l'Auteur en tire, sont dangereuses, qu'on se souvienne qu'elles n'ont qu'une Hypothèse pour fondement." La Mettrie 1990 (note 42), 4.

[56] See Jauch 1998 (note 44), 265.

[57] "L'Homme est une Machine si composée, qu'il est impossible de s'en faire d'abord une idée claire . . ." La Mettrie 1990 (note 42), 26.

While going through the organs, one needs to "unravel the mind", in order to achieve the "highest degree of probability" in judgements on the nature of human beings.[58]

La Mettrie makes a plea for drawing epistemological—or better: epistemo-practical—consequences from insight into the limits of the human cognitive faculty, the diverging accessibility of different areas of knowledge, and the fact that they also differ in allowing truth in the end. La Mettrie makes a plea—if an anachronism may be allowed—for the humanities, but for a methodologically based kind of humanities. "Break the chain of your prejudices, arm yourself with the torch of experience, and you will honour nature as it deserves rather than drawing conclusions from the ignorance in which nature has left you."[59] In this area of ignorance or uncertain knowledge, truth is always bound to the possibility of error, about which one needs to argue publicly: "It is not enough that a savant does research on nature and on truth; he must dare to articulate it for the benefit of the small number of those who are willing and able to think."[60] "L'homme machine" ends with the famous invitation to controversies: "Here is my system, or rather the truth if I do not err. . . . Now, argue who wants to."[61]

Haller, on the other hand, does not at all consider hypotheses illegitimate. In the Buffon preface "Über den Nutzen der Hypothesen" [On the usefulness of hypotheses], he stresses the use of competing hypotheses in relation to scientific progress. If nothing else, they are said to have a psychological value because they incite researchers to compete for glory and honour.[62] Thus, controversies result from anthropological conditions: They stem from the natural pride and the quest for glory that affect every human being. But there are also intrinsic scientific reasons for hypotheses: In his "Elementa physiologiæ corporis humani", Haller states that

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[58] See ibid., 27.

[59] "Brisez la chaîne de vos préjugés; armez-vous du flambeau de l'Expérience, et vous ferez à la Nature l'Honneur qu'elle merite; au lieu de rien conclure à son désavantage, de l'ignorance, où elle vous a laissés." Ibid., 132.

[60] Ibid., 20.

[61] "Voilà mon Systême, ou plutôt la Vérité, si je ne me trompe fort. . . . Dispute à présent qui voudra!" Ibid., 138. On the function of arguments in La Mettrie, see Christensen 1996 (note 35), 13ff.

[62] See also Proß 2008 (note 8), 428; Albrecht von Haller, 'Vorrede zum ersten Theile der allgemeinen "Historie der Natur" [über den Nutzen der Hypothesen; 1750]', in id., *Sammlung kleiner Hallerischer Schriften* (second edn., Bern 1772), 3 vols., I: 50 and 68ff. Cf. also Otto Sonntag and Hubert Steinke, 'Der Forscher und Gelehrte', in Steinke, Boschung and Proß 2008 (note 8), 317–346: 339.

he now, when dealing with the inner senses, needs to enter the "realm of hypotheses and conjectures".[63] This is not inconvenient: Especially in the pre-psychological "Seelenlehre" of the late Enlightenment, hypotheses were accepted as an important instrument for generating knowledge. Justus Christian Hennings, in his "Geschichte von den Seelen der Menschen und Thiere", writes: "To put it in one word, the 'Seelenlehre' is the right chair and residence for hypotheses."[64]

But the seminal difference between Haller and La Mettrie lies in the question of where the limits of truth and science are. Truth generated by reason only, which is at work when hypotheses are formulated, is, according to Haller, always subordinate to truth generated by experience.[65] Evidence achieved by the "knife" or the "microscope" is always superior to "speculations".[66] "The correct method of searching for truth" is to dispense with what Haller calls "romances"—fabricated stories—and, instead, accumulate empirical observation.[67] When our ideas, since they come from our perception, converge with the things themselves, we have caught the truth.[68] This may seem like a rather simplistic epistemological model: For Haller, enlightenment means achieving truth in all the areas that can be the object of empirical research. Hypotheses only fill in "the blanks of

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[63] "regnum hypothesium & conjecturarum". Albrecht von Haller, *Elementa physiologiæ corporis humani. Tomus quintus. Sensus externi interni* (Lausannae 1763), 529. See also Steinke 2005 (note 31), 197.

[64] "Mit einem Worte, die Seelenlehre ist der rechte Sitz und Residenz der Hypothesen." Justus Christian Hennings, *Geschichte von den Seelen der Menschen und Thiere* (Leipzig 1777), XV.

[65] See Richard Toellner, *Albrecht von Haller. Über die Einheit im Denken des letzten Universalgelehrten* (Wiesbaden 1971), 115ff. Haller's epistemology shares some aspects with the anthropological discourse without retracing it towards the direction of probabilism. On Haller's epistemology, see Rainer Godel, *Vorurteil—Anthropologie—Literatur. Der Vorurteilsdiskurs als Modus der Selbstaufklärung im 18. Jahrhundert* (Tübingen 2007), 246.

[66] See Albrecht von Haller, *Von den empfindlichen und reizbaren Teilen des menschlichen Körpers*, ed. by Karl Sudhoff (first edn. Leipzig 1756, Leipzig 1922), 13. Cf. Christensen 1996 (note 35), 138; Proß 2008 (note 8), 428ff.

[67] Albrecht von Haller, 'Physiologie', in *Supplément à l'Encyclopédie, ou Dictionnaire Raisonné des Sciences* (Amsterdam 1777), vol. 4, 349. See also Lutz Danneberg, *Die Anatomie des Text-Körpers und Natur-Körpers. Das Lesen im liber naturalis und supernaturalis* (Berlin and New York 2003), 70.

[68] "Verum dicimus nos tenere, quando ideae nostrae cum rebus ipsis conveniunt, quarum ex perceptione natae sunt." Haller 1763 (note 53), 562.

truth".[69] They are the instruments that can lead one to truth in the areas where truth has not yet been found.[70]

Thus, at the centre of the controversy between Haller and La Mettrie, there is a methodological debate about the question of whether and how knowledge is possible in areas where the experience of the researcher does not suffice to arrive at true evidence. At the centre of the controversy, there is the question of whether it is legitimate to cross the border towards such "extra-scientific" areas that require other forms of knowledge or ignorance when driven by sceptical doubts and hypotheses. Is it allowed to formulate hypotheses in areas which are not "scientific", but in which truths—truths of faith—seem to be evident? Consistently, Haller later answers this question in his theological writings.[71] The controversy is about crossing borders. La Mettrie ironically represents Haller as someone who crosses borders. In the German version of La Mettrie's *Kunst, Wollust zu empfinden* (1751), La Mettrie adds another dedication to Haller. He addresses Haller as the teacher who taught him lust: "This name alone is, for the expert, the epitome of the art of love and voluptuousness."[72] La Mettrie is trying to make Haller implausible, as Haller is said not to follow the truth of faith and morality in his own life. Therefore, La Mettrie argues that Haller's plea for excluding these truths from the process of research is not convincing.[73] The controversy has become a controversy over credibility where probabilities are negotiated.[74]

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[69] "Lüken (sic) des Wahren". Albrecht von Haller, 'Vorrede zum Ersten Theile der allgemeinen Historie der Natur', in *Sammlung kleiner Hallerischer Schriften* (second edn., Bern 1772), part 1, 72. Cf. Toellner 1971 (note 65), 116ff.

[70] See ibid., 60.

[71] See Steinke 2005 (note 31), 196.

[72] "Dieser Name allein ist dem Kundigen der Inbegriff von Liebeskunst und Wollust." Julien Offray de La Mettrie, *Die Kunst, Wollust zu empfinden*, ed. by Bernd A. Laska (Nürnberg 1987), 5. La Mettrie refers above all to Haller's *Ode an Doris*.

[73] On the controversy on Haller's assumed double moral standard, see Jauch 1998 (note 44), 258.

[74] The controversy has not yet come to an end. Due to the restricted length of this paper, I cannot deal with the following texts in detail. In *Le petit homme à longue queue* (1751), La Mettrie intensifies his polemics against the assumed immorality of Haller. Haller himself appealed to Maupertuis, the president of the Prussian academy, in order to silence La Mettrie. Cf. Haller 1772 (note 69), part 1, 317–341. After La Mettrie's untimely death, Haller ceased the controversy. See also Christoph Siegrist, *Albrecht von Haller* (Stuttgart 1967), 12; Karl S. Guthke, 'Haller, La Mettrie und die anonyme Schrift "L'homme plus que machine"', in id., *Wege zur Literatur. Studien zur deutschen Dichtungs- und Geistesgeschichte* (Bern and München 1967), 9–15.

Controversy as the Impetus of Enlightened Practice of Knowledge

Let us briefly recapitulate the core aspects of both controversies presented in this article:

1. Both controversies deal with issues that are not axiomatically evident. They are not in accordance with what contemporaries would expect to be "normal" science, since they re-define the scope and the instruments of trustworthiness. This forces the contenders in every case to substantiate and negotiate about why they are trustworthy agents of science.[75] The controversies are about how to legitimize norms and deviations from the norms.
2. Both controversies consist to a considerable extent of persuasive arguments that do not necessarily have to be logically consistent, conclusive, or true. Many communicative strategies aim to make readers believe that an argument is true and cannot be denied. Dascal calls such arguments, following Schopenhauer—and indirectly also Aristotle—"strategems".[76] They aim to represent a person and an argument with regard to the expectation of the recipients.
3. Both controversies digress from the form of scientific discussion that was well-established at that time. They vary the form of academic conduct and use non-scientific genres (La Mettrie, for example, makes extensive use of the satire) in order to convince the audience and/or the other.
4. Both controversies distinguish themselves by levelling the hierarchical pyramid that was common at that time. In both controversies, one of the contenders makes a claim to debate eye-to-eye with someone who actually outranks him. This may also apply to overturning the hierarchy of scientific areas and disciplines. This tendency, by the way, complies with the eventful history of the concept of "Kontroverse" that makes its way from the rhetorical to the juridical, the theological, and, finally to all disciplines.

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[75] Shapin uses the concept of "trustworthy agents" in a more concrete sense. See Steven Shapin, *A Social History of Truth. Civility and Science in Seventeenth-Century England* (Chicago and London 1994), xxv, 3ff., 11 and 22ff.

[76] See Dascal 1998 (note 2), 25ff.

Along with the increase in certain knowledge in the Enlightenment, unclear areas and ignorance expanded.[77] The growth of knowledge opened up areas of non-knowledge where knowledge could not be easily organized or where contingency had to be accepted as inevitable. These spaces in between become the issue and the point of attack for all the enlightened endeavours seeking knowledge and truth. But these in-between spaces determine enlightenment itself. Without prejudices, enlightenment loses its drive, as Moses Mendelssohn argues.[78] By the end of the eighteenth century, at the latest, contemporaries stressed that enlightenment was a process. Enlightenment could no longer be understood as the accumulation of rational, propositional knowledge, but had to be considered as a process of negotiation and of controversies that needed to learn how to integrate opposition. Johann Christoph Greiling, in 1795, for example, declined all one-sided definitions of enlightenment.[79] "Nichtwissen", "ignorance", "bêtise", "Schwärmerei", "préjugés", "Konjekturen" are not just the names for the Enlightenment's opposites; they also name the guideposts that gave the Enlightenment its specific profile. Enlightenment cannot be constructed as a purely rational endeavour, since it is always subject to the anthropological conditions (including the human ignorance) that limit and—at the same time—spur on our cognition. Enlightenment negotiates probabilities in controversies. The rivalry of standpoints is fertile, not an issue.[80] In these kinds of enlightened controversies, the contenders not only deal with knowledge that can lead to truth. Such controversies not only deal with the order of things, they deal with the order of ignorance. In this process, it is not the normal standard, not the disciplinal pattern,

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[77] See Hans Adler and Rainer Godel, 'Einleitung. Formen des Nichtwissens im Zeitalter des Fragens', in Hans Adler and Rainer Godel (eds.), *Formen des Nichtwissens der Aufklärung* (München 2010), 9–19; Proß 2008 (note 8), 415; Wolfgang Riedel, 'Erster Psychologismus. Umbau des Seelenbegriffs in der deutschen Spätaufklärung', in Jörn Garber and Heinz Thoma (eds.), *Zwischen Empirisierung und Konstruktionsleistung. Anthropologie im 18. Jahrhundert* (Tübingen 2004), 1–17.

[78] See Moses Mendelssohn, 'Öffentlicher und Privatgebrauch der Vernunft', in id., *Gesammelte Schriften. Jubiläumsausgabe*, vol. 8: *Schriften zum Judentum* (Stuttgart and Bad Cannstatt 1983), part 2, 225–229: 227.

[79] Johann Christoph Greiling, *Ideen zu einer künftigen Theorie der allgemeinen practischen Aufklärung* (Leipzig 1795), 4ff. One may also recall Ernst Cassirer's proposal to understand the Enlightenment as taking the form of a theoretical controversy. See Ernst Cassirer, *Die Philosophie der Aufklärung* (Hamburg 1998), XIII.

[80] See Proß 2008 (note 8), 417; see also Panajotis Kondylis, *Die Aufklärung im Rahmen des neuzeitlichen Rationalismus* (Stuttgart 1981), 56ff. Thomasius, by the way, narrows the limits of reasonable controversies because he prefers them to remain within the area in which truth and deceit can still be separated. See Grunert 2004 (note 5), 167.

that constitutes Enlightenment—it is the aberration.[81] Enlightenment is a process of debates on the conditions of the possibility of enlightenment. On this note, controversies such as the two presented in this article become the impetus of enlightenment. The era of the Enlightenment was not just an era of answers; it was an era of questions.[82]

[81] See Jauch 1998 (note 44), 16f.

[82] Claudia Brodsky uses the phrase "Zeitalter der Fragen" in a radio interview with Deutschlandfunk, "Studiozeit", 28 August 2008.

SECRET SAVANTS, SAVANT SECRETS: THE CONCEPT OF SCIENCE IN THE IMAGINATION OF EUROPEAN FREEMASONRY

Andreas Önnerfors

> Everybody takes his seat in the inner room or chamber, the only embellishment of which is a painting representing *Minerva* or the image of the goddess of wisdom lowered in a light cloud or sky, with some freemasons visible around her to which she points at the resolution of natural *Phenomena* beneath the proverb 'Under the guidance and in company of Wisdom, we are safe and protected on the most dangerous abysses and alleys'.
>
> —Relation Apologique et historique de la societé des Franc-Maçons, 1738[1]

The Relationship between Savant Culture and Freemasonry in the Eighteenth Century

This article investigates the conceptual relationship between educated culture and freemasonry in the eighteenth century. After its official inception in London in 1717, freemasonry spread within decades as one of the most popular if not paradigmatic forms of sociability, first within Britain, then to France and the rest of Europe and overseas colonies. Its transformation from a professional guild of stonemasons into a secret society, a society in private space, has occupied many previous scholars. Hitherto no definite or convincing explanation has been put forward regarding the reasons why freemasonry underwent this significant change. Certainly the

[1] J.G.D.M.F.M. [anonymous author], *Relation Apologique et Historique de la Societe des Franc-Maçons* (Dublin, false imprint, 1738), 54–55. This anonymous tract was put on the index and burnt at the stake by the Catholic inquisition in 1739 but already during the year of its appearance also translated at least to German and Swedish. *Gründliche Nachrichten von den Frey-Maurern* (Frankfurt/M. 1738), itself partly a translation from an English book, *Freemasons' Pocket Companion* of 1735 served most likely as the blueprint for the Swedish translation inserted in July and August 1738 as a supplement to the Swedish newspaper *Stockholms Post-Tidningar*, "Anmärckningar Wid Swenska Post-Tidningarna", no. 31–35 transcribed and commented by Kjell Lekeby, *Fri-Murare 1738* (Uppsala 1997). Unfortunately I had only full access to the French original and its Swedish translation.

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knowledge accumulated among craftsmen and architects was attractive for early Enlightenment savants to tap into. Far from being simple workmen, freemasons needed elaborate theoretical skills in order to construct edifices of ecclesiastical and profane architecture. This might explain why one of the earliest accounts of an initiation into freemasonry (1646) stems from Elias Ashmole (1617–1692)—a non-craftsman and founding member of the Royal Society.[2] The close relationship between scientific culture and freemasonry increased greatly in the early eighteenth century. Based on Margaret C. Jacobs's writings on the topic, Paul Elliot and Stephen Daniels have concluded that "Freemasonry was stimulated by Newtonian natural philosophy, and that in turn Freemasonry helped to shape Enlightenment scientific culture by promoting secular and progressive forms of civic culture".[3] Initiated by Newton's assistant, John Theophilus Desaguliers (1683–1744), an experimental scientist, inventor and fellow of the Royal Society, the fraternity of freemasons in 1723 published its (previously internally communicated) *Constitutions* and *Charges*, outlining the foundation myths and the organisational structure of freemasonry, which as such was a typical act of erudition of the period.[4] Here, the terms "art" and "sciences", often in the combinations "royal art" and "noble sciences", have a significant position and will receive further elaboration later. The perception of a relationship between freemasonry and educated culture was strong and manifested in various ways. An initial thorough presentation of a diorama displaying the workings of a masonic lodge will be presented as one of the most peculiar representations of this perception, with an attempt to outline how "arts" and "sciences" are represented in this remarkable piece of visual art and printing culture. Subsequently, briefly treating the membership of savants in Masonic lodges, the last part of the paper attempts to map a discourse on the relationship between freema-

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[2] An overview of the relationship between craft freemasonry and the phenomenon of accepted freemasonry is given by Matthew Scanlan, 'The Mystery of the Acception, 1630–1723: A Fatal Flaw', *Heredom* 11 (2003), 55–112.

[3] Paul Elliot and Stephen Daniels, 'The "School of True, Useful and Universal Science" Freemasonry, Natural Philosophy and Scientific Culture in Eighteenth-Century England', *British Journal for the History of Science* 39 (2006), 207–229: 209, and Jacobs' works referenced herein. The authors capitalised the term "freemasonry". Together with many other researchers in the area, I prefer to spell freemasonry with small letters, stressing that it is not one unified phenomenon or entity, but rather a dynamic concept of fraternal sociability with many variations.

[4] For practical reasons, I have used the online edition of the first American reprint carried out by Benjamin Franklin in Philadelphia in 1734 available on the URL: http://digitalcommons.unl.edu/ (accessed 22.09.2009). All subsequent page numbers refer to Franklin's reprint.

sonry and science as it appeared in two masonic journals in Vienna and London in the 1780s and 1790s.

A View into the Scientific Workings of a Masonic Lodge? Engelbrecht's Diorama

One of the major innovations of European print culture was the invention of printed miniature theatres, optical parlour toys, peep shows or dioramas. When consecutively mounted and arranged front to back within a display box, cut-out plates printed on cardboard (in the following named "wings") create a three-dimensional perspective scene. This concept, copied from theatre stage scenery, is both simple and revolutionary: it allowed the viewer a look into something, creating dimension through enhanced perception. Early masters of this printing technique were the brothers Martin (1684–1756) and Christian Engelbrecht (1672–1735), print-sellers and engravers in Augsburg.[5] Martin Engelbrecht had engraved a spectacular series of illustrations, ranging from contemporary European potentates to images of Rugendas and other classical masters, and his work has been characterised as being "beyond comparison".[6] His other works included illustrations for Ovid's Metamorphoses, The War of Spanish Succession, 92 views of Venice, and a series of prints of workers and their dresses. Engelbrecht's earliest dioramas are dated around 1730. His engraved cards inserted in a display box showed religious scenes and pictures of everyday life in perspective view, among these the Expulsion from Paradise, the Final judgement, the Festival of Tabernacles, scenes from a rural "Oktoberfest", a royal jousting, miners at work in an underground coalmine, and many others.[7] Optical prints such as Engelbrecht's dioramas were a form of elaborate and certainly expensive eighteenth-century entertainment, representative for early visual media and precursors of later forms of three-dimensional and cinematographic illusionism. In this context it is

[5] Janet S. Byrne, 'Ephemera and the Print Room', *Metropolitan Museum Journal* 24 (1989), 285–303: 295–296.

[6] Stephen Gertz, 'The Miniature Theaters of Martin Engelbrecht', published on 23 July 2009 on URL: http://www.bookpatrol.net/2009/07/miniature-theaters-of-martin.html (accessed 21.09.2009).

[7] A comprehensive overview of the works of Martin Engelbrecht is provided by Martin Bircher, '"Horribilicribrifax" illustriert: Engelbrecht und Bodenehr als Illustratoren von Andreas Gryphius' Lustspiel', in Norbert Honsza and Hans-Gert Roloff (eds.), *Daß eine Nation die ander verstehen möge: Festschrift für Marian Szyrocki zu seinem 60. Geburtstag* (Amsterdam 1988), 97–122: 98–99.

fascinating to find an Engelbrecht diorama, dated between 1730 and the middle of the century, displaying a scene from a lodge of freemasons (titled "Franc-maçons Freymaurer/Loge", engraved by Jeremias Wachsmuth, 1711–1777) and, more relevant for this volume, to find the activities of this masonic lodge intimately related to science.[8] The view into secret space of a freemason's lodge, where the members are by no means performing secret rituals but rather are occupied with scientific work, is extraordinary.[9] What is the link between secrecy and science, and the self-perception of savants in the eighteenth century? How did freemasonry imagine the concept of science? And how was freemasonry perceived as scientific?

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[8] As per September 2009, I had located following copies: Library and Museum of Freemasonry (London); Centre de Documentation Maçonnique (Brussels); Österreichisches Freimaurermuseum (Rosenau); Deutsches Freimaurermuseum (Bayreuth); CMC (The Hague); Museum of the Grand Loge National de France (Paris); the East Lancashire Provincial Museum in Manchester. I want to express my thanks to all the curators who provided me with information and images related to these dioramas. Another copy is held in a private collection in Italy. In the exhibition catalogue *The Freemason's Raiment of Light* (Tours 2002), 222 and 223, six cardboards of Engelbrecht's diorama are presented (dated here to 1760). Rüdiger Wolf (ed.) writes in the exhibition catalogue *Mozart: Experiment Aufklärung im Wien des ausgehenden 18. Jahrhunderts* (Wien 2006), 379, that the diorama "illustrates the role of sciences and arts in the lodges". For an image of the diorama exposed in 2006, see the exhibition catalogue *Österreichisches Freimaurer-Museum* (Wien 1994), 123. Erich Lindner in *Die königliche Kunst im Bild* (Graz 1976) reproduces as no. 122 a diorama from the collections of the Bibliotheque National in Paris, restored in 1943. A version of the diorama is presented online on the URL: www.glnf-musee.fr (accessed on 28.09.2009). The leading Austrian rare book dealer Inlibris in 2009 offered four of Engelbrecht's dioramas for sale, among them a copy of the masonic diorama, see URL: www.rarebooksandautographs.com/content/english/bestand/sachgebiet.php?sg=Arts%2C+Technology%2C+Manufactures (accessed 28.09.2009). Inlibris dated the diorama to as early as 1730 and suggests that this set was formerly part of the repertoire of a travelling showman. I have written twice to Inlibris, but unfortunately to date (as per November 2009) not received a reply to my request concerning the dating. I do not want to elaborate much further on this interesting question, but given that the start of freemasonry in the Old German Empire traditionally is said to have taken place with the formation of a lodge in Hamburg in 1737, it is unlikely or rather it would be speculation to say whether a diorama already had been printed seven years earlier. Furthermore, it contains imagery from a work published in 1736. The first German exposure of freemasonry, a work written in its defence, was published in 1738. I will subsequently demonstrate that significant parts of the idea of activities in masonic lodges might have been derived from this source. Martin Engelbrecht died in 1756. The most likely time span during which the diorama was designed and executed is 1736–1756.

[9] Within Scottish rite freemasonry in the US, there developed a strong tradition of theatre and stage plays and it could be argued that Engelbrecht's diorama is the very fist proof of "staging ritual space". See the exhibition catalogue C. Lance Brockman (ed.), *Theatre of the Fraternity: Staging the Ritual Space of the Scottish Rite of Freemasonry* 1896–1929 (Minneapolis 1996) with attached convolute of prints.

The foundation of masonic thought was laid down in the *Constitutions* and *Charges* of Freemasonry, edited by the Scottish priest James Anderson (1679–1739) in 1723 and published in a number of editions during the eighteenth century. Whereas the *Charges* regulate the organisational principles of masonic lodges, the *Constitutions* treat the ideology and mythical history of freemasonry with a clear component of Western hermetic tradition, linking its origins with the Creation, the erection of the Temple of Solomon, and other spectacular edifices throughout human history. Based upon the mythology of mediaeval guilds, it is, however, significant to note that the concepts of "science" and "art" within the *Constitutions*, denoting two distinct types of knowledge, frequently recur. Masonic lodges in Europe adopted not only the organisational form and ideology outlined in these fundamental texts, but shared a ritual practice, serving the purpose of initiating new members into the Craft and conferring higher degrees on them. The classical organisational division of guilds in various classes—apprentice, fellow and master—was transformed into an elaborated ritual degree system by the early 1720s, loaded with references to the symbolism of various religious and philosophic traditions and to apocryphal lore.

These rituals were performed in secret, private, non-public space. When a lodge met in a designated room for functions, often in a tavern, and the doors were closed, it met in a private, secret space—enhanced by ritual and interior design—differentiating it radically from public space. Rituals enacted for experience were intended to remain secret to the outside world as a form of performed knowledge shared by the brethren of a lodge and guarded by signs and tokens with which freemasons would identify each other as members or holders of a certain degree. Every candidate was obliged to individual secrecy by his oath not to tell anyone about what he had witnessed or experienced or anything about the rituals performed. This form of secret sociability of course created suspicion and curiosity among the public and the authorities alike. Wolfgang Hardtwig argues that it is possible to distinguish between "the secret" as the content of knowledge [Wissensinhalt] and metaphor on the one hand and "secret society" as a certain type of societal organisation on the other hand.[10] Freemasonry in all its varieties centred around these two concepts of secrecy with a symbolic and a concrete dimension of conspiracy, often

[10] Wolfgang Hardtwig, 'Eliteanspruch und Geheimnis in den Geheimgesellschaften des 18. Jahrhunderts', in Helmut Reinalter (ed.), *Aufklärung und Geheimgesellschaften* (München 1989), 63–86: 63.

overlapping in the eighteenth-century context. Speaking of the Order of Illuminati—and in the present author's view this applies to much of eighteenth-century freemasonry—Hardtwig writes:

> The secret as cipher for the potentiality of autonomy and self-education of the personality is present in the programmatic texts of the Order of Illuminati as much as the imagination of methodical, concealed, that is secret action with a political aim. Conversely, the Secret as cipher of the challenging Unknown in researching nature supposes the concrete separation of intellectual seekers from officially sanctioned institutions and forms of knowledge-acquisition.[11]

For the savant member of a masonic lodge, the concept of secrecy with other words underpinned a programmatic belief in the refining function of education as much as it offered an intellectually free space liberated from ideological control. Furthermore, secrecy could serve as a motivation for concealed action in public space.

However, the concept of secrecy did not lose its attraction by public exposure. One of the first examples of a disclosure was published in the *Post-Boy* in the very year of the publication of the *Constitutions*.[12] And there were more to come. In 1730 Samuel Pritchard's *Masonry Dissected* disclosed the secrets of masonic ritual in print. Perhaps *L'Ordre des Francmaçons trahi et les Secrets des Mopses revelée*, which was originally published in Amsterdam in 1745 and quickly spread both in translations and reprints all over the continent, became the most influential. Engraved plates provided the reader with images of the rituals performed and symbols used inside the lodge. A series of seven elaborated etchings was printed in the same year in Leipzig, based upon a slightly earlier French exposure: *Le Coutumes des Francs-Maçons dans leurs assemblees*.[13] There was in other words no lack of vivid descriptions and visual evidence of the activities of masonic lodges. Therefore, it is even more striking that

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[11] Ibid., 64–65. All translations by the author of this article. It is beyond the scope of this article to treat the historical Order of Illuminati (1776–1785). However, the membership of prominent eighteenth-century savants and a savant concept of its activities, ideologies and rituals are obvious. The Illuminati chose the owl of Minerva as their symbol. For a recent reference, see Reinhart Markner, '"Ihr Nahme war auch darauf": Friedrich Nicolai, Johann Joachim Christoph Bode und die Illuminaten', in Hans Erich Bödeker et al. (eds.), *Friedrich Nicolai und die Berliner Aufklärung* (Berlin 2008), 199–225. Markner has recently worked on a scientific edition of the correspondence of the Illuminati.

[12] Brent Morris, 'The Post Boy Sham Exposure of 1723', *Heredom* 7 (1998), 9–38.

[13] [Johann Martin Bernigeroth (ed.)], *Le Coutumes des Francs-Maçons dans leurs assemblees principalement pour la reception des apperentifs et des maitres, tout nouvellement et sincerement decouvertes* [title also in German] (Leipzig 1745). The etchings are designed by a "Marquise de ***" and engraved by a "Mademoiselle ****".

the view Engelbrecht created with his diorama elaborates upon a completely different perception of freemasonry. The quotation at the beginning of this paper is taken from a French apology of freemasonry, *Relation apologique et historique de la Societé des Franc-maçons* (1738) translated to German as *Gründliche Nachricht von den Frey-Maurern nebst beygefügter historischen Schutzschrift*, printed in 1738 and reprinted in a second edition two years later. It is likely that the image of freemasonry as communicated in this book inspired Engelbrecht, describing "a society where the core and essence of noble sciences and useful inventions is quested, handled and cultivated" and that freemasons "didn't practice anything else than noble exercises and free sciences, aiming at the usage of Reason and Intellect . . . the sound application of Reason and the progress of the Intellect in experiments and action." The senses, the anonymous author goes on, "were indulged by fair thoughts and considerations and discoveries in the realm of nature, as well as by findings and clear demonstrations of manifold phenomena."[14] And he continues:

> The aim of freemasons is such that their guild and society rightly can be named a true brotherhood and delightful *Society* or a Noble *Academy*, the members of which do not seek anything else than the edification of Reason . . . engaged in calm and ordered conversations, for the knowledge and instruction on the right and just usage and exploitation of Creation.[15]

The brethren depicted in the miniature theatre are not performing rituals such as were already exposed in other printed products, but are all engaged somehow in scientific activity. To the contrary of what almost all of the other exposures previously had related or depicted, Engelbrecht engraved freemasons measuring, reading, reflecting, discussing, explaining, looking for answers in books, on astrolabes and globes, and using mathematical instruments.

Layers of Perception: From Measurement to Transmutation

Research in the provenience and spread of these dioramas has so far shown that they were produced in at least two separate varieties; around ten are to be found in various collections across Europe.[16] These dioramas have different elements and are colourised in different manners, allowing

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[14] *Relation Apologique* 1738 (note 1), 24; Lekeby 1997 (note 1), 32, 36 and 38.

[15] Lekeby 1997 (note 1), 41.

[16] For reasons of consistency I will predominantly treat the Brussels version of the diorama and refer to other varieties if necessary. Images of the diorama and its separate parts

the conclusion that colouration was carried out locally.[17] To return to the motive: the description presented here takes the perspective of the observer, who looks into the diorama. What we see is not a secret society carrying out secret rituals, but rather a group of educated men, discussing scientific questions and tools, measuring the world and the universe guarded by female deities and male deities: Minerva (Pallas Athene) and Mercury (Hermes). Minerva is predominantly the goddess of wisdom, education and learning, arts and crafts, astrology and magic, and Mercury the messenger of the gods, the god of merchants and trade but also the father of the "hermetic"—the very term is derived from Hermes himself.

At the centre of the diorama, wing 5 depicts nine freemasons grouped around a U-shaped table chaired by a worshipful master carrying a sun amulet, seated on a throne embellished with masonic iconography (fig. 1). On the table we find masonic and mathematical instruments such as trowels, compasses, and rulers. In front of the master is a lectern with skull and bones, flanked by two candles. Behind the table is a chest, presumably to keep books, tools and documents. To the left is a tenth upright figure engaged in conversation with one of the seated lodge members. It appears as if he is delivering a message to the figures seated around the table, suggesting that these are nine masters who constitute a lodge. Somebody is reading what appears to be a letter or a leaflet and another is reading a book. Notes are taken, perhaps by a secretary. To the right of the master are two freemasons engaged in conversation and another has a convolute of documents or a book in front of him. At the top of the scenery we find a typical emblematic representation of tools used in various sciences such as could be found in any frontispiece of an encyclopaedia: square, compasses, rulers, levels, a document, a globe, an axe, a trowel. And to the left and right, in front of a column and each on a pedestal, we find Minerva and Mercury.

This description is almost a visual representation of passages in the previously mentioned *Gründliche Nachricht* (1738). The appearance of Minerva has already been referred to in the introductory quotation. It is

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have been made available by courtesy of CEDOM, Le Centre de Documentation Maçonnique in Brussels, Belgium.

[17] Since I became interested in this most remarkable piece of visual art, I am grateful for discussions with and remarks by many people in the research community who cannot be credited individually here. However, I would like to thank especially Andrea Kroon, who generously has placed parts of her yet unpublished PhD dissertation *Het schootsvel van de vrijmetselaar. Een kennismaking met een ritueel kledingstuk*, University of Leiden, 1996 and an unpublished paper with a description of the diorama at my disposal.

Fig. 1. Diorama displaying scientific workings of a Masonic lodge (c. 1750), Engelbrecht (Augsburg). With courtesy CEDOM, Brussels.

also vividly described how lodge members deliberate various topics. The possibility is almost ruled out that the lodge cannot reach a joint position "as it is manned with so savant and skilled men, being versatile in Sciences, that it is difficult to propose a topic they would be incapable to resolve." The Secretary and his duties, the President and the chest we can see in the Diorama are also mentioned. Annual transactions of the lodge, containing "resolved problems, intelligent questions and theses with their Pros and Cons in a variety of Sciences, Arts and noble Crafts" are to be kept locked up in the chest. This chest almost represents a bank of knowledge, as savants, artists and authors can request information from the lodge: "And hence the *Archives* of freemasons could be called wells unable to run dry, out of which can be extracted what brings Sciences and Free Arts to perfection and what otherwise is looked for in vain in other parts of the world."[18]

[18] *Relation Apologique* 1738 (note 1), 56, 59 and 61; *Gründliche Nachrichten* 1738 (note 1), 117–118; Lekeby 1997 (note 1), 46, 48 and 50.

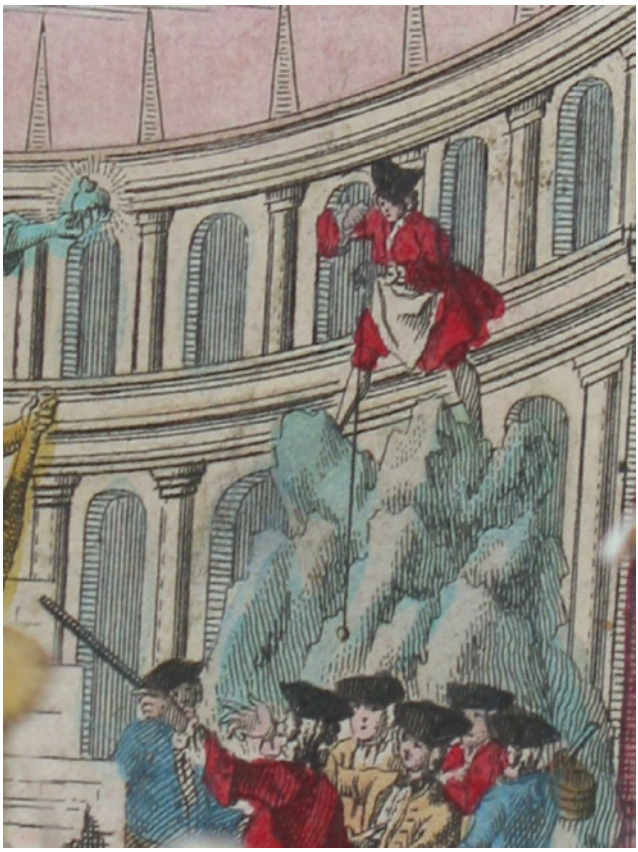

Fig. 1a. Detail.

In front of the table (wing 4) are two groups of freemasons dressed in masonic aprons, placed around two tables to the left- and right-hand side of the space. The group to the left is apparently discussing masonic tools that are placed on the table, one of them reading from a booklet. At the right-hand side three masons are engaged in conversation, whereas a fourth seated figure poses in deep thought, measuring a double circle with a ruler.

Wing 3 shows three different groups of masons. Four of them are seated on chairs placed to the left and to the right, shown from the back and ornamented with masonic symbols. To the right, two upright figures are engaged in conversation. In the middle of the scenery we see two freemasons measuring a terrestrial globe, continents, countries and seas, with compasses and square. One of the seated figures to the left is pointing

with a trowel in the direction of the globe and one of the upright figures to the right points with his square in the same direction. The two measuring masons appear to receive instructions from these figures.

The second wing displays two groups of freemasons, five altogether, placed to the left and right of an astrolabe. Two masons to the right hold masonic tools, a square and a trowel, and are engaged in conversation with each other. To the left a seated figure is reading a book, whereas an upright figure holds a levelling rule and a third figure is pointing towards the astrolabe. At the top of the wing we find an arch with a medallion displaying the title of the diorama: "Franc-Maçons/Freymaurer Loge".

These three wings represent educational imagery. Freemasons do not conceal anything from to each other, writes the author of *Gründliche Nachricht*, "even the youngest freemason gets access to all knowledge that is cared for by them, as much as the *Quinta Essentia* of Sciences and any other Noble Experience".[19]

The first wing serves as a frame for the entire scenery with two ionic columns holding a classical arch with no further motifs. One of the more significant differences between the various dioramas concerns this very first frame. Some of the versions show two crests to the left and the right of the arch and to the middle a medallion with a portrait of a man dressed in red. The left crest shows a yellow cross on a bluish (?) background; at the centre of the cross is a bird on top of a bell.

However it is the background of the diorama that diverges significantly between different versions of the diorama. In the Brussels version predominantly treated here, we find eleven freemasons displayed on wing 6. Two groups of freemasons are placed to the left and the right of a pyramid built up of seven steps and are obviously being informed and instructed or having a lively discussion. An individual freemason to the right of the pyramid is placed on a natural and rough rock and is measuring it with a plumb line. A two-storied classical arch, forming a sort of apse or gallery, with eighteen pyramid-shaped pinnacles, frames the scenery to the rear. On the third step of the pyramid, or in fact on top of an archway that forms the entrance to the pyramid or a vault, we find a statue of a smiling bear-bosomed strong, wild (and old?) man, leaning on a club in his left hand. The statue is colourised in earthy colours, ochre yellow or gold in one version, brownish in another. On the seventh step on the top of the pyramid there is a smiling female figure, colourised in

[19] Lekeby 1997 (note 1), 42.

sky blue/azure. She carries a sceptre with the moon (or a snake?) in her right hand, a burning radiating heart in her left hand, an amulet in the shape of a perfect double circle (with some resemblance to the one displayed on wing 4) as well as a sort of radiant diadem. In some versions of the diorama the last wing displays a burning furnace in an arch right behind the chair of the worshipful master. This arch is part of an apse behind which we find two staircases to the left and right, leading further upwards, to an invisible higher level of the building as well as two dark vaults, leading into the unknown.

For proper interpretation, the scenery can be divided into three different spaces: the foreground, the central part, and the events taking place in the background. In total, the diorama treated here pictures 41 freemasons distributed across five different levels. The twenty freemasons towards the front of the diorama (wings 2, 3 and 4) are studying masonic tools and are instructed in the basic artistic skills of measurement. The educational character of the scenery is stressed by wing 3, where officers of the lodge, seated in designated chairs, are instructing their brethren measuring the globe. The next level (wing 4) suggests that a capacity has been acquired for independent resolutions of (mathematical) problems. The centrepiece of the diorama (wing 5) is where noble science is studied at the level of initiated and competent mastery, nine masters constituting the basis for a lodge. The gentlemen placed around the central table manage the full range of scientific knowledge needed, between Minerva (theory) and Mercury (application). The very last wing, with its intricate scenery, suggests that there is more to the royal art. We are entering a completely different scene. Although some form of instruction and education also takes place, the pyramid transports the strongest message. The male, earthbound figure on the pyramid is most probably to be identified with Hercules, or strength; on the highest step a female figure may represent a goddess, muse or priestess (Vesta?), probably wisdom, Sapientia, in conjunction with religious exaltation. Hence it is not difficult to relate the scenery to the masonic triad of concepts, "wisdom-strength-beauty". The sky-blue female figure clearly is spiritual, placed above nature and natural force. The steps leading from the one figure to the other suggest that what the ten freemasons are instructed in is a transformation process in a polarity from the lower to the higher powers in man, and it is not difficult to read into this that the pyramid could refer to minor and major alchemical working. If we add that in some of the versions of the diorama a burning furnace (as in use in alchemical working) is displayed, it is no exaggeration to suggest the interpretation that deeper involvement in masonic science embraces the art of transmutation from disorder to perfection.

It is surprising to find references to alchemy and the art of transmutation in the diorama, as they usually did not enter the imaginative world of freemasonry before 1750. However, *Gründliche Nachrichten* tells us that "both *Chemists* and *Alchemists* receive diligent elucidation and information concerning requests about problems they have encountered in whatever *operation* and *laboratory* work they are engaged in". Some of the alchemists, it is claimed, were untroubled by huge expenditures thanks only to the prudent advice they had received from freemasons concerning the art of making gold and the quest for the Philosopher's Stone.[20]

So what about the number 41? There is a very odd figure displayed on the very last wing—an individual freemason on a brute rock, measuring with a plumb line. The symbolism of working on a brute stone in order to smooth a perfect ashlar is a prevalent if not constitutive figure of thought in freemasonry. Within the perspective of the diorama, this single individual stands out, not only above all others—almost on the same level as the goddess—but also for its engagement in intercourse with nature itself. Maybe freemason 41 represents the ultimate goal of the savant learning process. He has been refined through education in the sciences, he has been taught the royal art of transformation and he—as an individual—is now enabled to master nature and his own desires autonomously in order to create perfection.

Gründliche Nachrichten summarises the essence of masonic science as it is represented in the diorama, investigating the three realms of nature and the universe:

> In such a state [the freemasons] seem to be able to send their thoughts and attention into the universe and diligently observe all its blazing bodies and wonders in every sphere, course and movement. On the other hand, their contemplations stretch down to the harbour and interior of the Earth or almost to its centre, to investigate the product of the underworld and the reproduction of liquid and transparent as well as solid and dark growing structures, mineral bodies and precious gems, their real constitution. From there, or from such sheers they again lift their thoughts up to the Earth, in order to investigate the shape and inherent utility of trees, crops and all sorts of herbs as much as living bodies, composition, strength etc. These diligent freemasons also meditate carefully and investigate the changing motion of weather and the movements of Oceans and the wild sea within its limitations.[21]

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[20] *Relation Apologique* 1738 (note 1), 63; Lekeby 1997 (note 1), 52.

[21] *Relation Apologique* 1738 (note 1), 47–49; *Gründliche Nachrichten* 1738 (note 1), 111–112; Lekeby 1997 (note 1), 42–43.

Does the imagery of the diorama and what we learn from *Gründliche Nachrichten* refer to what Elizabeth L. Eisenstein has branded "a special 'Minerval' branch of masonry"? She claims: "The figure of Minerva, often in conjunction with Mercury and other special symbols [such as displayed on wing 5 of the diorama], occurs frequently in frontispieces of works favoured by freethinkers of a certain kind."[22] In outlining features of print culture, she analysed the links between secret space and the activities of early eighteenth-century publishers and engravers like Bernard Picart, a member of the fraternal order Knights of Jubilation.[23] Moreover, Picart in his work *Cérémonies et Coutumes Religieuses de tous les Peuples du Monde* (vol. 4, Amsterdam 1736) included an engraved list of lodges in front of which we find a table in the form of a square, surrounded by freemasons. His image was modelled on a famous engraving done by Pine in 1735.[24] In fact, Picart's engraving has some striking similarities to Engelbrecht's diorama. Not only are the eleven freemasons in Picart's version dressed in the same fashion; they are also carrying masonic tools such as compasses, trowel and square and, moreover, they are engaged in reading and conversation. Wing 2 of Engelbrecht's diorama displays (although reversed) a seated and upright freemason, almost identical to one in Picart's engraving, who is pointing at the astrolabe in the same fashion as the central figure in Picart. The chair of the Worshipful master is decorated identically in the two images with moon, terrestrial globe, sun and masonic symbols, a similarity that also applies to the officers' chairs on wing 3. The chest displayed behind the table and the pair of candleholders on the table (wing 5) are also to be found in Picart. A closer look at wing 1 of some of the versions described above reveals, not unsurprisingly, the imagery that is also to be found in Picart's engraving. The gentleman dressed in red on the central medallion has a look and a pose identical to the portrait of Sir

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[22] Elizabeth L. Eisenstein, *The Printing Press as an Agent of Change* (Cambridge 1979), 143.

[23] Margaret C. Jacob has devoted significant parts of her research on freemasonry to this subject, interpreting the early Dutch printing trade and its links to fraternal orders like the Knights of Jubilation as precursors of Newtonian freemasonry in Britain. See also the digital resource on Picart at UCLA, URL: http://digital2.library.ucla.edu/projects_collaborations/Picart.shtml# (accessed 15.11.2009).

[24] I have consulted the reprint reproduced in *Acta Quatuor Coronatorum* 23 (1910), inserted as fig. C. between 126 and 127. This is a reversed print that apparently also served as the model for Engelbrecht, when the position of the figures is considered. See also *Acta Quatuor Coronatorum* 5 (1892), 57f. and B. Croiset van Uchelen, 'Les Free-Massons', *Thoth* 12 (1961), 85–94. The UCLA digital version is available on a test site under URL: http://zoe.ats.ucla.edu/Picart/ (accessed 14.11.2009).

Richard Steele (1672–1729), an Irish writer and politician, founder of the periodical *Tatler*, and co-founder of *The Spectator*, followed by the *Guardian*. Steele was also involved in London's theatre life.[25] The crest to the left is more difficult to explain, however lodge number 88 represented on the engraved list of lodges displays a bird on a bell, a lodge (established in 1732 and disbanded in 1754) that met at the Bell and Raven Inn in Wolverhampton. Furthermore, the crest to the right closely resembles the coat of arms of Oxford University, listed as University Lodge number 74, together with the coat of arms of Cambridge University. Unfortunately, it cannot be established whether the crest of one of Europe's oldest universities and a Staffordshire signboard were chosen by random or on purpose.[26] The obvious similarities between the two images do, however, suggest that Wachsmuth/Engelbrecht were familiar with Picart's imagery and used it as one their sources of inspiration.[27]

A Truthful Representation of Masonic Science?

Does Engelbrecht's diorama represent a correct image of the kind of activities performed in a masonic lodge? What spectators of this scenery are told is that freemasons read, discuss, measure, experiment, reflect, that they communicate their knowledge, that there is a tangible relationship between freemasonry and scientific culture, that freemasons are savants and hence what happens in presumed secrecy is in reality a secret for the savant. This science is carried out with tools to be found in a masonic lodge, in between Minerva and Mercury, science of the past, and applied sciences situated in a temple surrounded by nature. Some versions of the diorama suggest furthermore that freemasonry not only leads from speculation to application but also from ruin to perfection. Everybody versed in eighteenth-century masonic ritual immediately recognises that the scenery the diorama displays has little to do with the majority of activities in a masonic lodge. It is, however, of minor interest whether what is

[25] See Rae Blanchard's article, 'Was Sir Richard Steele a Freemason?', *Publications of the Modern Language Association* 63 (1948), 903–917 that also elaborates in considerable detail on Picart's print.

[26] I am indebted to Martin Cherry at the Library and Museum of Freemasonry in London for his invaluable help in decoding the imagery of the crests.

[27] It is worth exploring further whether Engelbrecht used Picart as a source of inspiration for his other dioramas with religious imagery. For example, Jonathan Schorsch in his *Jews and Blacks in the Early Modern World* (Cambridge 2004), 170 and 258 includes images of Picart and Wachsmuth/Engelbrecht.

represented in this diorama is a true or false representation; of real interest is the image of freemasonry the publishers of the diorama intended to spread. Freemasonry was perceived as a secret society; it rituals had been exposed several times and the papal condemnations of 1738 and 1751 were known to the European elites. The purpose of the diorama was not to divulge secret rituals, but rather to communicate a self-image, a representation of the "noble science of freemasonry" and freemasonry as a scientific approach towards the creation of new knowledge.

Savants in the Lodges

The evident links between organised freemasonry in Europe and the republic of letters could be studied systematically once membership records became available for research on a larger scale. There are, for instance, significant overlaps between members of the Royal Society and the founding generation of English freemasonry, but this fact also applies for the rest of Europe.[28] Freemasonry in England not only promoted Newtonian science, but also Enlightenment antiquarianism. And the value of science was more important than its content, a recent study argues.[29] In 1741 a lodge called *Minerva zu den drei Palmen* was founded in Leipzig, gathering important academics and savants. One of them was the Huguenot Jacques de Pérard (1712–1758/1766) who moved to Stettin, a provincial town at the Baltic coast of Prussia. De Pérard was a member of a number of educated societies such as the Royal Swedish Academy of Sciences in Uppsala, the Imperial Academy of Sciences in St. Petersburg, the Royal French Academy of Sciences, the Royal German Societies of Greifswald, Göttingen, Königsberg and Jena. He edited the journal *Nouvelle Bibliothèque Germanique*. Within freemasonry, he acted as Worshipful master of the lodge *Zu den Drei Zirkeln* [Three Compasses].[30]

The lodge emblem displays three circles in an equilateral triangle, placed on a shield (fig. 2). Towards the top are symbols referring to the fine arts—a palette and paint brushes. Towards the bottom we find musical and mathematical instruments, a torso, a laureate, a book and a

[28] Joseph R. Clarke, 'The Royal Society and Early Grand Lodge Freemasonry', *Acta Quatuor Coronatorum* 80 (1967), 110–119 with a list of freemasons that also were fellows of the Royal Society (in total one in four of the F.R.S. during the first half of the century).

[29] Elliot and Daniels 2006 (note 3), 219.

[30] Andreas Önnerfors, *Svenska Pommern: kulturmöten och identifikation 1720–1815* (Lund 2003), 131–133 and 189.

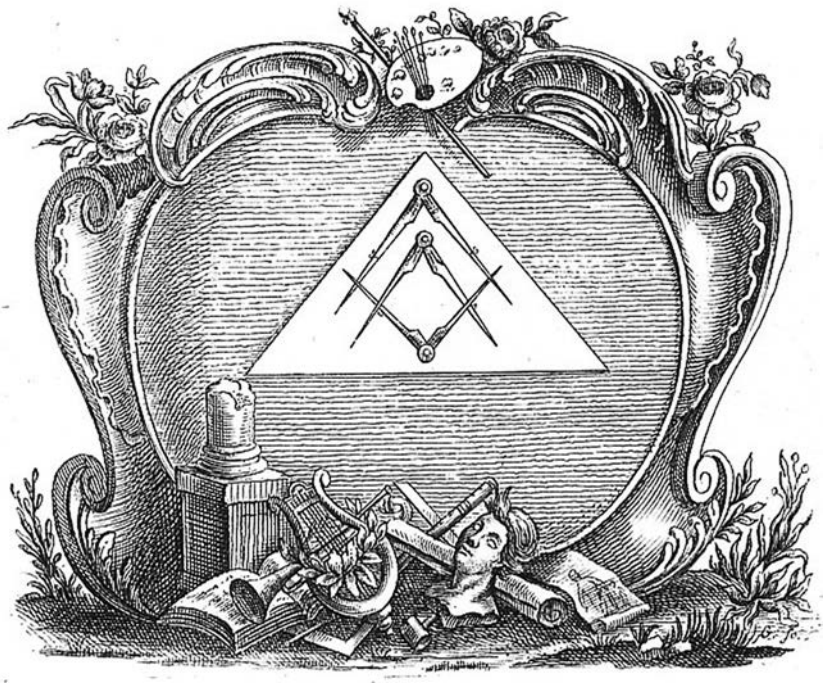

Fig. 2. Emblem of the lodge Zu den drei Zirkeln (Three Compasses) in Stettin (1762 f.), author's copy.

broken column. Masonic, scientific and artistic symbols are joined here in a fashion representative of hundreds of similar emblematic representations across Europe at the time. Brethren of the lodge in Stettin raised funds for a library and a collection of natural objects. Most important was the overlap between freemasonry and the local branch of the *Bund der Aletophilen* [Truth-lovers], a society established in 1736 under the motto of "Sapere Aude" with the aim of spreading the philosophy of Leibniz and Wolff. In 1766 the Aletophiles in Stettin donated their instruments and books to the masonic lodge. A year later freemasons received lectures in natural philosophy and were encouraged to present weekly lectures to which friends were invited.[31] If such a crossover between science and freemasonry can be observed at the outskirts of enlightenment Europe at the time, it is not surprising to find even stronger links in its hotbeds.

[31] Adolf Georg Carl Lincke, *Geschichte der St. Johannis-Loge zu den drei Zirkeln früher la parfaite* (Stettin 1862), 8–9.

Scientific lectures were delivered in London lodges already during the 1720s and 1730s on topics such as geometry, anatomy or chemistry.[32] Members of the lodge *Neuf Soers* in Paris were French Enlightenment figures such as the encyclopaedist D'Alambert, Lalande, and later also Benjamin Franklin.[33] Every new member had to deliver an oration and the regulations of the lodge stated that its purpose was to encourage the cultivation of sciences and arts. Voltaire's initiation in 1778 became a European media topic. *Journal für Freymaurer*, a publication that will be referred to below, quoted the French philosopher: "He thought that the desire of one of the most famous men in France could not be anything else than flattering for a society that, according to its inner state, combines science with freemasonry".[34] Readers were also informed that Voltaire received the "apron of glorious brother Helvétius, which the widow of this famous philosopher together with other masonic jewels had handed over to lodge of the nine sisters". Several hundred members of the European intelligentsia belonged to the Inner Order of the masonic system *Strict Observance* (1754–1782).[35] Just extracting the names of those who have their profession listed as professor provides us with around thirty names. Some of these are clearly academic professionals: Eck in Leipzig, Dähnert in Greifswald or Schwarz in Moscow represent a type of savant who not only is rooted firmly in academic hierarchies but who, through the editing of critical journals or membership in academies and educated societies, also represent new forms of knowledge production and dissemination. When applying a broad definition of the figure of "the Savant" in the eighteenth century we ought to count lawyers, physicians, booksellers, publishers and clergymen as an elite that perceived itself as "scientific". A systematic prosopographic exploitation of membership records of local lodges as well as educated clusters, such as has been carried out for the area of "Central Germany", must be carried out for other cultural hotbeds in Europe.[36] In addition to a

[32] Elliot and Daniels 2006 (note 3), 215–216.

[33] C.N. Batham, 'A famous French lodge', *Acta Quatuor Coronatorum* 86 (1973), 312–317. From this article we learn that Lalande had established a Lodge of the Sciences, confined to masons concerned with scientific research.

[34] *Journal für Freymaurer* 2 (1784), 231–242: "Voltaire's Aufnahme in den Freymaurerorden".

[35] *Verzeichnis sämmtlicher innern Ordensbrüder der Strikten Observanz* (Oldenburg 1846).

[36] Holger Zaunstöck, *Sozietätslandschaft und Mitgliederstrukturen. Die mitteldeutschen Aufklärungsgesellschaften im 18. Jahrhundert* (Tübingen 1999). The geographical term "mitteldeutsch" applied in this study is not uncontroversial as it implies a concept of Germany that stretches east of its borders with Poland, determined contractually by international

quantitative approach, we are in need of qualitative descriptions of the life histories of members. A clear analysis of the overlap between intellectual and masonic culture in Europe can only be achieved by a systematic approach using collective biography, including comparison between membership in secret societies and subscriptions to educated periodicals and editions or other projects of educated enlightenment.

"Scientific Freemasonry": The Relationship between Masonry and Science

Ignaz von Born (1742–1791), as master of the lodge of intellectuals *Zur Wahren Eintracht* [True Concord], in Vienna and editor of its *Journal für Freymaurer* (12 volumes, 1784–1786) can be regarded as the prototype of an educated Enlightenment figure and at the same time a devoted freemason.[37] Von Born united a career as a mineralogist, scientific author, and a member in academies (such as the Royal Society) and educated societies. The *Journal für Freymaurer* represents a new type of specialised masonic journal. It reinforces the medial image of freemasonry as scientific. Von Born strived to promote intellectual reflection and scientific method in outlining the nature of freemasonry. He also encouraged his fellow brethren to present the fruits of their intellectual reflections in the form of orations and lectures in specially designed "Lodges of Exercise" [Übungslogen]. Each of these volumes was introduced by an essay treating religious traditions and fraternities, ranging from the Magi to early Christianity, and hence puts the journal in the tradition of early comparative religious studies, such as already represented by Picart five decades earlier. Masonic orations on topics like "On the effects of masonry on the bravery and activities of the philanthropist" touched almost upon political ethics in a time when social reforms were still a distant utopia.[38] Some of the masonic news inserted clearly represents an overlap between scientific and savant space. Every year the journal reviewed masonic publications, an ambition that links it to the tradition of critical journalism of the time. One article reported the

law. It is, however, frequently used as synonymous with the hotbed of enlightenment within the area of Jena, Halle, Weimar and Leipzig.

[37] Helmut Reinalter (ed.), *Die Aufklärung in Österreich. Ignaz von Born und seine Zeit* (Frankfurt/M. 1991) serves as an excellent introduction to the personality of Born and his interest in secret and savant spaces.

[38] *Journal für Freymaurer* 4 (1785), 59–76: "Von den Wirkungen der Maurerey auf den Muth und die Thätigkeit des Menschenfreundes".

inauguration of a lodge in Edinburgh, working in Latin, "for the benefit of the students of Edinburgh University".[39] Two Vienna lodges in 1786 advertised the establishment of a "Scientific Institution" for the benefit of fellow freemasons. They had made it their principle rule, the article stated, to be of use for erudition in order to promote each individual freemason's capacity. Subsequently, a design for a scientific museum was presented, ranging from physical instruments and objects of natural history to artefacts from industry and trade. Furthermore, it was envisaged to acquire "the best classical authors from all nations" as well as political newspapers and journals for an attached library. The museum, with ambitious opening hours from 8 am to 9 pm, was intended for use for lectures of public utility. The most select instruments for natural sciences, relating to electricity and air, were already available. A subsequent demand to promote scientific experiments for the benefit of society was introduced with the statement: "Each freemason, who has moved closer to the sanctuary across the staircase of the temple, knows how much the doctrine of the Order makes preoccupation with sciences and arts a duty."[40] Already seven volumes earlier the programmatic forty-page oration "On the Links between Arts and Sciences with Freemasonry" was inserted.[41] The author of the article, a brother M**r (most likely Professor Joseph Märter, 1753–1827, who was a medic, botanist and geologist who had recently returned from a scientific voyage to America), initially quoted Plato, in a passage referring to the question of the purity of artwork in relation to the degree of science contained in it: Numbers, dimensions and weights are constitutive for any art: without them, very little would remain; and one of the most elaborate arts is architecture. The article argues further that the second degree of freemasonry tells the apprentice "that only a man educated by arts and sciences is able to claim the title of a fellow brother". He then in several pages goes on to describe the usefulness of studies within freemasonry and what the training of Pythagoreans might have looked like. However, opposed to the secret teachings of antiquity, the author stresses that sciences are to be used for the best of society:

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[39] *Journal für Freymaurer* 6 (1785), 248–249.

[40] *Journal für Freymaurer* 9 (1786), 203–215: "Wissenschaftliche Institute der beyden sehr ehrw. Logen zur neugekrönten Hoffnung und zur Wahrheit" [Scientific Institutions of the two very respectable lodges "To the new-crowned Hope" and "Truth"].

[41] *Journal für Freymaurer* 2 (1784), 65–104: "Ueber die Verbindung der Künste und Wissenschaften mit der Freymaurerey".

> Freemasonry has put the name of that science into the burning star that was the favourite object of study of the Pythagoreans, that Plato made a precondition for the acceptance into his school, and with which he believed even the supreme architect was constantly occupied, upon which the Enlighteners of human reason always and predominantly have based their reformation—and exactly that science is the first relevant precondition in order to obtain the higher degrees of freemasonry. What has the dark mind to do in the East? For what is the rule always to act according to designs, always to have in mind self-improvement and to work on the great temple of morality . . .?

Politics and morality, history, astronomy, observation of nature and natural sciences "that to the largest extent have contributed to the extinction of prejudices and to drive away superstition, that makes man the master of elements" and finally also poetry and beautiful arts that protect the educated from misogyny and hence inspire to the perception of the true, beauty and good: according to Märter all these sciences and arts are connected to freemasonry in the most intimate way. Volume VII contains a lengthy article on "Scientific freemasonry".[42] The author argued that freemasonry was imbued by scientific method, linking it to savant practices of the most distant ages. He claimed that knowledge had survived, protected by secrecy and communicated through the symbols of freemasonry. The author almost depicted an evolutionary prospect of the creation and destruction of knowledge by nature, time, warfare and migration: "A single disastrous day, such as the fire at the Ptolemaic library in Alexandria, dispossessed us of what had been gathered throughout centuries." Subsequently, he surveyed the history of erudition since antiquity and established that freemasonry aimed to transform secretly communicated knowledge to "higher moral education". Freedom, Equality and Charity, spread of Enlightenment, upheaval of differences in religion, nation and class were the goal of this refined education. Two volumes later, a short oration for the second, related degree on the preoccupation with sciences within masonry was inserted. It repeated in principle Märter's positions. Philosophy among people who refuse reason, natural science among those who "want to have it all supernatural", poetry in caves where emotions are banned, rhetoric where "silence" is written on the walls, medicine where the body is destroyed makes no sense. Freemasonry, however, is a natural harbour of science. Wisdom without scientific knowledge has

[42] *Journal für Freymaurer* 7 (1785), 49–78: "Ueber die wissenschaftliche Maurerey".

to be rejected. Again, the important position of geometry is stressed, "a science that strictly speaking is the only one". "Enlightenment, instruction of reason through sciences, ennoblement of the heart and morality through fine arts" are the preconditions of real charity and the augmentation of human felicity. A part of the talk formulates well the ambitions of Born's lodge and its journal: "Let us therefore collect our knowledge, explorations that we have made both within sciences and arts through reading and experience, like bees together in a joint place, to refine it into something suitable for all, and hence to add the general potential of human knowledge".

A decade later the *Freemasons' Magazine* was established in London, appearing as a monthly journal between 1793 and 1798. In an address to readers, the publishers stated that the Order of freemasons "justly boasts the possession of the most learned Men of all Countries".[43] An article outlining the goal of freemasonry stressed that freemasonry promoted and facilitated the acquisition of science and philosophy.[44] In an ode to freemasonry, the goddess Urania descends from the skies, "And Science attunes her sweet notes as she sings".[45] The jewels of the London lodge of *Nine Sisters*, as with its Parisian counterpart gathering predominantly educated men, were reproduced in elaborate engravings. Another article states: "A gentleman without some knowledge of arts and sciences is like a fine shell of a house without suitable finishing or furniture".[46] A longer article such as "On the study of natural philosophy" discusses Locke, Descartes and Newton and their concepts of knowledge and perception.[47] The notion that freemasonry is intimately linked to art and science and that these contribute to the refinement and civilisation of man is so widespread in the eleven volumes of the journal that it is impossible to list all references.

It is hence also not surprising that the journal in 1797 changed its title to *Scientific Magazine and Freemasons' Repository*. The change was motivated by the need to attract a wider audience and the proprietor promised in his address "to give Essays and Engravings illustrative of 'the Sciences'".[48] In the next volume it was added that there were plans to present a "com-

[43] *Freemasons' Magazine* 1 (1793), [III].
[44] Ibid., 138.
[45] Ibid., 167.
[46] *Freemasons' Magazine* 2 (1794), 413.
[47] Ibid., 369–374.
[48] *Scientific Magazine* 8 (1797), [III].

plete Repertory of Arts, Sciences and Manufactures", reporting on scientific inventions and discoveries as well as yearly or half-yearly overviews of the history of sciences "illustrated with plans and suitable engravings".[49] Under the heading "History of the Sciences for 1797" we find an account of an observation of a comet, among others by Caroline Herschell.[50] But an article on "The Existence of Mermaids" was also inserted. The programmatic statement that the current times were "consecrated to the Sciences" introduced "Anecdotes respecting the life and discoveries of Pythagoras".[51]

The following quote from a masonic oration inserted in the London magazine is representative of the self-image of British freemasonry and its relationship to arts and sciences:

> Though [freemasonry] derives its name from scientific, and its badges from operative architecture, it comprehends, the whole circle of arts and sciences; has been the depot of learning in all former ages, and a focus combining every ray of genius in all climes of the earth. A Lodge is in foreign countries eminently st[y]led [as] an Academy, and MASONRY considered as synonymous to GEOMETRY, the science relating to the measurement of the earth, and emphatically referring to its creation; a liberal or [freed?]; MASON signifying a friend and admirer, or a professor of liberal science, in contradistinction to an operative Mason.[52]

Science and Secrets as Parts of Savant Self-Design

A close look at the workings of masonic lodges of the eighteenth century allows the conclusion that identification with science and savant culture was of primary significance for the self-image of European freemasonry. Its iconography has many resemblances to visual commonplaces representing science on frontispieces, vignettes, epitaphs, or in artwork. Normative texts of freemasonry frequently mention "royal art" or "the noble science" of masonry, and their constitutive significance for moral self-improvement, civilisation and refinement of manners. It is also a matter of fact that eighteenth-century savants contributed to the compilation of these fundamental texts or provided historical legwork for them as well as

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[49] *Scientific Magazine* 9 (1797), [IV].

[50] Ibid., 150–154 and 305–306.

[51] *Scientific Magazine* 8 (1797), 103–106, as a response to an article with the same title in the *Freemasons' Magazine* 1 (1793), 388 and 381–385 (on Pythagoras).

[52] *Freemasons' Magazine* 6 (1796), 79–80.

elaborate commentaries on the ideology and symbolism of freemasonry. The overlap between the republic of letters and freemasonry becomes apparent through analysis of masonic membership in university towns or in other intellectual hotbeds. Some networks within the educated world received a further dimension through (underground) contacts in the realm of secrecy. Secret space provided the possibility of encounters and contacts and a free exchange of ideas. The emergence of a masonic periodical press at the end of the century illustrates the intimate link between savant and secret self-perception. Journals treating internal masonic topics were the utmost consequence of secrecy now entering the public discourse, characterised by critical analysis and open deliberation. Elliot and Daniels conclude: "The popularity of Freemasonry throughout Enlightenment Europe and in the colonies, especially in America, enabled it to play a significant role in the savant community, forming a distinct republic of letters, with brothers sharing rhetoric, organization and imagery."[53]

How is it possible to explain this tight aggregation? Why was membership in a secret society attractive for an eighteenth-century savant?

First of all, freemasonry filled an important function of eighteenth-century educated sociability in general. A lodge, "eminently styled as an Academy" (as quoted above), shared many organisational features of educated societies with those of freemasonry such as elected officers, summons to meetings or the function of a secretary in correspondence with regional and supra-regional actors. Lodges could also serve, as examples from Paris, Stettin or Vienna demonstrate, as forums where oratory skills were exercised. Secondly, the lodge created an intellectual free space that perfectly fit the savant of the eighteenth century. A communicative space was provided, liberated from governmental and ideological control. Behind closed doors it was possible to engage in a symbolic spiritual, performative happening. The complex composition and expression of ritual created a need for interpretation, requiring elaborate philosophical, religious or historical skills. Both as curious spectator and participant, the savant was challenged and stimulated to enlarge his knowledge within the field of ritual secret, symbolism, the history of the fraternity, or its moral and ideological implications for personal or public ethics (in extension this means politics). Furthermore, science in the eighteenth century was still on the verge of utopia. The secret created an important margin for the savant to engage with complex speculation without restrictions

[53] Elliot and Daniels 2006 (note 3), 227.

by the demands of the Enlightenment for rational empiricism and utility. The values reinforced within masonic ritual constantly stressed the need for extroverted charity with the abstract goal of augmentation of general human and social felicity and happiness. Eighteenth century man perceived that science was the vehicle for attaining the improvement of mankind. Freemasonry reassured and legitimised the ethical purpose of science and thus encouraged the secret savant to public action.

CHARACTER MASKS OF SCHOLARSHIP: SELF-REPRESENTATION AND SELF-EXPERIMENT AS PRACTICES OF KNOWLEDGE AROUND 1770

Hole Rößler*

> The characters with which one masks oneself
> Are more distinct than natural character
> —Denis Diderot[1]

In his lecture entitled "Von den Charakteren in der Geschichte" [On Characters in History] at the Institute of History at the University of Göttingen, Georg Christoph Lichtenberg (1742–1799) observed in 1765 that "demands are now being heard for every book to contain a representation of the physical features of its author."[2] Lichtenberg's statement was doubtless the result of his own reading experience, where he could not have failed to notice the considerable increase in author portraits on the frontispieces of books at the time.[3] Author portraits were, however, nothing new in the second half of the eighteenth century. A tradition of *viri illustres* literature, stretching back to early Renaissance humanism, had been providing interested readers with information about the external appearance of famous scholars in the form of descriptions and representations in illustrated biographies and *theatra eruditorum* ever since the late fifteenth century.[4] In addition, it had become increasingly common since the seventeenth century to include a portrait of the author at the front of books, often of voluminous works; pictorial representation as an addition to the author's

* I wish to thank Vera Koppenleitner and Gerald Reuther for their critical comments and helpful suggestions.

[1] "Les caracters d'emprunt sont plus tranchés que les caractères naturels." Denis Diderot, 'Réfutation suivie de l'ouvrage d'Helvétius intitulé *L'Homme*', in Jules Assézat (ed.), *Œuvres complètes de Diderot* (Paris 1875), 20 vols., II: 263–456: 283.

[2] Georg Christoph Lichtenberg, 'Von den Charakteren in der Geschichte', in id., *Schriften und Briefe*, ed. by Wolfgang Promies (Frankfurt/M. 1994), 6 vols., III: 497–501: 498.

[3] Roland Kanz, *Dichter und Denker im Porträt. Spurengänge zur deutschen Porträtkultur des 18. Jahrhunderts* (München 1993), 56–58.

[4] Claudia Valter, 'Gelehrte Gesellschaft: Wissenschaftler und Erfinder im Porträt', in Hans Holländer (ed.), *Erkenntnis, Erfindung, Konstruktion. Studien zur Bildgeschichte von Naturwissenschaft und Technik vom 16. bis zum 19. Jahrhundert* (Berlin 2000), 833–859: 846; Kanz 1993 (note 3), 46–56.

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name was meant to reinforce his authority.[5] These representations, however, were frequently loaded with allegoric and emblematic meaning through attributes and inscriptions. The author portraits whose existence Lichtenberg saw as the result of a new and general need among his contemporaries differed clearly from earlier representations in how they were meant to be interpreted and, accordingly, in the information they contained. What the reader could hope to obtain from a printed, graphic visualisation of the author's physique was no longer only a representation of outstanding scholarship predominantly by means of topoi but information about the author's individual frame of mind. In the year of Lichtenberg's lecture, the Swiss philosopher Johann Georg Sulzer (1720–1779) described the basic capacity of a portrait to make emotional disposition visible as one of its essential features: "Above all, there is nothing compelling, dignified, grand or exalted in the disposition and the character of a thinking being that cannot be made visible in facial features. The same is true for the opposite qualities. Everything in attitude and in character that is contemptible, spiteful, or detestable is expressed in the face and in physical comportment."[6] From this perspective, the pictorial "representation of the physical features" of a scholar offered the possibility to learn something about his character. Revealing in this respect is an episode from Adrien Baillet's biography of René Descartes (1596–1650), published in 1691. According to Baillet, Descartes's "mental disposition" [disposition d'esprit] was expressed in a portrait; Descartes, however, first attempted to prevent its publication and insisted at least on eradication of the date of his birth noted on it, as he "had an aversion to casters of horoscopes, whose errors one seemed to encourage when publishing a person's date of birth."[7] The—at least latent—preference for pictures as a medium to convey a person's invisible qualities, as opposed to birth dates, implies a transition from astrological to physiognomic paradigms. These were to

[5] Susanne Skowronek, *Autorenbilder. Wort und Bild in den Porträtkupferstichen von Dichtern und Schriftstellern des Barock* (Würzburg 2000), 15.

[6] Johann Georg Sulzer, 'Von der Kraft (Energie) in den Werken der schönen Künste', in *Vermischte philosophische Schriften. Aus den Tagebüchern der Akademie der Wissenschaften zu Berlin gesammelt* (Leipzig 1800), 2 vols., I: 124–147: 140. See also Kanz 1993 (note 3), 99–105.

[7] "*parce*, dit-il, *qu'il avoit aversion pour les faiseurs d'horoscope, à l'erreur desquels on semble contribuer quand on publie le jour de la naissance de quelqu'un*." Adrien Baillet, *La vie de Monsieur Des-Cartes* (Paris 1691), 2 vols., I: 8.

determine anthropological knowledge particularly in the second half of the eighteenth century.[8]

In this sense, a portrait of the author promised information that the text itself could not offer, but which was apparently seen as important for reading the text: a direct and incorruptible insight into the author's character, which, in turn, would allow an assessment of his moral and intellectual integrity. An author's portrait thus had the function of a paratext that was partly intended to guide the reception of the actual text.[9] Lichtenberg's additional astute and tart observation that the author, contrary to popular opinion, "frequently had less to do with his book than Cesar had to do with the current constitution of the German Empire,"[10] signified the importance that a wide readership assigned to the person of the author for assessing the quality of his work, as well as the expectations that were correspondingly connected with the portrait.

Lichtenberg's comments hint at a practice of making claims about the credibility of texts which was common among the contemporary media and constituted an important factor in the social anchoring of both the scientist and the sciences in the second half of the eighteenth century. The connection of a particular work to the inalienable mental and emotional disposition of its scholarly author, established with the help of the portrait, can be considered as the consequence of seventeenth-century epistemological probabilism,[11] as well as of social change within the scholarly community. With the expansion of empirical natural philosophy,

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[8] On the significance of astrology with respect to (polemical) assessments of people in the sixteenth century, see the classic essay by Aby Warburg, 'Heidnisch-antike Weissagung in Wort und Bild zu Luthers Zeiten', in Dieter Wuttke (ed.), *Ausgewählte Schriften und Würdigungen* (Baden-Baden 1979), 199–304.

[9] Gérard Genette, *Paratexte. Das Buch vom Beiwerk des Buches* (Frankfurt/M. 2001). Genette's multi-facetted view of texts does not, however, include the portrait and its close relation to the author's reputation. On the adaption of Genette's concept to author portraits and frontispieces, see Christel Meier, 'Das Autorbild als Kommunikationsmittel zwischen Text und Leser', in Fondazione Centro Italiano di Studi sull'Alto Medioevo (ed.), *Comunicare e significare nell' alto medioevo* (Spoleto 2005), 499–538: 502–503; and Volker Remmert, *Widmung, Welterklärung und Wissenschaftslegitimierung. Titelbilder und ihre Funktion in der Wissenschaftlichen Revolution* (Wiesbaden 2005).

[10] Lichtenberg 1994 (note 2), III: 498.

[11] Barbara J. Shapiro, *Probability and Certainty in Seventeenth-Century England. A Study of the Relationships between Natural Science, Religion, History, Law and Literature* (Princeton 1983). Probabilism in the seventeenth century is distinctly different from the "Probabilistic Revolution" that arose around 1800, which refers to the application of mathematical probability theory to subject matter in the natural and social sciences. Lorenz Krüger, Lorraine J. Daston and Michael Heidelberger (eds.), *The Probabilistic Revolution*, vol. 1: *Ideas in History* (Cambridge and London 1987).

the subjectivity of human perception had become an urgent problem, to which the moral integrity of the scholar offered an answer that, while it could not ensure the truth, could at least ensure the credibility of his observations.[12] In brief, it was, paradoxically, a question of personality as to whether the personal could be separated from the generation of "pure" scientific facts. In the seventeenth century, and even later, it was primarily social class that guaranteed a person's ability to perceive correctly and communicate perception faithfully; in many cases this was the equivalent of being a member of the nobility, either by birth or by institutional association.[13] In the course of the eighteenth century, particularly in German-speaking areas, a new, bourgeois and well-educated elite came into existence.[14] This elite group functioned to a very considerable extent as the agents of professionalisation and institutionalisation of the sciences, but it could not lay claim to a metaphysical commitment to the truth as a quasi birthright. Instead, this socially heterogeneous group based its credibility on character as a moral entity that is inherent in the subject and is partly physiologically and partly habitually conditioned. According to physiognomic theory (and undoubtedly even more in accordance with popular knowledge), character could be recognised particularly in the countenance or in its representation, which explains why authors and readers attached a certain importance to frontispiece portraits. Hence if a scholar such as Albrecht von Haller took an interest in the quality and the "faithfulness" of his own portrait,[15] this should not necessarily be taken simply as an expression of vanity.

Based on these introductory observations, in what follows, the example of different statements made by Haller is used to examine the epistemic significance of the "figure of the savant", i.e. his physical appearance in its representation in various media as a constitutive factor in the plausibility, acceptance and dissemination of scientific knowledge. The focus is

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[12] See the seminal work by Lorraine Daston, 'Objectivity and the Escape from Perspective', *Social Studies of Science* 22 (1992), 597–618, and 'The Moral Economy of Science', *Osiris* 10 (1995), 3–24.

[13] Stephen Shapin, *A Social History of Truth. Civility and Science in Seventeenth-Century England* (Chicago and London 1994); Simon Schaffer, 'Self Evidence', *Critical Inquiry* 2 (1992), 327–362.

[14] Fritz K. Ringer, *Die Gelehrten. Der Niedergang der deutschen Mandarine 1890–1933* (München 1987), 23–47.

[15] Erich Hintzsche (ed.), *Albrecht von Hallers Briefe an Auguste Tissot 1754–1777* (Bern, Stuttgart and Wien 1977), 60, 452 and 481–482; Marie Therese Bätschmann, 'Haller im Porträt', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008), 497–514: especially 501–506.

on communicative "practices of knowledge" which cannot be counted as scientific practices in the strict sense but which nonetheless play a significant role in the social construction of scientific facts. The objective of the study is to demonstrate that the anthropological category of character assumed a key role in the development and theoretical foundation of new forms of empiricism.

Self-Observation and Self-Experiment

In his work entitled *Anthropologie in pragmatischer Hinsicht* (1798), Immanuel Kant (1724–1804) mentioned Haller—whose scientific and poetic works he apparently knew and admired—in connection with the dangers for the mind and the soul associated with continued and intense self-observation.[16] Haller had indeed repeatedly made himself the object of his own observation and examination, as evidenced among other sources by the posthumously published *Fragmente religiöser Empfindungen* (1787) from his diaries—to which Kant referred—as well as the two-part *Abhandlung über die Wirkung des Opiums auf den menschlichen Körper* (1776/1777). The *Fragmente* already documented not only Haller's life-long struggle with self-imposed duties of religious faith but also his attentiveness—increasing with age and illness—to his own health and its impacts on his emotional state.[17]

This more or less systematic introspection, in which he had engaged at least since 1736, was transformed into a professional activity by Haller in his *Abhandlung*, a report on an approximately four-year period of self-observation. In 1773 Haller contracted a painful inflammation of the urinary passage which he attempted to mitigate, although not to heal, with opium. He begins his report on the course of his illness and the effects of

[16] Immanuel Kant, *Anthropologie in pragmatischer Hinsicht*, ed. by Karl Vorländer (Hamburg 1980), I, 1, §4, 20.

[17] Albrecht von Haller, 'Fragmente religiöser Empfindungen', in Johann Georg Heinzmann (ed.), *Tagebuch seiner Beobachtungen über Schriftsteller und sich selbst. Zur Karakteristik der Philosophie und Religion dieses Mannes* (Bern 1787), 2 vols., II: 219–319; Urs Boschung, 'Albrecht von Hallers Krankheiten in seiner Korrespondenz', in Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005), 221–275. Haller was not an isolated case. Self-observation and its recording became a widespread practice among the middle class in the eighteenth century. See Gudrun Piller, *Private Körper. Spuren des Leibes in Selbstzeugnissen des 18. Jahrhunderts* (Köln, Weimar and Wien 2007). In particular, one's own medical history was a major feature of this phenomenon. See ibid., 265–276 and *passim*.

opium with a preliminary observation about his normal physical condition: "My urine was normally—*as is usual for scholars*—rather colourless and frequently had a common but certainly not offensive odour, and was also clear and free of sediment."[18] This physiological self-categorisation, by which Haller placed himself among the learned members of society, can be explained with reference to the topoi of uroscopic diagnosis: clear urine free of sediment had for centuries been seen as a symptom of melancholy, which in turn had long been considered the typical temperament of scholars.[19] According to Haller's colleague and long-time correspondent Auguste Tissot (1728–1797) of Lausanne, a melancholic could "observe and examine the same object in all its aspects and without distraction, remaining fixed on a single idea."[20] The melancholic was thus the ideal empiricist.

Haller's use of a humoralistic commonplace corresponds with a quite conventional form of argumentation found in autobiographical writings of the eighteenth century, which frequently drew upon temperament and character to justify personal success or failure.[21] Of importance here, however, is the fact that Haller was reacting to the impending epistemological dilemma of self-observation in a scientific context. In a case where the subject and the object of observation seem to be identical, the objectivity and hence the validity of findings based on observation are open to serious question. Haller's mention of a visible physical quality (urine colour) thus served to signify an invisible physical disposition (temperament) which, in turn, guaranteed his intellectual capability (as a scholar by nature)

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[18] Albrecht von Haller, *Abhandlung über die Wirkung des Opiums auf den menschlichen Körper* (Bern 1962), 8–9. "Lotium mihi solebat, ut solet litteratis, palladium satis et copiosum esse, et odore saepe grato, foetido nunquam, limpidum praeterea et absque sedimento." Albrecht von Haller, 'Commentatio de opii in corpus humanum efficacia', *Novi Commentarii Societatis Regiae Scientiarum Gottingensis* 7 (1777), 1–16: 4. See Andreas-Holger Maehle, 'Selbstversuche und subjektive Erfahrung in der Opiumforschung des 18. Jahrhunderts', *Würzburger medizinhistorische Mitteilungen* 13 (1995), 287–297; Karl S. Guthke, 'Bekenntnisse eines schweizerischen Opium-Essers: Hallers Briefe an Pringle', in id., *Die Entdeckung des Ich: Studien zur Literatur* (Tübingen and Basel 1993), 115–122.

[19] Michael Martin and Heiner Fangerau, 'Historische Umbrüche in der Harndiagnostik und ihre Visualisierung in "Frames"', *Der Urologe* 45 (2006), 742–748: 747; Michael Stolberg, *Die Harnschau. Eine Kultur- und Alltagsgeschichte* (Köln, Weimar and Wien 2009), 72–74. On melancholy as a disease of scholars, see Raymond Klibansky, Erwin Panofsky and Fritz Saxl, *Saturn und Melancholie. Studien zur Geschichte der Naturphilosophie und Medizin, der Religion und der Kunst* (Frankfurt/M. 2004), 334–350. Haller's first biographer already attested to his melancholy state of mind, referring to it as "hypochondria". See Johann Georg Zimmermann, *Das Leben des Herrn von Haller* (Zürich 1755), 366–368.

[20] Samuel Auguste David Tissot, *Von der Gesundheit der Gelehrten* (Zürich 1768), 76.

[21] Piller 2007 (note 17), 37–42.

to remain unbiased in observation and judgment of acute pathological and pharmaceutical disorders of the body. The scholar's body revealed his ability to objectify it. The implication of a difference between object and observer that is inherent in the subject was clearly reflected in the fact that Haller described the progression of his disease not only through an unvarnished presentation of the most intimate physical symptoms but also in terms of his changing sensations and moods. For although he reported moments of mental "fatigue", during which he was occasionally "incapable of a clear, sustained train of thought", as well as the dwindling of "mental and physical powers" when the effect of the opium wore off, his meticulous description of these conditions in particular made clear to readers that objective, scientific observation remained unaffected by vicissitudes of this sort.[22]

Jean Senebier (1742–1809) described how it was possible to perceive reliably even under conditions of pathological disorder in his *L'Art d'observer*, which was published in 1775 and reviewed by Haller in that same year:[23]

> As long as well-equipped senses that remain virtually unchanged have the same perceptions of the same objects at different times, it is natural to envisage changes in the degrees of most diseases that affect the senses and hence changes in the nature of their effects; and when one can perceive them, it cannot be difficult to guard against the falsities that they can generate.[24]

The senses, which Senebier understood as "instruments", are calibrated by experience, so to speak, so that any kind of intrinsic disturbance can be filtered out of what has been perceived. This indeed assumes a capacity for reflection that only an accomplished and experienced observer can possess.

Haller explicitly assured his readers that he had not experienced any diminishing of "mental capability or amount of working time" despite his increasing consumption of opium.[25] Even in one case where he took too high a dosage, it was "nevertheless not as if I had lost my sense of reason or could not perceive sensations."[26] The possibility raised here of not perceiving sensations implies that the body is not only an epistemic object

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[22] Haller 1962 (note 18), 13, 14, 16 and 20.

[23] Albrecht von Haller, 'L'art d'observer par Jean Senebier', *Göttingische Anzeigen von gelehrten Sachen* 50 (1775), 419–423.

[24] Johann Senebier, *Die Kunst zu beobachten* (Leipzig 1776), 2 vols., I: 102–103.

[25] Haller 1962 (note 18), 20–21.

[26] Ibid., 16.

but at the same time also takes on the role of an instrument whose data can be read by a distinctly separate cognitive entity.

The manifestation of the body in this dual role of object and instrument calls into serious question the widespread theory of the "disappearance" of the body among modern natural scientists and its claim to generalisability.[27] In the case of self-observation and self-experiment, it would be clearly wrong to say that the scientist has lost "the feeling of the unconditional actuality of this body of his, that is, the feeling of his *bodily authenticity*"—in so far as such feelings can be historiographically recorded to any extent.[28] On the contrary, in the rhetoric as well as in the theory of self-observation and self-experiment, "bodily authenticity" is among the inalienable conditions of cognition. Thus Haller, for example, referred to self-observation as a verification of the independence of the qualities of blood as well as of the basic immutability of the temperament: "The same person maintains—under very different nourishment, whether derived from plants or animals—his unchanged original habits and nature, which are related to his constitution, I have experienced this in myself, I might abstain from meat or wine, or I might partake of these things alternately."[29] Likewise, the existence and authenticity of one's own body are essential prerequisites that enable the disease- and narcotic-induced changes described by Haller in the *Abhandlung* to become an argument for his theories. Here, basically two types of empiricism can be distinguished, each with its own logic of generating objectivity. One is the intensive self-observation already mentioned, in which the states between the poles of pain and insensitivity, as well as the related mental and emotional states, are described in the sequence of their occurrence—which requires a great measure of credibility owing to claims made, in terms of form and content, about the distance of the subject from his physical perceptions. That the idea of a quasi-instrumental objectivity is linked

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[27] Werner Kutschmann, *Der Naturwissenschaftler und sein Körper. Die Rolle der "inneren Natur" in der experimentellen Naturwissenschaft der frühen Neuzeit* (Frankfurt/M. 1986); Franz Breuer, 'Wissenschaftliche Erfahrung und der Körper/Leib des Wissenschaftlers. Sozialwissenschaftliche Überlegungen', in Clemens Wischermann and Stefan Haas (eds.), *Körper mit Geschichte. Studien zur Geschichte des Alltags* (Stuttgart 2000), 33–50.

[28] Kutschmann 1986 (note 27), 404 [original emphasis]. In instances such as this the fundamental problem of Kutschmann's study becomes apparent. He overlooks the often rhetorical and topical character of self-pronouncements made by scientists and reconstructs an actual physical sensation out of them.

[29] Albrecht von Haller, *Anfangsgründe der Phisiologie des menschlichen Körpers* (Berlin 1759–1776), 8 vols., II: 231.; cf. id., *Elementa physiologiae corporis humani* (Lausanne and Bern 1756–1766), 8 vols., II: 147–148.

with this greater attention to non-quantifiable processes is evidenced by the programmatic use of an instrument as a metaphor by Jean-Jacques Rousseau (1712–1778) in his *Rêveries du promeneur solitaire* (1782), which he began writing in 1776:

> I shall make use on myself, in some respects, of the methods made use of by naturalists on the air, in order to know its daily state. I shall apply the barometer to my soul, and these operations, well directed and long repeated, may be productive of results as certain as theirs. But I shall not extend my undertaking quite so far. I shall content myself with recording the operations without endeavouring to reduce them to system.[30]

That Haller also completely renounced systemisation in this sense, when he admitted that he would "present only his observations" without advancing a "theory of opium", was no coincidence.[31] Indeed: allegedly unsystematised and theory-free observation and its likewise artless recording following only the principle of *ordo naturalis* promised an unvarnished picture of the nature of the body such as could be delivered otherwise only by unbiased measuring instruments.[32]

In a second type of empiricism, Haller did apply a concrete measuring instrument when seeking to register changes in the "unfeeling" part of the body.[33] For this he used a "clock that measured by the second", with which he determined the frequency of his pulse at different intervals from the point in time at which he absorbed opium. Haller thereby joined an already well-established tradition of quantitative self-observations and self-experiments, begun by the Italian physician Santorio Santorio (1561–1636), who took measurements of changes in his own weight caused by metabolism over a period of three decades.[34]

Both types of empiricism are obviously consistent with the physiological concept whose formulation earned Haller a place in the annals of medical history and historical anthropology. While measuring activity of

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[30] Jean-Jacques Rousseau, 'The Reveries of the Solitary Walker', in *The Confessions of J.J. Rousseau: With the Reveries of the Solitary Walker* (London 1783), 2 vols., II: 143–296: 153–154.

[31] Haller 1962 (note 18), 17.

[32] On the gesture of "naturalness" in scientific texts, see James W. McAllister, 'Die Rhetorik der Mühelosigkeit in der Wissenschaft und ihre barocken Ursprünge', in Helmar Schramm, Ludger Schwarte and Jan Lazardig (eds.), *Spektakuläre Experimente. Praktiken der Evidenzproduktion im 17. Jahrhundert* (Berlin 2006), 154–175.

[33] Haller speaks of the "feeling part of the body" as opposed to the heart. Haller 1962 (note 18), 8.

[34] Giuseppe Ongaro, 'Introduzione', in Santorio Santorio, *La medicina statica* (Florence 2001), 5–47.

the heart is concerned with irritability, i.e. muscular response to stimulus, observation of physical sensations is concerned with sensibility, i.e. nerval stimulus transmission. Although perhaps self-evident to Haller on the basis of his long-time practice of self-observation, his integration of systematic observation of sensations and mental states—particularly as presented in the *Abhandlung*—qualifies as an original contribution to the body of legitimate methods of empiricism in natural science. In Senebiers's *L'Art d'observer*, for instance—which on account of its merely compilatory character (as noted by Haller) was representative of methodological reflections in the empirical sciences at the time—one searches in vain for details on observation of internal states and processes.[35]

Haller appears to have realised by the 1770s at the latest that the qualities of his own sensibility constituted at least complementary arguments in support of his theory of their difference from irritability. In the German edition of his major work on physiology first published in 1753, *Von den empfindlichen und reizbaren Theilen des Menschlichen Körpers* (1772), he added a brief description of a self-observation that had already attained the status of an experiment: "As I suffered from gout myself, I performed the following experiment numerous times when the pain was greatest: I flexed the tendons of my large toe, which caused no pain until the angle made by the tendon reached the skin and stretched it, at which point the pain became unbearable."[36] For Haller, this was proof that the joints did not contain nerves and thus were insensitive to pain; hence the source of pain from gout was the nerves in or under the skin. There appears to be no doubt about the objectivity of this observation, given that this passage is found at the end of a series of descriptions of animal experiments and thus constitutes an argumentative conclusion and highpoint relating to the sensitivity of joints.

Already in the first edition of this work, *De partibus corporis humani sensilibus et irritabilibus*, Haller had dealt with the effects of opium on the

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[35] Senebier 1776 (note 24), I: 64–78. Senebier deals with the body of the scientist only when he treats the sensory apparatus as an "instrument" of observation. See ibid., I: 102–103 and 105.

[36] Albrecht von Haller, 'Von den empfindlichen und reizbaren Theilen des Menschlichen Körpers', in *Sammlung kleinerer Hallerischer Schriften* (Bern 1772), 3 vols., II: 1–103: 22–23. This passage was also not yet contained in the translation of this work that appeared in 1756. See id., 'Untersuchung von den empfindlichen (sensibiles) und reizbaren (irritabiles) Theilen des menschlichen Körpers', *Der Königlich-Schwedischen Akademie der Wissenschaften Abhandlungen* 15 (1756), 14–39 and 96–127. It is quite probable that the reason for this was the fact that Haller's gout first appeared in 1756. See Urs Boschung, 'Lebenslauf', in Steinke, Boschung and Proß 2008 (note 15), 15–82: 47.

(animal) organism, and had determined that the drug reduced the sensibility of the nerves and the irritability of most muscles, while the activity of the heart remained largely unaffected. This relative non-involvement of the heart was challenged not long afterwards by the Scottish physician Robert Whytt (1714–1766) on the basis of his own animal experiments, which showed reduced heart frequency under the influence of opium.[37] Supported by students, followers and epigones, an extraordinarily lively debate between the two scholars ensued in the following years, which subsided for the most part after Whytt's death in 1766. As Andreas-Holger Maehle has shown, Haller referred to this controversy in his *Abhandlung* when he reported on increased activity of the heart following consumption of opium, which contradicted other sedating effects and thus was further confirmation of the theory that irritability and sensibility were independent of each other.[38]

The decisive change in this continuation of a debate that had taken place more than twenty years before lies, however, in the transformation of the epistemic object. Haller and Whytt had originally obtained most of their empirical results from vivisections and therefore had to extrapolate from a disturbed to an intact organism, and transfer their observations more or less explicitly from animals to humans. In response to Whytt, Haller had expressed criticism of the value of the findings of his learned opponent's experiments: "Opening an animal's abdomen or severing its head or spinal cord in order to study the more or less slow effects of a toxin is certainly not the proper way to ascertain the truth."[39] This does not constitute a fundamental rejection of animal experiments, which would also have applied to Haller's own research;[40] rather, it raises questions about the adequacy of means as well as their epistemic value. Compared with animal experiments, which involved "too much uncertainty",

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[37] On the dispute between Haller and Whytt, see Andreas-Holger Maehle, *Drugs on Trial. Experimental Pharmacology and Therapeutic Innovation in the Eighteenth Century* (Amsterdam and Atlanta 1999), 158–162; Eugenio Frixione, 'Irritable Glue. The Haller-Whytt Controversy on the Mechanism of Muscle Contraction', in Harry Whitaker, Christopher U.M. Smith and Stanley Finger (eds.), *Brain, Mind and Medicine. Essays in Eighteenth-Century Neuroscience* (New York 2007), 115–124.

[38] Maehle 1999 (note 37), 162.

[39] "Ouvrir le ventre d'un animal, lui couper la tête ou la moelle de l'épine, pour connoitre les effets plus ou moins lents d'un poison, n'étoit surement pas le moyen d'apprendre la vérité." Albrecht von Haller, 'Response à la critique de M. Whytt', in *Mémoires sur les parties sensible et irritables du corps animal* … (Lausanne 1762), 4 vols., IV: 99–133: 131.

[40] In this sense, Maehle is spotting a self-contradiction of Haller's that originated in his rhetoric of controversy. See Maehle 1999 (note 37), 159.

Haller's self-observation laid a greater claim to truth, as observation was made directly on a human organism which did not have to be damaged in order to be studied, with the result that the effect of the drug could be observed in its entirety.[41] Self-experiments proved, in brief, to be non-invasive vivisections of the human body. In its literary representation, the "figure of the savant", i.e. the "image of the body" compiled from different direct and indirect assertions, assumed the function of making the physiological norm (in this case the effect of opium on the heart muscle) visible despite—or perhaps better in—pathological deviation.

Character and Privacy

The transformation of his own body into a discrete epistemic object, which Haller presented in his *Abhandlung*, had already been anticipated to a certain extent by the strict separation of body and soul as a consequence of the distinction between sensibility and irritability.[42] In the so-called *Kleine Physiologie* (*Primae lineae physiologiae*, 1747), Haller likewise provided detailed evidence that most of the body's vital functions were completely independent of the soul and the grasp of its volition.[43] In particular the heart, whose activity received special attention in the *Abhandlung*, functions as a relevant example of the autonomous movement of organs; simultaneously, this makes it an appropriate object for self-observation and self-experiment, as it cannot be manipulated by the mere power of the mind. But the most impressive picture of this separation bordering on alienation appeared in Haller's work *Von den empfindlichen und reizbaren Theilen* in the form of an amputation fantasy which—as was frequently the case in his accounts of sensations—he described in the first person: "And if I cut off one of my fingers or if a bit of flesh is separated from my leg, neither the finger nor the missing flesh concerns me any longer; I no longer imagine what these parts suffer, I no longer feel pain from them, I no longer have any thoughts about their injury. The severed finger and the torn off muscle are not inhabited by my soul or by any part of it . . ."[44]

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[41] Haller 1962 (note 18), 5–8.

[42] Philipp Sarasin, *Reizbare Maschinen. Eine Geschichte des Körpers 1765–1914* (Frankfurt/M. 2001), especially 52–57 and *passim*.

[43] Albrecht von Haller, *Grundriß der Physiologie für Vorlesungen* (Berlin 1781), 2 vols., I: 367–371.

[44] Haller 1772 (note 36), II: 58. Cf. id., 'De partibus corporis humani sensilibus et irritabilibus', *Commentarii Societatis Regiae Scientiarum Gottingensis* 2 (1752), 114–158: 138.

Moreover, the removed body part marked the interface between physiology and religion. In his *Briefe über einige Einwürfe nochlebender Freygeister* (1775–1777), Haller returned to the argument about the wounded body in order to refute Voltaire's concept of a material and expanded soul. Thus he maintained that with the exception of a certain part of the brain where the soul was located, not even injuries of the spine, although it is part of the brain, can deprive "the soul of its reason, consciousness and memory."[45] And even "after serious injuries and destruction of the brain" it was possible "through the reunification of its parts or, perhaps without this, merely by the will of God, for the soul to recover its memory and personality."[46]

The theoretical possibility of interference-free observation of disturbances to one's own body is based on the physiologically proven immaterial nature of the soul and the corresponding guarantee of its functions. The dualism of an infected and affected body as an epistemic object, on the one hand, and an uninfluenced, perceiving and discriminating mind (as part of the soul) on the other hand, which constitutes an epistemological necessity in Haller's *Abhandlung*, has a structural similarity with the *Paradoxe sur le comédien* formulated several years before by Denis Diderot (1713–1784). In this brief publication, Diderot argued that an actor can act out feelings convincingly only if he is not simultaneously experiencing them himself and if he maintains an emotional and intellectual distance from his persona.[47] The actor is not to "play" his role in the sense of individual and spontaneous expression; rather he should "embody" it by making his body a medium of clear and objective signals.[48] The basic prerequisite for the success of embodiment in this respect is suppression of physical signals conveyed by one's own acute feelings and emotions.

That the body has a basic media-like function that makes such embodiment at all possible was clearly stated by Haller himself in his *Kleine Physiologie*: "It is impossible to mistake the fact that the CREATOR has given characteristics to each of the passions so that we cannot deceive one another too easily in our social life. Particular muscles, primarily in the face, the voice and the eyes express the passions of the soul so precisely

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[45] Albrecht von Haller, *Briefe über einige Einwürfe nochlebender Freygeister wider die Offenbarung* (Bern 1775–1777), 3 vols., I: 274.

[46] Ibid., I: 276.

[47] Denis Diderot, *Paradoxe sur le Comédien. Ouvrage posthum* (Paris 1830).

[48] Erika Fischer-Lichte, 'Verkörperung/Embodiment. Zum Wandel einer alten theaterwissenschaftlichen in eine neue kulturwissenschaftliche Kategorie', in id. (ed.), *Verkörperung* (Tübingen and Basel 2001), 11–25: 12–13.

that they can also be captured by portrait painters."[49] The reference to the possibility of artistic imitation, by which Haller emphasised the explicit symbolic nature of facial expression, only appears to contradict the previously asserted certainty of making deceit more difficult. Rather, this remark underscores the fact that imitating the involuntary signs of emotional processes is a task for specialists—which makes it unsurprising that Haller, by virtue of these brief observations, in 1785 became a source of authority for the theory of acting based on semiotic arguments advanced by Johann Jacob Engel (1741–1802).[50]

As Diderot's actor instrumentalised his body into a medium that could express emotions, Haller transformed his body, in its literary representation in the *Abhandlung*, into a theatre of physiological and pharmaceutical phenomena by which he appeared to be unaffected in his function as an observer. This physical mode proved to be a logical continuation and internalisation of the anatomical view in which the body had always appeared as a stage.[51] The concept of character provided the anthropological foundation for this transformation, which accordingly provided the epistemological possibility of scientific self-experiment. The significance of character in assessing people and their merits was apparent, for example, in a passage in Haller's biography by Vinzenz Bernhard Tscharner (1728–1778), *Kurzgefasste Nachrichten von dessen Leben, Charakter und Werken* (1778), where Tscharner—as a matter of course—proposed details about Haller's stature, physiognomy and handwriting that were to be taken as indications of his character.[52]

Regardless of different theoretical models, however, the concept of character made possible an intrinsic division of the subject. According to Kant, whose explanations can be taken as representative of discourse on character in the second half of the eighteenth century, a person's character is formed by natural qualities (disposition, temperament) and, as the case may be, from acquired "mentality" [Denkungsart; character in a narrow sense].[53] A specific and characteristic mentality, however—fully

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[49] Haller 1781 (note 43), I: 364, §567.

[50] Johann Jacob Engel, *Ideen zu einer Mimik* (Berlin 1804), 2 vols., I: 113–114; Erika Fischer-Lichte, *Semiotik des Theaters* (Tübingen 1983), 3 vols., II: 156–177.

[51] Hartmut Böhme, 'Der Körper als Bühne. Zur Protogeschichte der Anatomie', in Helmar Schramm et al. (eds.), *Bühnen des Wissens. Interferenzen zwischen Wissenschaft und Kunst* (Berlin 2003), 110–139.

[52] Vinzenz Bernhard Tscharner, 'Albrecht von Haller. Kurzgefaßte Nachrichten von dessen Leben, Charakter und Werken', *Der Teutsche Merkur* 2 (1778), 248–266: 265.

[53] Kant 1980 (note 16), 226–239.

in the spirit of the Enlightenment—is accorded only to someone who "adheres to certain practical principles that he has irrevocably prescribed for himself through his own reason."[54] Regardless of the truth of these principles, they can be seen as offering the possibility of overcoming natural qualities: "It is not a matter of what nature makes of an individual but of what the individual *makes of himself*; for the former is a matter of temperament (in which the individual plays a largely passive role) while the latter makes him recognisable as having character."[55]

The emphasis on (elitist) self-creation of the subject clearly separates Kant's anthropological model from the concept of character in a society of estates, which tended to be typological and which was probably discussed most prominently in the work of Jean de la Bruyère (1645–1696). Simultaneously, in the idea of independence and self-determination contained in Kant's model, it is possible to see why the category of character became a basic building block in the metaphysics of the process of emancipation of the bourgeoisie. In other words: the development of a differentiated concept of character was a direct consequence of social change in the mid-eighteenth century. On the one hand, the concept of character represented the struggle for autonomy on the part of the economic and intellectual bourgeois elite. On the other hand, it functioned as the central moral authority of the subject—which first made this social development possible—by increasingly separating the possession of social competences such as sincerity, credibility and reliability from class and genealogical criteria.

Character has its true place in the private sphere—a space that first developed along with bourgeois society and which constituted its social and symbolic basis. This private sphere, where formation of the personality and self-observation are cultivated, is in principle related to a public—as Jürgen Habermas has shown in his seminal presentation of the development of the bourgeois public sphere.[56] The self-creation and self-insurance of the subject took place in public view in the salon or in letters and published diaries. At the same time, in communication, it was precisely through subjective areas such as intimacy, sensitivity and inwardness that the image of the private sphere as the sanctuary of freedom, sincerity and truthfulness was confirmed. The bourgeois private sphere established itself between

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[54] Ibid., 235.
[55] Ibid.
[56] Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society* (Cambridge 1991), 43–51.

the unreasoning state of nature and the unreasonable rules of a representative public and its institutions, and, in accordance with its self-image, was committed to the rules of reason alone and hence was predestined for the production of genuine knowledge.

The meaning of privacy for the cultures of knowledge in German-speaking areas in the eighteenth century has been elaborated over the last decade by studies on academic societies and "private" lectures. With respect not only to rules of access but also to pertinent symbols of privacy such as the robe—the virtually obligatory garment of the professor—these studies have shown that private gatherings were highly conventionalised and ritualised despite their professions of distance from the constraints of the university public and the general public.[57]

Haller's form of experiment on the self makes sense only against the background of bourgeois society. Approaches that attempt to explain the occurrence of scientific self-experiments at the end of the eighteenth century by referring to a "romantic unity of subjectivity and objectivity" through which the "study of the self… becomes a study of all of nature and the world" completely miss the point of Haller's investigation, his scientific interests, and the underlying socially based and anthropologically grounded epistemology.[58] On the one hand, by describing his own sensations and disclosing intimate details, Haller was making direct reference to contemporary publicity of private matters. On the other hand, Haller's character—as he had it presented in rich detail over more than forty pages in his biography, *Leben des Herrn von Haller* (1755), by his student Johann Georg Zimmermann (1728–1795)—stands in the background as a source of moral authority, a potential for self-objectification, and a basis of credibility.[59] It was not—or not only—the scientific authority he

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[57] William Clark, 'On the Table Manners of Academic Examination', in Hans Erich Bödeker, Peter H. Reill and Jürgen Schlumbohm (eds.), *Wissenschaft als kulturelle Praxis, 1750–1900* (Göttingen 1999), 33–67; id., *Academic Charisma and the Origins of the Research University* (Chicago and London 2006), 93–140 and 150–158; and Martin Mulsow, 'Von der Tischgesellschaft zum Oberseminar. Zur historischen Anthropologie mündlicher Wissenskommunikation', in id., *Die unanständige Gelehrtenrepublik. Wissen, Libertinage und Kommunikation in der Frühen Neuzeit* (Stuttgart and Weimar 2007), 121–142.

[58] Birgit Griesecke, 'Einleitung', in Nicolas Pethes et al. (eds.), *Menschenversuche. Eine Anthologie 1750–2000* (Frankfurt/M. 2008), 33–65: 43. Basically, it can be maintained that, despite a few scattered publications, the theory and practice of self-experiment prior to 1800 has until now hardly received any attention as a subject of historical research.

[59] Zimmermann 1755 (note 19), 373–417; [Albrecht von Haller], 'Zürich (= J.G. Zimmermann, Das Leben des Herrn von Haller)', *Göttingische Anzeigen von gelehrten Sachen* 66 (1755), 615–616. On Haller's contribution to Zimmermann's work, see Erich Hintzsche,

acquired through many publications, but also his reputation as an unimpeachable, industrious and god-fearing person on which Haller could rely as the qualification that made his perceptions credible in the eyes of his readers without his having to call upon additional references. A century earlier, in the rare case of a self-experiment, this appears to have been unthinkable—as reported by the Italian physician Giogio Baglivi (1668–1707) in his *Dissertatio de anatome, morsu & effectibus Tarantula* (1695). An unnamed Neapolitan colleague of his had had himself bitten by two tarantulas "in the presence of six witnesses and a notary," in order to study the subsequent effects of the toxin on his own body, which lasted for several months.[60] Haller no longer needed eye witnesses or even people who could testify to the truth based on their profession in order to validate what he described—although the *Abhandlung* was not just concerned with his physical condition but with the resolution of a scientific question.

The extent to which Haller was concerned about how he was perceived by the public is known—his erstwhile panegyrist Zimmermann even openly accused him a few years after his death of thirst for glory.[61] The reason, however, why the thoroughly bourgeois practice of demonstrative self-determination was particularly distinct in Haller's case was that, in addition to a psychological component, it also had an epistemological bearing. This was apparent, for instance, in Haller's view of physiognomy as presented by Johann Caspar Lavater (1741–1801). In the third volume of his *Physiognomische Fragemente* (1777), Lavater expressed an opinion on Haller's frame of mind based on a sample of his handwriting: "The letters appear to be carelessly formed and strewn, but the lines are parallel. The former indicates phlegmatism, the latter tidiness. *Facility* and *neatness* are conspicuous."[62]

Haller reacted to the imputation of a phlegmatic temperament in October of the same year in an unmistakably defensive tone:

'Einige kritische Bemerkungen zur Bio- und Ergographie Albrecht von Hallers', *Gesnerus* 16 (1959), 1–15: 3–4.

[60] Giorgio Baglivi, 'Erste Dissertation Von der Anatomie, Biß und Wirckungen der Tarantel', in *Des vortrefflichen Herrn Georgii Baglivi . . . Zwey Bücher De Praxi Medica . . .* (Lübeck and Franckfurth 1705), 497–585: 566.

[61] Johann Georg Zimmermann, *Ueber die Einsamkeit* (Leipzig 1784–1785), 4 vols., II: 178.

[62] Johann Caspar Lavater, *Physiognomische Fragmente, zur Beförderung der Menschenkenntniß und Menschenliebe* (Leipzig and Winterthur 1775–1778), 4 vols., III: 115 [original emphasis]. The handwriting sample, remarkably, was not an excerpt from correspondence between the two scholars but apparently the postal address of Lavater's brother Diethelm.

> Is phlegmatism to be detected in one's handwriting? Does the writer of this initial inscription make himself suspected of this vice? What we find in it is a half-lame hand weakened by far too much writing, and haste in writing. If the writer had succumbed to phlegmatism and written slowly, there would have been no traces of weakness to indicate phlegmatism. And is handwriting not for the most part an imitation of the writing master?[63]

Haller objects that handwriting is a sign not of one's intrinsic nature but of how this nature has been overcome through work and imitation; thus it is a sign of one's own character as the result of rational self-determination.

The Epistemic Portrait

Changes in the visual self-fashioning of scholars can be better understood against the background of the concept of character. The significance of a portrait for the social construction of the figure of the savant was formulated by Lavater: "A truthful image is the only shield a great man has against all attacks stemming from envy—and the most appropriate safeguard against excessive praise."[64] As exaggerated as this assertion may have been even in Lavater's time, it leaves no doubt that the portrait fulfilled an important socio-epistemic function and also makes clear its relationship to an individual's work. An author's portrait, in particular, is more than just a decorative extra; rather, its purpose is to establish the image of a character that can provide crucial moral authority for the reception of his work, as in the case of Haller's self-observations and self-experiments.

By contrast with author portraits in the seventeenth century, who were portrayed in garments appropriate to their social status and with objects such as books and instruments that indicated their scholarly interests, the eighteenth century saw the prominent emergence of the motif of the "private"—frequently including the above-mentioned robe and a cap.[65] Benjamin Franklin, for instance, whose political career benefited not least from his fame as a scientist, purposely cultivated an anti-luxurious appearance during his stay in Paris between 1776 and 1785, as we learn

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[63] [Albrecht von Haller], 'Leipzig und Winterthur (= J.C. Lavater, Physiognomische Fragmente III)', *Göttingische Anzeigen von gelehrten Sachen* 124 (1777), 993–998: 995. Haller also refers to his "almost lame hand" in his autobiographical fragment. Albrecht von Haller, 'Aufzeichnungen Haller's über seine eigenen Lebensschicksale von 1753 an', in Emil F. Rössler (ed.), *Die Gründung der Universität Göttingen. Eine Sammlung bisher ungedruckter Entwürfe, Berichte und Briefe* (Göttingen 1855), 378–384: 378.

[64] Lavater 1775–1778 (note 62), II: 273.

[65] Kanz 1993 (note 3), 69.

from some of his letters, by failing to wear a wig and dressing in simple clothes. He also had numerous portraits made in this guise, copies of which were to be distributed in accordance with his wishes.[66]

Haller, too, is depicted in everyday dress in numerous representations.[67] Artur Weese's inventory of portraits of Haller contains 30 paintings and graphic depictions representing the iconography of the private—accounting for about one quarter of the total (excepting medals and sculptures).[68] The fact that these representations, which are based without exception on templates from the 1770s, depict Haller without signs of his official status by no means represents the "unscrupulous objectivity of a sober view that conceals nothing and presents what it sees without embellishment;" rather, it corresponds to a widespread convention.[69] For the artists—whose work Haller supported by sitting for portraits—it was not a matter of portraying him as a "sickly and discontented old man;" the concept of scholarly iconography had simply undergone fundamental change.[70] For his part, Haller pronounced himself satisfied with a copper engraving done by Balthasar Anton Dunker (1746–1807) which, although it showed him as an "old man" [v(i)eillard], nonetheless reflected his physiognomy.[71] Likewise, Lavater, who included two portraits of the scholar he so admired in the fourth part of his *Physiognomischen Fragmente* published the year after Haller's death, gave clear preference to the "private" with respect to physiognomic authenticity (fig. 1). He does not mention physical degeneration; rather, he describes the picture engraved by Heinrich Pfenninger as being the "truest" likeness, suitable for immediate physiognomic interpretation:

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66 Michael Müller, 'Franklin in Paris', in Kunst- und Ausstellungshalle der Bundesrepublik Deutschland (ed.), *Geist und Galanterie. Kunst und Wissenschaft im 18. Jahrhundert* (Leipzig and Paris 2002), [58–60]. See Brandon Brame Fortune, *Franklin & His Friends. Portraying the Man of Science in Eighteenth-Century America* (Washington 1999).

67 Marie Therese Bätschmann has pointed out that in addition to this, some paintings of Haller had a private function, i.e. they were located in the private quarters of close relatives where they were seen by guests. See Bätschmann 2008 (note 15), 498–501. These portraits, however, represented the previous iconography of scholars, depicting Haller with a wig, a book, and a professor's gown.

68 Artur Weese, *Die Bildnisse Albrecht von Hallers* (Bern 1909), no. 23–27, 31, 62–67, 84–86, 97–102, 106, 110–118 and 121–123. There are several variations among these portraits, as well as contemporary and later copies. This is also the case for the portraits that show Haller wearing a wig and a robe.

69 Ibid., 15.

70 Ibid., 69.

71 Bätschmann 2008 (note 15), 505.

Fig. 1. Albrecht von Haller, Etching after Heinrich Pfenniger in: Johann Caspar Lavater, *Physiognomische Fragmente, zur Beförderung der Menschenkenntniß und Menschenliebe* (Leipzig 1775–1778), 4 vols. IV: 253.

"The nose, although a little too large, is full of sagacity; the mouth and the chin alone show the finest interpretive understanding."[72]

Johann Georg Heinzmann (1757–1802), who published a posthumous edition of Haller's diaries (which have not been preserved), went a step further by including a portrait at the front as a title vignette that depicted not only the prominent physiognomy of Haller's profile but also—appropriately for the book's contents—showed him bare-headed and more or less "exposed." (fig. 2).

[72] Lavater 1775–1778 (note 62), IV: 253.

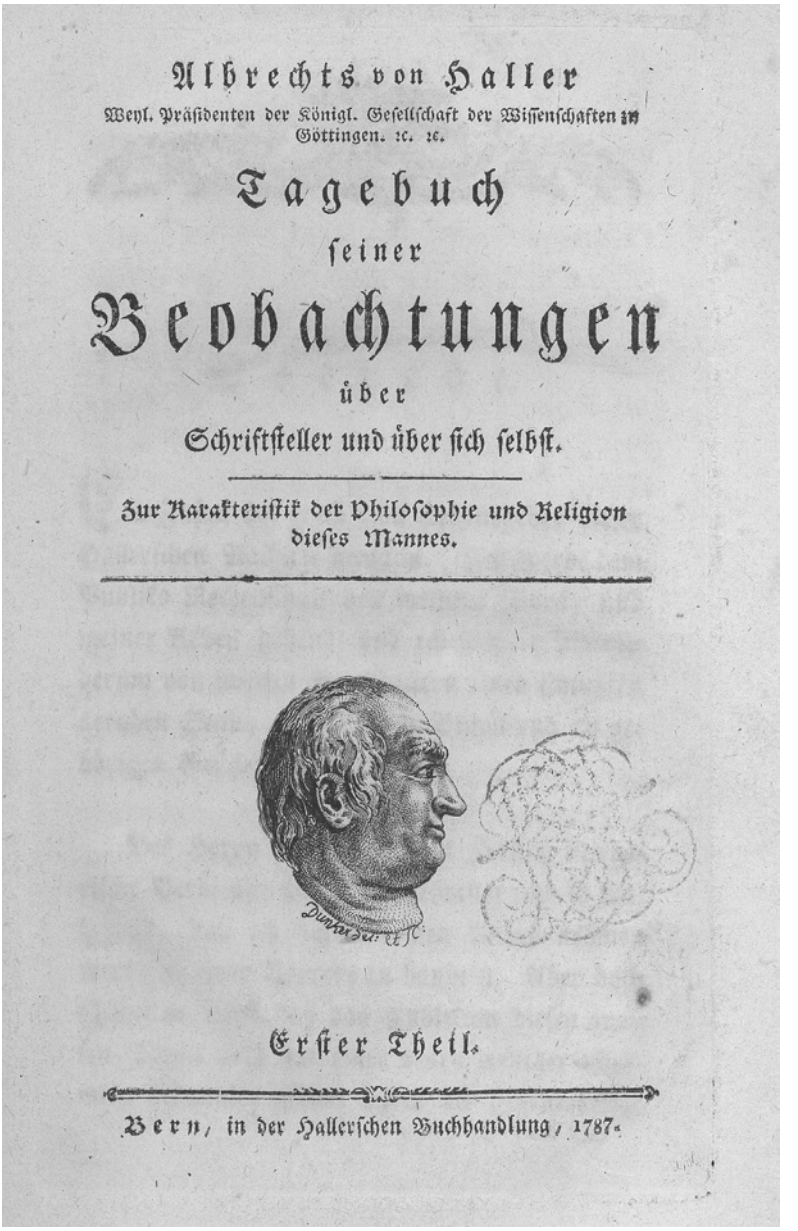

Fig. 2. Albrecht von Haller, Etching by Balthasar Anton Dunker, in Johann Georg Heinzmann (ed), *Albrechts von Haller [...] Tagebuch seiner Beobachtungen über Schriftsteller und sich selbst. Zur Karakteristik der Philosophie und Religion dieses Mannes* (Bern 1787), 2 vols., I: title page.

The crucial point is that the "private" portraits of Haller came into existence at a time when he increasingly incorporated his own body into his writings as an epistemic object and simultaneously more or less implicitly cited his character as a factor that would authenticate his scientific findings. The change in the exhibited self-image of the scholar, visible in the representations, gave Haller the epistemological possibility in his later years to transform bourgeois self-observation into a methodologically secure practice of knowledge. Presenting the scholar as a private person was tantamount to promising that the truth alone would be served beyond the constraints of society—more or less in the "natural state" of scientific pursuit. The fact that every form of scholarship and every variation in the "figure of the savant" is, of course, fundamentally artificial, despite all discursive and iconic assertions, was already maintained by Haller's bête noire, Julien Offray de La Mettrie (1709–1751), in *L'homme machine*, the celebrated and infamous work that he published in 1749: "We were not originally fram'd to become learned; nay it is perhaps by a sort of abuse of our organized faculties, that we become so".[73]

[73] Julien Offray de La Mettrie, *Man a Machine* (London 1749), 46.

REACTING TO ROUSSEAU: DIFFICULT RELATIONS BETWEEN ERUDITION AND POLITICS IN THE SWISS REPUBLICS

Simone Zurbuchen

Introduction

Jean-Jacques Rousseau was undoubtedly one of the most disputatious authors of the eighteenth century. Already at the beginning of his literary career he fell out with the *philosophes*, whom he denounced as a gang of charlatans. He later came into conflict with the political authorities of his native republic, Geneva, and eventually renounced the title of "citizen of Geneva" which he had so proudly advertised on the title page of some of his writings. Finally, he accused his saviour David Hume, who generously helped him obtain asylum in England, of conspiring with some of his worst enemies.

Since Rousseau was a disputatious author, it is not surprising that he provoked a wide array of reactions among the *savants* of his times, both by his utterly unorthodox writings and by his eccentric personality. This observation applies not least to the Swiss republics, where Rousseau and his writings became not just the object of scholarly controversies but also of political conflict. While Rousseau's deep entanglement with Genevan politics is fairly well known,[1] comparatively little attention has been paid to the question of how he was perceived outside Geneva. This essay sets out to explore on what occasions, in what form and with what intention Swiss *Men of Letters* reacted to Rousseau and his writings. In doing so, it aims to capture some of the essential features of the *savant* as a man of his times. These features will be presented in nine short sketches. Since the focus is on modes of perception and types of reaction, nothing like a concise overview of the reception of Rousseau's works within the Swiss

[1] For bibliographical references, see the article titled 'Geneva' in Raymond Trousson and Frédéric C. Eigeldinger (eds.), *Dictionnaire de Jean-Jacques Rousseau* (Paris 1996), 373f.; Helena Rosenblatt, *Rousseau and Geneva. From the* First Discourse *to the* Social Contract, *1749–1762* (Cambridge 1997); Gabriella Silvestrini, 'Le républicanisme de Rousseau mis en contexte: le cas de Genève', *Les études philosophiques* 4/83 (2007), 519–541; Richard Whatmore, 'Rousseau and the *Représentants*: The Politics of the *Lettres écrites de la montagne*', *Modern Intellectual History* 3 (2006), 385–413.

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republics is intended.[2] The basic idea, rather, is to uncover how the Swiss perceived their own role as *Men of Letters* in the face of Rousseau's thoroughgoing critique of the arts and sciences. This explains, on one hand, why special attention will be paid to the reception of the *Discourse on the Arts and Sciences* and of the *Letter to d'Alembert*. On the other hand, it also explains why this essay will not be exclusively concerned with those Swiss who functioned in the context of their native republics. It is well known that a number of Swiss *savants* emigrated to centres of the European *Republic of Letters*. Many, however, remained in close contact with their compatriots and continued to participate in Swiss intellectual discourse.

Failed Conversations

Isaak Iselin—a native of the Republic of Basle who was later to publish the first *philosophy of history* written in German language[3]—realized quite early in his career that Rousseau deserved to be taken seriously as a moral and political writer. At the age of 24 Iselin spent a few months in Paris in 1752. On this occasion he met several times with Rousseau in order to discuss with him the recently published *First Discourse*. Iselin was most interested to learn whether Rousseau wished in fact to condemn the arts and sciences without reserve, or whether he rather aimed to criticize their entanglement with the rich and the nobles in French Society. But

[2] The most extensive study of the subject is François Jost, *Jean-Jacques Rousseau suisse: étude sur sa personnalité et sa pensée* (Fribourg 1961), 2 vols. For the reception to Rousseau in Zurich, see Leonore Speerli, *Rousseau und Zürich. Vom Erscheinen des ersten Discours bis zum Ausbruch der Revolution in Frankreich* (Brugg 1941). For the articles and poems on Rousseau published by the *Journal Helvétique* between 1750 and 1782, see Rodolphe Zellweger, 'Jean-Jacques Rousseau et le Mercure Suisse', *Musée Neuchâtelois* (1983), 15–32, and Raymond Trousson, *Jean-Jacques Rousseau jugé par ses contemporains: du "Discours sur les sciences et les arts" aux "Confessions"* (Paris and Genève 2000). More recently the reception to Rousseau in Zurich has been studied by Barbara Mahlmann-Bauer, 'Johann Jakob Bodmers Rousseau-Lektüre', in Michèle Crogiez Labarthe (ed.), *Les écrivains suisses alémaniques et la culture francophone au XVIII^e siècle* (Genève 2008), 209–272, by Daniel Tröhler, *Republikanismus und Pädagogik. Pestalozzi im historischen Kontext* (Bad Heilbrunn 2006), 75–98, and by Francis Cheneval, 'The Reception of Rousseau's Political Thought by Zurich's "Patriots"', in Michael Böhler et al. (eds.), *Republikanische Tugend. Ausbildung eines Schweizer Nationalbewusstseins und Erziehung eines neuen Bürgers* (Genf 2000), 425–445. For the reception to Rousseau in Bern, see Béla Kapossy, *Iselin contra Rousseau. Sociable Patriotism and the History of Mankind* (Basle 2006), 180–207.

[3] See below.

Iselin was not satisfied by his conversations with Rousseau; rather, they prompted his increasing alienation from Rousseau and his writings.[4]

In his collection of essays entitled *Philosophic and Patriotic Dreams of a Friend of Mankind*, first published in 1755 and re-edited several times, Iselin openly attacked the *Discourse on the Arts and Sciences*. He called it "one of the most deceitful discourses", "a web of lofty contradictions", in which "the innocent sciences" were accused "of almost all the evils with which the human race is afflicted". Iselin readily concedes that the sciences are often abused and therefore have harmful effects on society. He insists, however, that erudition is indispensable, because truth is "the guide to virtue and by this means to happiness". According to Iselin, erudition is especially important in republics, since the freer one is the more discernment one needs: "In a monarchy it is the business of the Prince, of the ministers, to think, and those who are servants stand for the rest. We are, however, born with the right to be our own Princes, ministers, and magistrates . . . We would greatly deceive ourselves if we believed with Rousseau that we render an important service to the state if we banish from it sciences and erudition". According to Iselin, it is an important task of the government to make sure that every citizen is "enlightened" as well as "erudite".[5]

Communicating an Authentic Image: Reportage about Rousseau

Rousseau gained heightened attention in the Swiss republics when he arrived on Swiss soil on his way into exile from France. During the early 1760s, his name resounded throughout the land. Once he had settled in Môtiers, a small village in the then Prussian principality of Neuchâtel, a wave of pilgrimages took place.[6] Young *savants*, mostly from Bern and Zurich, seized the opportunity to make Rousseau's acquaintance, to engage in discussion with him, or to ask him for advice. To those who

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[4] This process of alienation is well documented in Iselin's diary. See Kapossy 2006 (note 2), 76–85; Ulrich Im Hof, *Isaak Iselin. Sein Leben und die Entwicklung seines Denkens bis zur Abfassung der "Geschichte der Menschheit" von 1764* (Basel 1947), 2 vols., II: 332–343.

[5] Quoted according to Im Hof 1947 (note 4), II: 336f.

[6] See Maurice Cranston, *The Solitary Self. Rousseau in Exile and Adversity* (Chicago 1997), 25–27; Tröhler 2006 (note 2), 96; Mahlmann-Bauer 2008 (note 2), 209f.; Kapossy 2006 (note 2), 188; Speerli 1941 (note 2), 46–67. Both Tröhler and Mahlmann-Bauer reiterate the claim that the historian Johann Heinrich Füssli visited Rousseau during his sojourn in Geneva in 1762. This claim has, however, been rejected by Ralph A. Leigh, *Correspondance complète de Jean Jacques Rousseau* (Genève and Oxford 1965–1998), 52 vols., XVII: 325f.

didn't have the chance to meet him in person, first-hand information about his opinions and his personality was communicated either through personal contact in one of the numerous reform societies that existed at the time or by way of correspondence. Of special importance was the salon of Julie Bondeli in Köniz, near Bern, which soon developed into a proper information centre.[7] By means of her extensive correspondence, this remarkable *Woman of Letters*—who was among Rousseau's greatest admirers—further disseminated the latest news about Rousseau, both within the Swiss republics and in the European Republic of Letters.[8]

How Rousseau was perceived by some of his Swiss contemporaries can be gathered from a report written by two of his visitors, who obviously intended to circulate it among their friends. One of these visitors was Jacob Wegelin, a native of the city of St. Gallen, who belonged to the circle around Johann Jacob Bodmer in Zurich. Wegelin appears to be the only Swiss author who was to publicly defend Rousseau's highly contested opinions about religion and to make use of some of the key arguments advanced in the *Social Contract* and in *Emile* in a treatise on Spartan legislation.[9] Wegelin's companion was a young man from Zurich who obviously expected Rousseau's advice in a personal matter.

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[7] Jost 1961 (note 2), I: 364.

[8] Cranston 1997 (note 6), 26 describes Bondeli in the following terms: "She was a formidable blue-stocking, so intensely serious that the poet Wieland, who loved her, complained that she drove him mad with her philosophical talk. Her adoration of Rousseau was almost fanatical. She was in effect the chief priestess in Allemanic Switzerland of the cult of Rousseau, '*das Haupt der Sekte von Rousseaus Bewunderern*', as she herself expressed it. She rejoiced in the knowledge that her Christian name was that of the heroine of *La Nouvelle Héloïse*. She gathered information about Rousseau from any source she could and passed it on to her numerous correspondents; there is hardly a letter of hers in which his name is not mentioned." Bondeli corresponded with Rousseau before she made his acquaintance in person. They only met in 1765, when Rousseau went on a visit to Neuchâtel where Bondeli was living at that time. See ibid., 120f. On Bondeli's relation with Rousseau's salon, see also Jost 1961 (note 2), I: 360–379. A critical edition of Bondeli's correspondence is now available: Julie Bondeli, *Briefe*, ed. by Angelica Baum and Birgit Christensen (Zurich 2012), 4 vols.

[9] Wegelin defended Rousseau's religious opinions in two dialogues. They are mentioned by Ralph A. Leigh in his 'Wegelin's visit to Rousseau in 1763', *Studies on Voltaire and the Eighteenth Century* 249 (1987), 303–332: 303 and 329 (note c and d). According to Leigh, the dialogues were published towards the end of 1763 in a volume entitled *Dialogues par un Ministre Suisse*. I was unable to obtain this book. Wegelin's treatise on Spartan legislation is entitled *Politische und moralische Betrachtungen über die spartanische Gesetzgebung des Lykurgus* (Lindau, Frankfurt and Leipzig 1763). In 1765 Wegelin was invited to Berlin at the instigation of Johann Georg Sulzer. He was appointed professor of history at the Royal Academy of Noblemen and became a member of the Royal Academy of Sciences and its archivist.

The two visitors arrived in Môtiers on 24 October 1763, and spent about ten days with Rousseau. Their report is rather long; it first deals with Rousseau's personal and moral character, then with his moral and political opinions on certain specific issues, and finally with Rousseau as a writer. As noted by Leigh, who published this report in the original French for the first time in 1987, it would be wrong to assume that these visitors took notes during their conversations with Rousseau. This would probably not have been tolerated by their host. Moreover, it would have contradicted their intention of retaining the authentic expression of Rousseau's feelings and opinions. It seems more probable that the visitors recorded keywords after every conversation. They then used them as a basis for their report, which they may have written down in the nearby pension where they spent the long autumn evenings. As soon as a part of the report was ready, it was sent off to Bodmer.[10] Since the authors must have been aware that Rousseau would have regarded publication of his confidential remarks as a breach of trust, the reportage was shown only to a select few, most likely to some of Bodmer's friends and disciples, but also to Julie Bondeli.[11] While the latter was quite aware of the confidentiality of the report, she nevertheless allowed it to be read first by Sophie von La Roche, her husband, and the poet Wieland, and later by her close friends Maria Jacobea Fels and Johann Jakob Zimmermann. The latter sent the report to Helferich Peter Sturz who published a German translation of it in his selected works of 1784.[12] Three aspects of the report are worth considering in some detail:

a) *Rousseau as outsider and eccentric*: To a large extent the report simply renders Rousseau's own remarks on various topics. Some of them can be understood as instructions about how a good citizen of a small republic ought to behave. The teaching that one needs to have character, that is, the capacity to think and to act independently, is introduced as Rousseau's important moral maxim, which would explain why he despised large societies where everything depends on externalities and appearances. In

[10] Leigh 1987 (note 9), 304 and 329 (note k). It seems that Wegelin was the main or even the only author of the report.

[11] Among them was Leonhard Usteri, a well-known friend and correspondent of Rousseau. See Paul Usteri and Eugène Ritter (eds.), *Correspondance de Jean-Jacques Rousseau avec Léonard Usteri* (Zurich and Genève 1910).

[12] Leigh 1987 (note 9), 304f. and 330 (note m); Wilhelm Körte (ed.), *Briefe der Schweizer Bodmer, Sulzer, Gessner. Aus Gleims literarischem Nachlasse* (Zürich 1804), 343 (note). For a reprint of Schulz' German version, see Leigh 1965–1998 (note 6), XVIII: 257–266 (appendix 325).

order to maintain his independence, Rousseau wished to live instead in a small society or republic, where a man still dares to distinguish himself from other men. The report then recalls that Rousseau derived two further maxims from the principle of liberty—a principle that only subsists in republics: First, to preserve one's liberty, a man needs to distinguish himself from the crowd and should never fear to be counted as eccentric. "I do not act, said he, like the others in small affairs, in order to get used not to become servile in great ones." In order to illustrate this maxim of Rousseau's the report added a description of his famous Armenian dress.[13]

b) *Rousseau's incorruptibility*: From the principle of liberty Rousseau derived the second maxim that a man ought always to follow his reason: "Reason, he cried, reason is the only quality worthy of a human being." According to the report, this maxim explains why Rousseau took the feeling of theoretical and practical evidence as his only guide and believed money to be the wrong measure of *esprit*, talents and true merit. From this the reporters conclude that Rousseau's rejection of pensions such as the one offered to him by the Prussian King, and of all kinds of donations did not originate in any kind of vain enthusiasm but was rather the result of the conviction that base self-interest is corrupting and introduces men into a state of forced subjection.[14]

c) *The paradox of the writer*: Those paragraphs of the report in which the authors mention Rousseau's comments on his profession as a writer are instructive in regard to the latter's attitude towards erudition: Rousseau is not at all proud of being a writer, since he prefers the rural Socrates—that is, the farmer whom Johann Caspar Hirzel had depicted as the model of a "philosophical" farmer—to the greatest *savant* in Europe.[15] He expresses deep aversion to all kinds of literary controversies and regrets having been misled into polemics in his first writings. Since he realised that polemics disturbed his inner peace, he stopped writing them; he now preferred being mistreated and torn to pieces by his enemies instead of sacrificing his internal tranquillity. The recently published letter, addressed to the archbishop of Paris, was however an exception, because it did not belong to

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[13] Leigh 1987 (note 9), 308f.

[14] Ibid., 309f.

[15] Hans Caspar Hirzel, *Die Wirthschaft eines philosophischen Bauers* (Zürich 1761). The first French translation entitled *Le Socrate rustique, ou, Description de la conduite économique & morale d'un paysan philosophe* was published in 1762. The first English translation dates from 1764. Rousseau had already praised the philosophical farmer when he first heard about Hirzel's account of Kleinjogg's household through his correspondence with Leonhard Usteri. Kapossy 2006 (note 2), 192f.

the genre of literary controversy but rather contained a personal defence. According to Rousseau, every man is obligated to defend himself if his honour and his conscience are at stake.[16]

Imitating a Hero and Martyr

In the reform societies of Johann Jacob Bodmer and his disciples, who called themselves *patriots*, Rousseau's writings helped to clarify their own understanding of truly republican politics. In the Zurich societies Rousseau's political writings—beginning with the *Second Discourse* and the *Letter to d'Alembert* up to the *Social Contract, Emile* and the *Letters written from the Mountain*—were enthusiastically welcomed. With the exception of Rousseau's opinions about religion, almost all of his moral and political ideas and arguments received consenting comments.[17] However, the *patriots* did not confine themselves to discussing republican principles in theory; they rather attempted to halt in practice the moral and political decay of their native republic. This is evidenced by their public campaigns against the ruling elite on the one hand, and by their renunciation of any kind of luxury in private on the other.[18] The fact that the *patriots* aimed to restore republican virtue by leading exemplary lives helps to explain why they were chiefly interested in Rousseau as a man and as a persecuted writer. They obviously identified his nonconformity and his steadfast opposition to corruption, which Wegelin so aptly described in his report, as the mode of life of a true republican hero.

While all attempts to provide Rousseau with a safe refuge in Zurich failed, Bodmer and his disciples continued to express their unreserved admiration for him and to advertise themselves as his only true friends.[19] At least for some of the more radical *patriots*, being a true friend of Rosseau's obviously implied displaying simplicity and modesty even in outward behaviour. It seems that the *patriots* used to wear simple black clothing and ostentatiously abstained from social life. This is why they

[16] Leigh 1987 (note 9), 308.

[17] Tröhler 2006 (note 2), 75–98; Mahlmann-Bauer 2008 (note 2), 210–215; Cheneval 2000 (note 2), 434–444.

[18] The most spectacular political action was directed against the bailiff Felix Grebel, who was publicly denounced for corruption. The documents related to the famous Grebel affair are now available in Johann Caspar Lavater, *Ausgewählte Werke in historisch-kritischer Ausgabe*, vol. I/I: *Jugendschriften 1762–1769. Der ungerechte Landvogd, Zwey Briefe an Magister Bahrdt, Schweizerlieder*, ed. by Bettina Volz-Tobler (Zürich 2008), 39–187.

[19] See Mahlmann-Bauer 2008 (note 2), 216–243.

were denounced as "eccentrics" and ridiculed in public.[20] In the eyes of the *patriots* such allegations merely confirmed Rousseau's teaching that a true republican hero does not depend on public opinion and is not afraid to be counted as eccentric. This much can be gathered from an article published by the historian Johann Heinrich Füssli in the moral weekly *Der Erinnerer*.[21] Here Füssli argued that a true *patriot* needed to display a kind of "fanaticism" if he wanted to demonstrate that integrity was not a chimera and that virtue was still possible in a corrupt world. Moreover, he advised the government that any attempt to prosecute the *patriots* would be futile. For in the face of intolerance and persecution the latter would merely be turned into "martyrs".[22]

Defending an Outlaw: Appeal to Humanity

The way in which Wegelin's reportage was received within the reform circles of Zurich is further evidenced by the *Remarks on the Writings and Conduct of J.J. Rousseau*, published by the painter Johann Heinrich Füssli in the context of the Hume affair in 1767.[23] As one of the main protagonists of the so-called Grebel affair in Zurich,[24] Füssli originally belonged to the circle of the *patriots* who enthusiastically welcomed Rousseau's political writings. On his way to England in the aftermath of this affair, he must have changed his mind, however. As we can gather from his ambivalent attitude towards Rousseau in the *Remarks*, he became much more realistic about the prospect of republican reform. On the one hand, Füssli still wished to defend Rousseau against unjustified allegations. He thus rejects the charge that his writings would be paradoxical and contradictory, and he also defends Rousseau's integrity as a man and a writer. By doing so, he repeatedly quotes the report about Rousseau. In Füssli's account the

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[20] See Bettina Volz-Tobler, *Rebellion im Namen der Tugend. "Der Erinnerer"—eine moralische Wochenschrift in Zürich 1765–1767* (Zürich 1997), 139–144; Tröhler 2006 (note 2), 81f.

[21] Not to be mistaken for the painter Füssli or Fusely. Füssli "*zum Feuermörser*" was a local activist and historian who was to succeed Bodmer as professor of history at the local high school. The moral weekly "*Der Erinnerer*" has been analyzed by Volz-Tobler 1997 (note 20).

[22] For an analysis of Füssli's defence of "fanaticism", see Simone Zurbuchen, 'Politische Tugend zwischen Vernunft und Fanatismus. Zur moralphilosophischen Begründung des Republikanismus im 18. Jahrhundert', in Helmut Reinalter (ed.), *Aufklärung—Vormärz—Revolution. Jahrbuch der "Internationalen Forschungsstelle Demokratische Bewegungen in Mitteleuropa von 1770–1850" der Universität Innsbruck* 21 (Frankfurt/M. 2001), 11–25.

[23] Johann Heinrich Füssli, *Remarks on the Writings and Conduct of J.J. Rousseau*, ed. with introduction, German translation, and commentary by Eudo C. Mason (Zurich 1962).

[24] See note 18 above.

report demonstrated that Rousseau's complaints about his misery and his poverty did not result from mere charlatanry but were rather founded on a reasonable maxim. Moreover, it also proved that Rousseau was quite consistent in rejecting all kinds of literary controversies. For that reason Füssli praises Rousseau as "the purest moralist" and as "the most penetrating politician". He also credits him with being "a good man" and asks his contemporaries to treat him "humanly".[25]

On the other hand, Füssli wanted to suggest that Rousseau was indeed wrong, both in his writings and his suspicions about Hume. The main problem with Rousseau's moral and political doctrines was that they could not be applied to the societies of his times. Füssli readily concedes the truth of the arguments against introducing a theatre in a small city-state that Rousseau defended in the *Letter to d'Alembert*. He doubts, however, whether the Republic of Geneva had in fact been able to maintain its moral integrity and the simplicity of its manners as Rousseau suggested.[26] Since Füssli was convinced that the Swiss republics had fallen prey to corruption, it seemed wrong and even dangerous to him to apply to them an ideal theory of the republic of the kind Rousseau had developed in his political writings:

> Of this [the fact that true politics are to a corrupted state what the physic of youth is to decrepitude, SZ] I make no other application than, that little can be learnt now from the Political Writings of Rousseau. The simplicity, the clear filiation of ideas in the *Contract Social*, must be confusion in our order of things; the discourse on Oeconomy in the State may be looked upon as superfluous; the *Projet de Paix* is the dream of a purblind schemer; the Letters from the Mountain have overturned Geneva, say those who call Liberty reclaiming her rights, rebellion; and even his friends must be content with applying to him what Cicero said of the younger Cato: 'He does more harm than good; for he mistakes the dregs of Romulus for Plato's republic'.[27]

To Win Someone over for a Scholarly Project: Why a Possible Collaboration Failed

Following this digression into the debate over Rousseau at the time of the Hume affair, we shall return to the period when Rousseau became an object of enthusiasm. To this period belongs the foundation of the Patriotic

[25] Füssli 1962 (note 23), 91.
[26] Ibid., 86f.
[27] Ibid., 88.

Society in Bern. Unlike the societies founded during the same period in Zurich, which had a decidedly political orientation, the Patriotic Society was rather an erudite reform society. Its founders aimed to provide a major contribution to the development of a "science of legislation" and of a "natural doctrine of morals" by means of launching a series of prize questions addressed to some of the major European *savants*. Well-known intellectuals such as Johann Georg Sulzer, Johann Georg Zimmermann, Moses Mendelssohn, Henry Home Lord Kames, John Brown, David Hume, Adam Smith, d'Alembert, Denis Diderot, Helvétius and Algarotti were invited to contribute to this project.[28]

Some of the leading members of the society also hoped to win Rousseau over as a supporter of their cause. To be sure, Rousseau had already explained to them why he thought that the society was doomed to failure. In his view, it was impossible to make men virtuous by teaching them the truth; this is why he deemed books, academies, and erudite societies to be utterly useless. Rousseau also surmised that the Patriotic Society would give rise to the opposite of what was intended by prompting its members to gain reputation and glory in the *Republic of Letters* instead of making true *patriots* of them.[29] Despite these critical remarks of Rousseau's, some of the leading members of the society went to see him in Môtiers. All they came away with, however, was the confirmation of his critical attitude towards the project of the society. Rousseau even recommended that the young patrician Nikolaus Anton Kirchberger—whom Bondeli praised for his tremendous erudition in one of her letters to Zimmermann[30]—renounce his ambition as a writer and concentrate instead on his domestic life and on Christianity in order to prepare for a career as a future magistrate. If the young Swiss continued to gain merit by writing, the republics would soon be guided by insignificant writers instead of great men. Not everyone was destined to become a Haller.[31]

Even if the Patriotic Society had not halted its projects after only a few years, the intended collaboration with Rousseau would have been doomed to failure. This was partly due to Rousseau himself, and partly to the influence Isaak Iselin exercised on the young Bernese *Men of Letters*.

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[28] On the Patriotic Society, see Kapossy 2006 (note 2), 153–157.

[29] Rousseau sent a letter to the Patriotic Society on 29 April 1762. See Leigh 1965–1998 (note 6), X: 225–229. My account of the relationship between Rousseau and the Patriotic Society relies on Kapossy 2006 (note 2), 185–192.

[30] Bondeli 1930 (note 8), 93.

[31] Letter to Kirchberger of 17 March 1763, in Leigh 1965–1998 (note 6), XV: 285–288. See Kapossy 2006 (note 2), 190f.

Thoroughgoing Rejection: Against the Fashionable Wisdom of Characterising the State of Savageness as Good

Since Iselin had his own experience with Rousseau, he was convinced from the beginning that the latter's position could not be reconciled with the ambitious project of the Patriotic Society. As a founding member of this society, Iselin took the prize questions as an opportunity to revise one of his major manuscripts. He published it in 1764 under the title *History of Mankind* and dedicated it to the Patriotic Society.[32] The *History* consists of a thoroughgoing rejection of the major arguments advanced by Rousseau in the *First* as well as in the *Second Discourse*. Against Rousseau's pessimistic account of the process of civilisation, Iselin develops an optimistic vision of the history of mankind that relies on the steady spread of milder manners on one hand, and on the healthy effects of the arts and sciences on the other. With his rejection of the "fashionable wisdom" of characterising the state of savageness as good,[33] Iselin introduced *philosophy of history* as a new branch of philosophy in the German-speaking realm.[34]

Appropriating by Translation: Does Theatre Undermine the Republic?

Let us return again to Johann Jacob Bodmer and the Zurich *patriots*. Zurich is no doubt the only place in the German-speaking realm where Rousseau's radical social and political doctrines, such as his critique of private property or his theory of popular sovereignty, were not only approved, but also used to justify opposition against the ruling elite. However, this does not yet explain why the *Letter to d'Alembert* became a main focus of interest. At the instigation of Bodmer, the *Letter* was translated into German by Jacob Wegelin in 1761.[35]

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[32] Isaak Iselin, *Philosophische Muthmassungen: über die Geschichte der Menschhheit* (Frankfurt and Leipzig 1764); second edition entitled *Über die Geschichte der Menschheit* (Zürich 1768).

[33] This expression was used by Iselin in an addendum to the chapter 'Humanity' in the *Philosophic and Patriotic Dreams*. Quoted according to Im Hof 1947 (note 4), II: 338.

[34] Iselin's critique of the *Second Discourse* and his *History of Mankind* has been extensively analyzed by Kapossy 2006 (note 2), 173–304. See also Simone Zurbuchen, *Patriotismus und Kosmopolitismus. Die Schweizer Aufklärung zwischen Tradition und Moderne* (Zürich 2003), 90–95.

[35] The translation was entitled: *Herrn Rousseaus, Bürgers in Genf, patriotische Vorstellungen gegen die Einführung einer Schaubühne für die Comödie, in der Republik Genf; aus*

The city of Zwingli had displayed a hostile attitude towards theatre since the time of the Reformation.[36] In the same year Rousseau wrote the *Letter to d'Alembert*, Johann Conrad Wirz, Zurich's *Antistes*, delivered a sermon against theatre on the occasion of the permission for Conrad Ernst Ackermann's theatre company to play in the city.[37] While this no doubt helps to explain why Bodmer wanted to have the *Letter* translated into German, his keen interest in Rousseau's theatre critique was also related to his own ambition as a writer. Just at the time when Rousseau published the *Letter*, Bodmer began to draft his first political plays. While he conceived them from the very beginning as reading dramas and never intended them to be performed on stage, he must have been alarmed by the first rumours about Rousseau's critique of theatre. Based on the concept of morally useful poetry that he had developed together with Johann Jacob Breitinger in the treatise *Critical Poetry*,[38] Bodmer intended to use the political play as a means for political and patriotic instruction. His main strategy was to depict an exemplary republican hero intended for imitation by the reader. The privileged addressees of his plays were no doubt the *patriots*.[39]

As we know, Bodmer continued to write political plays despite Rousseau's opposition to theatre. He even used them as a means to transmit Rousseau's political doctrines to his readers.[40] How, then, did Bodmer justify the production of political dramas in light of Rousseau's critique? The answer to this question can be found in the article "Political drama" writ-

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seinem Schreiben an Herrn d'Alembert gezogen; nebst einem Schreiben eines Bürgers von Sanct Gallen; von den wahren Angelegenheiten einer kleinen, freyen kaufmännischen Republik (Zürich 1761). On Wegelin, see note 9 above.

[36] See Thomas Brunnschweiler, *Johann Jakob Breitingers "Bedencken von Comoedien oder Spilen". Die Theaterfeindlichkeit im Alten Zürich. Edition, Kommentar, Monographie* (Bern 1989); id., 'Johann Jakob Breitinger und die Theaterfeindlichkeit im Alten Zürich', in Anett Lütteken and Barbara Mahlmann-Bauer (eds.), *Johann Jakob Bodmer und Johann Jakob Breitinger im Netzwerk der europäischen Aufklärung* (Göttingen 2009), 297–313.

[37] Cheneval 2000 (note 2), 435.

[38] Johann Jakob Breitinger, *Critische Dichtkunst* (reprint of 1740 edn., Stuttgart 1966), 2 vols.

[39] See Simone Zurbuchen, 'Aufklärung im Dienst der Republik: Bodmers radikalpolitischer Patriotismus', in Lütteken and Mahlmann-Bauer 2009 (note 36), 376–399: 393–396; on Bodmer's political dramas, see also Arnd Beise, ' "Republikanischer und historischer als unsere Kadaver von Republiken vertragen können". Bodmers ungedruckte vaterländische Dramen', ibid., 327–349; Thomas Maissen, ' "Mit katonischem Fanatisme den Despotisme daniedergehauen". Bodmers *Brutus*-Trauerspiele und die republikanische Tradition', ibid., 350–364.

[40] See Mahlmann-Bauer 2008 (note 2), 243–258.

ten by Bodmer for Johann Georg Sulzer's *General Theory of the Fine Arts*. Based on the distinction between the "French" and the "Greek" theatre, Bodmer was able to avoid any obvious contradiction between Rousseau's critical attitude towards the performance of theatre plays in a republic and his own performance as a writer.[41]

To be sure, Bodmer agrees with Rousseau that the performance of theatre plays has harmful effects in the context of a republic, because these plays focus on the "personal affairs" of their protagonists, address the spectators as private men and tear them out of their national, civil and economic affairs. He also insists, however, that this critique only applies to the "French" theatre conceived for monarchies, while the "Greek" theatre conceived for republics is of an altogether different nature. As political theatre the "Greek" theatre originally aimed to impress "patriotism, political concepts, popular feelings" on the spectators' minds. According to Bodmer, this was still possible in his own time. However, since there were only few "popular patriotic persons" left, the "Greek" theatre would fail in its aim should it be performed in public. This is why his own plays were not addressed to the majority, but only to those of his compatriots "who make of the government and of its conditions . . . an affair of their heart and of their mind".[42]

While Bodmer's account of theatrical plays was more nuanced than Rousseau's, he seems to have agreed with Rousseau's arguments against the foundation of a permanent theatre in the context of Zurich. In 1780, when Felix Berner from Vienna asked the government for permission to give a guest performance in the city, the issue of theatre once again became the object of public debate. In this context, Wegelin's translation of the *Letter to d'Alembert* was extensively discussed in one of the *patriots'* reform societies. Together with a statement against theatre that a group of citizens addressed to the government, a text read in the Historical-Patriotic Society amply demonstrates that opposition to theatre by then no longer rested on religious grounds but was justified on the basis of Rousseau's moral and political arguments.[43]

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[41] See Zurbuchen 2009 (note 39), 393–396.

[42] Johann Georg Sulzer, *Allgemeine Theorie der schönen Künste* (Leipzig 1771–1774), 2 parts, article titled 'Politisches Trauerspiel'. I refer here to the electronic version on URL: http://www.textlog.de/2884.html (accessed 19.08.2009).

[43] For an analysis of this text, see Cheneval 2000 (note 2), 437–440.

Facing the Challenge: The Usefulness of the Arts and Sciences

While Bodmer avoided any direct confrontation with the moral and political doctrines of the much admired Rousseau, Johann Georg Sulzer deemed it necessary to attack the latter's verdict against the arts and sciences at the roots. To be sure, Sulzer left Zurich as early as 1741 and made his career as a writer in the Prussian capital Berlin; he remained, however, in close contact with his former teacher Bodmer.[44] This explains, among other things, why Bodmer and the Zurich *patriots* thought about offering asylum to Rousseau in Berlin with Sulzer's help.[45] At the time this project was in the air, Sulzer had already launched a thoroughgoing critique of Rousseau's *First Discourse*. For him, the Prussian Academy of Sciences was the ideal stage for becoming a respected member of the *Republic of Letters*.

In a first discourse entitled *Thoughts about the Origin and the Different Employments of the Arts and Sciences* that he presented in 1757 on the occasion of Frederick II's birthday, he took issue with the *First Discourse*.[46] Sulzer rejects Rousseau's argument that the arts and sciences originate in human vices and aims to demonstrate how they contribute to the perfection of men by taming their "natural savagery" and promoting "thoroughgoing politeness"—a kind of politeness which has nothing to do with the "artificial politeness" criticized by Rousseau.[47] Relying on the principles developed by Bodmer and Breitinger in the *Critical Poetry*, Sulzer sees the arts and sciences as having two complementary tasks: it is the task of the sciences to discover the truth and to teach it to the world, while the arts have to embellish it and to render it agreeable. As a consequence, the sciences are reserved to an elite of philosophers who dispose of enough leisure and of the capacity to do sophisticated research, while the arts, which affect the senses and the imagination, are addressed to all men. Since the artist is able to arouse passions, he is in a way "master of the

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[44] The correspondence between Bodmer and Sulzer lasted from 1744 until 1779. It is printed in part in Josephine Zehnder-Stadlin, *Pestalozzi. Idee und Macht der menschlichen Entwicklung* (Gotha 1875), 385–454.

[45] See Mahlmann-Bauer 2008 (note 2), 235.

[46] Johann Georg Sulzer, *Pensées sur l'origine et les différens emplois des sciences et des beaux-arts* (Berlin 1757). German translation in J.G. Sulzer, *Vermischte philosophische Schriften. Aus den Jahrbüchern der Akademie der Wissenschaften gesammelt* (Leipzig 1773–1781), 2 vols., II: 110–128.

[47] I refer here to the German translation in Sulzer 1773–1781 (note 46), II: 118.

human heart".[48] He needs philosophy as his own master in order to make sure that art does not degenerate into flirtation and go astray. According to Sulzer, the most distinguished men of his time needed to collaborate in order to contribute to men's wisdom and happiness.[49]

In a further discourse presented to the Academy in 1760, Sulzer took issue with Rousseau's critique of theatre.[50] He readily conceded that the great majority of modern theatre plays did not live up to their moral purpose; Rousseau was thus right when he maintained that theatre would promote the corruption of modern societies. Sulzer insisted, however, that Rousseau was wrong when he criticized the institution of the theatre as a whole. His *first* argument is directed against Rousseau's claim that theatre plays could never inspire feelings or moral convictions that the spectator does not already have. If this was indeed the case, it would be impossible to explain the moral decay of contemporary societies—a phenomenon that Rousseau no doubt acknowledged. If one further agrees with Rousseau that men are born good, the corruption of their judgment and of their feelings cannot otherwise be explained than by assuming that men follow the example of their corrupt fellow beings. This clearly shows why men can learn from examples presented on stage.[51] Sulzer's *second* argument aims to demonstrate that an act on stage cannot be understood as a mere reproduction of historical reality. While the historian needs to stick to facts, the poet is able to express moral truths by concentrating on the essentials of things. Dramatic poetry has an even better chance to instruct the spectator than mere experience, because the latter shows persons merely in their outward appearance.[52] Sulzer concludes from this that theatre plays are best suited to lead corrupt men back to virtue.

Against Rousseau's overall denunciation of the arts and sciences, Sulzer advanced a strategy of perfection. His idea was to gradually improve men by means of the arts and sciences. To be sure, he fully agreed with Rousseau that in modern times the arts had undergone a process of decay and therefore missed the proper purpose of instructing men and of making them virtuous. According to Sulzer, this can, however, be explained by the fact that the arts were abused by the rulers who separated their private

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[48] Ibid., I: 119.

[49] Ibid., I: 128.

[50] Johann Georg Sulzer, 'Réflexions philosophiques sur l'utilité de la poésie dramatique', in *Histoire de l'Académie Royale des Sciences et des Belles-Lettres de Berlin 1760* (Berlin 1767), 326–340. German translation in Sulzer 1773–1781 (note 46), I: 146–165.

[51] Sulzer 1767 (note 50), 333f.

[52] Ibid., 329.

interest from the public interest. This was why the fine arts now resided in the palaces of the great that were closed to the people. If the arts were used at all on the occasion of public celebrations and ceremonies, they would merely serve as a means to dazzle the populace and to immunize the great against the disgust of such artificial celebrations.[53] Unlike Rousseau, Sulzer, however, saw no alternative in the attempt to preserve the allegedly still virtuous republics from decay by reviving ancient customs and celebrations. He rather recommended imitating the Greeks by redefining the proper moral and political purposes of the arts. In this context, theatre was deemed to play an important role. According to Sulzer, the proper place for a theatre was rather to be found in the capital of an enlightened monarchy like that of Frederick II than in one of the small Swiss republics.[54]

Inventing a Dialogue: Role Reversal

About the only substantial account of Rousseau's *Social Contract* outside Geneva was provided by Albrecht von Haller in his political novel of 1774, *Fabius and Cato*. As Haller observed in the preface, initiating a belated discussion of the *Social Contract* seemed important to him, since as a Bernese magistrate he was concerned with the political unrest in Geneva. Moreover, Haller was deeply worried about the spread of democratic opinions in the face of the struggle for independence in the English colonies in America and of widespread political complaints within the Swiss republics.[55]

The fourth book of the novel contains a dialogue whose main protagonists are the Athenian philosopher Carneades and the Roman censor Cato. For Haller's contemporaries, it was immediately clear that Athens and Rome stood for Geneva and Bern and that the dialogue between Carneades and Cato was in fact an exchange between Rousseau and

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[53] Sulzer 1771–1774 (note 42), article 'Künste, schöne', URL: http://www.textlog.de/7477.html (19.08.2009).

[54] On Sulzer's theory of the fine arts and of theatre, see Johan van der Zande, 'Thespis for and against: Sulzer and Rousseau on Theater and Politics', in Patrick Coleman et al. (eds.), *Reconceptualizing Nature, Science, and Aesthetics. Contribution à une nouvelle approche des Lumières helvétiques* (Geneva 1998), 231–246; Carsten Zelle, '"Querelle du theatre": Literarische Legitimationsdiskurse (Gottsched—Schiller—Sulzer)', *German Life and Letters* 62 (2009), 21–38: 34–38.

[55] Albrecht von Haller, *Fabius und Cato, ein Stück der Römischen Geschichte* (Bern and Göttingen 1774), 'Vorrede'.

Haller.[56] The dialogue was obviously inspired by the *Discourse on the Arts and Sciences*, where Rousseau had sympathised with Cato for having spoken out "against those seductive and subtle Greeks, who corrupted the virtue and destroyed the courage of their fellow-citizens", and for having predicted the fall of Rome unless the influence of the arts and sciences could be curbed: "Rome was filled with philosophers and orators, military discipline was neglected, agriculture was held in contempt, men formed sects, and forgot their country. . . . Before that time the Romans were satisfied with the practice of virtue; they were undone when they began to study it."[57]

Although Haller's Cato seemed similarly perturbed by the influence of Greek philosophy, his ire is less directed against the arts and sciences as such than against the scepticism with which the Greek sophist Carneades, meaning Rousseau, manages to capture the minds of his audience. While Carneades now appears as a seducer of young men who, because of his mastery of the Greek art of rhetoric, is able to sell falsehood as truth, Cato or Haller takes the role of a seasoned politician who relies "on deeper insights"; he is a friend of the sciences who, although able to speak Greek, prefers to discourse in Latin even when in Greece. He is extolled for the brevity and insistence of his writings that come "from the heart"—something that, Haller claims, even the Greeks would easily recognize.[58]

Through his dialogue between Carneades and Cato, Haller aimed to unmask Rousseau's pseudo-arguments and to defend the true principles of republican politics. He advances two important arguments against Rousseau. First, he claims that the doctrine of popular sovereignty would contradict the testimony of history and of reason. Second, he contends that in a small or medium-size state such as Bern, aristocracy is the best form of government. There is thus no doubt that Haller defends aristocracy against the democrat Rousseau. This observation alone tells us little about the quality of his arguments and of his assessment of Rousseau's writings, however. While Haller despised Rousseau as a person, he took a more nuanced attitude towards his writings.[59] This observation can be confirmed by a closer reading of his novel *Fabius and Cato*.

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[56] See Kapossy 2006 (note 2), 182f.

[57] I refere here to G.D.H. Dole's translation: *The Social Contract and Discourses by Jean-Jacques Rousseau* (London and Toronto 1932).

[58] Haller 1774 (note 55), 193–197.

[59] Haller reviewed the first and the second *Discourses* as well as the *Letter to d'Alembert* in the *Göttingische Gelehrte Anzeigen*. As Kapossy rightly observed, Haller appreciated the quality of Rousseau's philosophical arguments and was therefore ready to engage with

Haller fully agreed with Rousseau that the societies of his time were in decay. This explains why the dialogue takes place at a time when the Roman Republic is declining. Clear indications of this are the increase in wealth and luxury as well as the decay of manners. Haller also reminds the reader of the means used or at least envisaged by the Romans under Cato's lead to preserve ancient virtue and to check vice. Among the measures he mentions are sumptuary laws and provisions against theatre plays and theatre schools.[60] In this context he refers to two important arguments that Rousseau had advanced in the *Letter to d'Alembert*. The first of these arguments concerns the guild of actors. One of the dialogue partners reports that the "vicious instructors" taught young Romans, and even their daughters, dances "devoid of any shamefulness". Theatre schools are criticized as schools of vice and of lust, since "by the licentious liberty of these plays fornication, imposture, and all kinds of vices were taught the youth in the most agreeable manner".[61] The second argument takes issue with the content of theatre plays. While it remains uncontested that it could be agreeable and instructive "to see the manners of men, their appetites embodied in accurate representations on stage", this general remark is followed by the observation that the theatre plays of the times are exclusively concerned with fraudulence, adultery, and love. This is why they are held to detain young men from serious businesses such as ploughing the fields, and to weaken the shamefulness and chastity of young women.[62]

With his account of Rousseau's critique of theatre, Haller comes fairly close to the way the *Letter to d'Alembert* was interpreted by Rousseau's most radical admirers in the context of Zurich. While he agreed with them that measures such as sumptuary laws or provisions against theatre plays were appropriate means to save the existing Swiss republics from further decay, he clearly rejected the political doctrines of the *Social Contract*, since the latter would trigger dangerous reforms. This worry is expressed in one of the key arguments that Cato advances against Carneades' doc-

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Rousseau in a scholarly debate. He had, however, a less favourable opinion of Rousseau as a man and a writer. This emerges from his correspondence with the Genevan Charles Bonnet. Otto Sonntag (ed.), *The Correspondence between Albrecht von Haller and Charles Bonnet* (Bern et al. 1983); Florian Gelzer and Béla Kapossy, 'Roman, Staat und Gesellschaft', in Hubert Steinke, Urs Boschung and Wolfgang Proß et al. (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008), 156–181: 170–172. On Haller's correspondence with Bonnet, see also André Holenstein, 'Das Leiden des Gelehrten an der Demokratie', *UniPress* (*University of Bern*) 135 (2007), 24–25.

60 Haller 1774 (note 55), 172–189.

61 Ibid., 177f.

62 Ibid., 178–182.

trine of popular sovereignty: the Greek sophist is criticized for advancing a wrong idea of men by considering them to be "unselfish philosophers" who love their fatherland, have no selfish passions or intentions, and are enlightened enough to find the best solution even for the most difficult problems. According to Cato, political constitutions that entrust legislation to the people can easily be advertised "in the auditorium of an orator" but have devastating effects when they are realised in practice.[63] This is why Carneades was wrong to claim that all men are equal. Since it is impossible to enlighten the people and to instruct them in the art of governing a state, government needs to remain in the hands of the enlightened elite.[64] Based on these arguments, Haller, alias Cato, defends aristocracy as the best form of government.[65]

Conclusion

This essay has presented the figure of the *savant* from two different perspectives. The first has to do with modes of perception and forms of reaction; it focuses on the media of reaction and the choice of different literary genres. According to one well-known definition, the *savant* of the eighteenth century was simply a member of the *Republic of Letters*. The only requirement for becoming a member of this republic was writing. As Rousseau rightly observed in his response to the Patriotic Society, most if not all of the authors who participated in Swiss intellectual discourse can by no means be compared to Haller, who was then and still is considered to be the model of a "true" *savant*. While some of the Swiss authors referred to in this essay undoubtedly became respected members of the *Republic of Letters*, others belong rather to the category of occasional writers. While writing was an essential feature of a *Man* or *Woman of Letters*, reactions to a person, a book, an event, etc. could be expressed in different ways. We have seen that many Swiss were eager to meet Rousseau in person in order to listen to him, to engage in dialogue with him, or to

[63] Ibid., 222.

[64] Ibid., 211–222.

[65] In Rousseau's own terms, Haller defended aristocracy as the best constitution. Rousseau clearly distinguished between the constitution and the government of a state. This implied that while the legislative needed to be in the hands of the people, the executive could be entrusted to only a few. On Rousseau's distinction between constitution and government, see Simone Zurbuchen, 'Samuel Pufendorfs Lehre von den Staatsformen und ihre Bedeutung für die Theorie der modernen Republik', in Dieter Hüning (ed.), *Naturrecht und Staatstheorie bei Samuel Pufendorf* (Baden-Baden 2009), 138–160: 149–156.

win him over for a scholarly project. Moreover, discoursing about Rousseau and his writings either in the small circle of a reform society, in the *salon* of a *Woman of Letters*, or in front of the illustrious audience of one of the leading Academies of the times was also a way of reacting. Finally, imitating the conduct of what was perceived as a true republican hero was also an option. Of more lasting influence, however, were reactions in the form of published writings. While we have looked at only a few reactions to Rousseau, quite a number of literary genres came into play, ranging from confidential reports to the fully elaborated scholarly treatise. In between we find reactions in the form of critical remarks, essays, a translation, encyclopaedia entries, and a novel. This list is by no means exhaustive. Book reviews and correspondence have been mentioned here only occasionally; they would certainly deserve heightened attention in a more comprehensive account of the reception to Rousseau's works in the Swiss republics.[66]

The second approach to the *savant* as a man of his times brings the difficult relations between erudition and politics in the context of the Swiss republics to the fore. The *Discourse on the Arts and Sciences* was no doubt primarily directed against the French *philosophes* and their essential contribution to the Enlightenment, the *Encyclopédie*. At the same time, it questioned some of the major efforts undertaken by Swiss *Men of Letters* in order to preserve their republics from decline. While Rousseau reminded them that he deemed books, academies, and erudite societies to be useless, most of the Swiss insisted that if they were properly used, the arts and sciences would provide an important contribution to the reform of their societies. Iselin counted more on the sciences when he insisted that republican citizens needed to be erudite and enlightened. Bodmer and his disciples considered the arts to be even better suited for instructing common men and making them virtuous. In the face of Bodmer's and Breitinger's seminal contribution to the theory of the fine arts which was further developed by Sulzer, it is rather surprising that Rousseau gained so much admiration as a man and as a writer in the Republic of Zurich. The

[66] At least one important review of the *Second Discourse* that was omitted in this paper ought to be mentioned here. It was written by Emer de Vattel, the famous author of a treatise on the law of nature and nations published in 1758. The review appeared in the *Journal helvétique* (August 1755), 220–228; cf. the resonance of Rousseau and the Philosophes in the correspondence of Albrecht von Haller: Martin Stuber, Stefan Hächler and Hubert Steinke, 'Albrecht von Hallers Korrespondenznetz. Eine Gesamtanalyse', in Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005), 1–216: 153–169.

main reason for this must be that Bodmer and his disciples shared Rousseau's unreserved commitment to republican liberty and perceived him as a close ally in their opposition to the ruling elite. While the *patriots* were obviously convinced that Rousseau's political theory was directly relevant in their own context, Füssli eventually concluded that it would be dangerous to apply an ideal political theory to the existing Swiss republics. This line of argument was later taken up by Haller, who defended aristocracy as the best form of government against Rousseau's doctrine of popular sovereignty. Since Haller was by then a Bernese magistrate, his vigorous opposition against the *Social Contract* is not too surprising. In the context of this essay, it is of greater significance to observe that Haller attempted to fight Rousseau with his own weapons when he blamed him for belonging to the sect of philosophers and orators who sell falsehood as truth and corrupt their compatriots' virtue. It is yet another question whether Haller was able to convince his readers that the elitist notion of knowledge and enlightenment that he defended in his novel was still appropriate in his own time.

VOLUME TWO

PART FOUR

PRINTING AND COMMUNICATING:
THE PRESENTATION AND DIFFUSION OF KNOWLEDGE

MEN OF EXCHANGE: CREATION AND CIRCULATION OF KNOWLEDGE IN THE SWISS REPUBLICS OF THE EIGHTEENTH CENTURY

Simona Boscani Leoni

Over the past decades, the study of communicative processes in the *Respublica litteraria* of the Modern Age has played an increasingly crucial role for research into the history of science, and for the transfer of knowledge more generally. Turning their attention to the phenomenon, researchers have pinpointed the role of learned correspondence as an instrument of socialisation across borders and religious beliefs, as a means of exchange for knowledge and ideas, but also as a vehicle for communicating and sharing values. More especially, by exchanging letters scholars were able to assure a regular transfer of information and collectibles (i.e. not merely publications, but also plant seeds, dried flowers, stuffed animals, and even animal organs that might serve medical testing), a faster transfer—and at times even less formal—than was afforded by the new media (reviews, periodical publications, etc.), which were just taking off around the seventeenth and the eighteenth century. By analysing a scholar's epistolary network we are likely to come across what Robert A. Hatch has defined "science in the making", that is the development of a new idea, of a new scientific interpretation, or even the complex process of drafting a text.[1]

[1] Robert A. Hatch, 'Correspondence Networks', in Wilbur Applebaum (ed.), *Encyclopedia of the Scientific Revolution: from Copernicus to Newton* (New York 2000), 168–170. On the *respublica litteraria*, e.g. Hans Bots and Françoise Waquet (eds.), *Commercium Litterarium. Forms of Communication in the Republic of Letters, 1600–1750* (Amsterdam and Maarsen 1994); Anne Goldgar, *Impolite Learning. Conduct and Community in the Republic of Letters, 1680–1750* (New Haven and London 1995); Robert Vellusig, *Schriftliche Gespräche. Briefkultur im 18. Jahrhundert* (Wien 2000); Jürgen Fohrmann (ed.), *Gelehrte Kommunikation. Wissenschaft und Medium zwischen dem 16. und 20. Jahrhundert* (Wien 2005); Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005); Peter Burke, *A Social History of the Knowledge: from Gutenberg to Diderot* (Cambridge and Oxford 2000); Klaus-Dieter Herbst and Stefan Kratochwil (eds.), *Kommunikation in der Frühen Neuzeit* (Frankfurt/M., Berlin and Bern 2009); Ivano Dal Prete, Maria Teresa Monti and Dario Generali (eds.), *Le reti in rete. Per l'inventario e l'edizione dell'Archivio Vallisneri* (Firenze 2010). An interesting example of analysis of a learned network: Laurence Brockliss, *Calvet's Web. Enlightenment and the Republic of Letters in Eighteenth Century France* (Oxford 2002). Recently: René Sigrist, 'La République des sciences: essai d'analyse sémantique', *Dix-huitième siècle* 40 (2008),

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My contribution will focus on scholars as "producers of knowledge", on their systematic accumulation of learning and strategies of communication. The Swiss doctor and naturalist Johann Jakob Scheuchzer (1672–1733) is a case in point. My aim is to present some general thoughts on data collection strategies but also on the relationship between scientific documents and the role of epistolary communication, which turns out to be instrumental in the study of natural history in the modern age.[2] The paper is structured in three parts. The first presents an outline of the figure of Scheuchzer as a member of the Republic of Letters of the time and his epistolary network. Part two examines the function of questionnaires in the process of gathering and exchanging information and knowledge. In the third and final part, my analysis will focus on the significance of correspondence in this respect.

Precisely this last point is the core concern of the present article. Here, two elements seem to me to be crucial, and indeed there has been a fresh surge of interest in them over the past few years.[3] To begin with, we notice the role of correspondence with local peripheral elites, geared—in the case of Scheuchzer—to systematic data gathering on Swiss and Alpine natural history. Swiss scholars were invited to respond to a questionnaire devoted to natural history which our Zurich scientist sent to his correspondents in 1699: this mobilisation clearly shows the existence of a sort of "horizon of expectations" which also involved the *peripheral* elites of the old Confederation. From this point of view, the interest in collecting observations on natural history was an ideal that spread not only across the educated urban elites, but which overlapped with a patriotic mission of promoting knowledge of one's homeland. Such channels through which

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333–357. On the role of correspondence in the field of botany, see Regina Dauser et al. (eds.), *Wissen im Netz. Botanik und Pflanzentransfer in europäischen Korrespondenznetzen des 18. Jahrhunderts* (Berlin 2008), in particular, the introductory articles by Hans Bots, 'Exchange of Letters and Channels of Communication. The Epistolary Networks in the European Republic of Letters', 31–45, and Emma C. Spary, 'Botanical Networks revisited', 47–64.

[2] On the study of natural sciences in the modern age, see for instance Katharine Park and Lorraine Daston (eds.), *The Cambridge History of Science*, vol. 3: *Early Modern Science* (Cambridge 2006); Roy Porter (ed.), *The Cambridge History of Science*, vol. 4: *Eighteenth-Century Science* (Cambridge 2003); cf. Lorraine Daston, *Wunder, Beweise, und Tatsachen. Zur Geschichte der Rationalität* (Frankfurt/M. 2001); Nicholas Jardine (ed.), *Cultures of Natural History* (Cambridge 1996); on the Renaissance, see Brian W. Ogilvie, *The Science of Describing. Natural History in Renaissance Europe* (Chicago 2006).

[3] This is the path followed by, for instance, Alix Cooper, *Inventing the Indigenous: Local Knowledge and Natural History in Early Modern Europe* (Cambridge 2007), and, in the context of historical and antiquarian studies in England, the study by Daniel Woolf, *The Social Circulation of the Past* (Oxford 2003).

local observations and knowledge were collected and exchanged proved essential for the development of naturalist research. In the specific case of Scheuchzer, the constant mingling of the epistolary testimony with the printed texts, in the form of frequent direct quotations from letters, is indeed proof that there was total trust between the naturalist and his informers; but it also confirms the use of a method based on compilation, built on the simultaneous presence of literary and erudite references, of passages copied from letters, and personal observations.[4] Items of information received from his correspondents went to make up thematic chapters, devoted to the description of diverse phenomena or of different fields of study (from the animal kingdom to the vegetable and mineral kingdoms) and which contained practical illustrations, in addition to a series of observations and data detailed serially. It was this particular approach of combining compilation with description that enabled our Zurich scientist to contextualise the observations received from his correspondents and so to produce an original, logical and organised corpus of naturalist knowledge.[5] Within this compilatory strategy, noticeably Scheuchzer uses several rhetorical devices in order to insert his epistolary testimonies into the volumes he put into print: at times he gives accurate details of his sources, at other times he underlines generically the reliable quality of his writer-correspondent, without mentioning him by name; or again—though rarely—he tinkers a little with his source document to make it more "neutral", more "rigorously scientific". For Scheuchzer, the epistolary source, already used by other natural scientists before him, from Conrad Gessner (1516–1565) to Athanasius Kircher (1602–1680) and Johann Jakob Wagner (1641–1695), is invested with the quality of testimony and authentication that is as fundamental as that of information sources in print. In addition it was something that he could hardly avoid if he wanted to study a territory, the old Swiss Confederation, which at the time was still uncharted territory for naturalists.

The significance that Scheuchzer attributed to local witnesses reveals another essential aspect which, to my mind, remains largely ignored. I am

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[4] On the subject, see for example Franz Mauelshagen, 'Netzwerke des Vertrauens. Gelehrtenkorrespondenzen und wissenschaftlicher Austausch in der Frühen Neuzeit', in Ute Frevert (ed.), *Vertrauen. Historische Annäherungen* (Göttingen 2003), 119–151.

[5] Further reflections on this subject in Paola Giacomoni, 'La teologia naturale di Johann Jakob Scheuchzer', in Simona Boscani Leoni (ed.), *Wissenschaft—Berge—Ideologien. Johann Jakob Scheuchzer (1672–1733) und die frühneuzeitliche Naturforschung/Scienza—montagna—ideologie. Johann Jakob Scheuchzer (1672–1733) e la ricerca naturalistica in epoca moderna* (Basel 2010), 37–56 and Giuseppe Olmi, *L'inventario del mondo. Catalogazione della natura e luoghi del sapere nella prima età moderna* (Bologna 1992).

referring to the role of so-called minor figures, or simply "curious" members of the educated class, who kept up a steady stream of correspondence with "high-ranking" scholars (who, like Scheuchzer, could have access to major European academies). More importantly, however, these same people acted as intermediaries, transferring evidence gathered from more ordinary people, shepherds, peasants, etc.[6] This consideration flags up two elements that are central to the Scheuchzerian work and—more generally—to the development of the study of natural sciences after the Renaissance. On the one hand, there is a call, or plea, typical to modern science, from Francis Bacon (1561–1626) to Galileo Galilei (1564–1642) and Descartes (1596–1650) to emphasize the importance of observing phenomena empirically and without preconceived ideas. In this sense, the testimony provided by people involved in "practical" activities was held to be more credible and reliable than that of intellectuals, who were often too dependent on written-down knowledge and less on in-the-field experimentation.[7] On the other hand, this "democratisation" of learning perfectly reflects the idealisation of ordinary people which Scheuchzer puts forward in the figure of *homo alpinus*: the simplicity of his life and habits and of his inborn love for "freedom" and "democracy". Through this idealised figure, Scheuchzer offers a model of pan-Helvetic identification likely to be appreciated across (and regardless of) language and religious boundaries.[8]

A European Intellectual

Scheuchzer is known above all for his leading role in the history of geology, palaeontology, and for his pioneering contribution to the advance-

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[6] On the concept of the relation between centre and periphery and between "major" and "minor" scholars, see René Sigrist, 'Correspondances scientifiques du 18e siècle', *Schweizerische Zeitschrift für Geschichte* 58 (2008), 147–177: especially 163ff.

[7] Cf. Anthony Grafton, *New Worlds, Ancient Texts. The Power of Tradition and the Shock of Discovery* (Cambridge and London 1992), 3.

[8] *Homo alpinus* was an anthropological model developed by Scheuchzer on the basis of his observations of the simple lifestyle of shepherds and alpine farmers. This "model" was to re-emerge and be celebrated (hence acquiring a European dimension) by Albrecht von Haller (1708–1777) in his poem *Die Alpen* (dated by Haller 1729, and published within *Versuch Schweizerischer Gedichten* in Bern 1732). The myth would again be revived in *La Nouvelle Héloïse* (Amsterdam 1761) of Jean-Jacques Rousseau (1712–1778). On Scheuchzer's *homo alpinus*, see Thomas Maissen, 'Die Bedeutung der Alpen für die Schweizergeschichte von Albrecht von Bonstetten (ca. 1442/43–1504/05) bis Johann Jakob Scheuchzer (1672–1733)' and Guy P. Marchal, 'Johann Jakob Scheuchzer und der schweizerische "Alpenstaatsmythos" ', both in Boscani Leoni 2010 (note 5), 161–178 and 179–194.

ment of naturalistic science and climatology in Switzerland and in the Alps.[9]

He was born in Zurich in 1672 into a family of the local bourgeoisie. He studied medicine and natural sciences (mathematics, physics, and astronomy) in Germany (Altdorf, near Nuremberg) and Holland (Utrecht). His interests, however, encompassed broader fields of knowledge, from history to geography, to numismatics. Having completed his academic studies, he returned to Zurich, where in 1695 he was appointed chief medical officer of the Foundling Hospital; some years later he was appointed professor of mathematics in the city's most prestigious college, the *Carolinum*, which trained theologians to enter the Reformed Church. A very dynamic curator of the Bürgerbibliothek and of the Kunstkammer, as well as an actuary of one of the early pre-Enlightenment societies of the city, *Collegium der Wohlgesinnten*, Scheuchzer was also a member of the most distinguished academies of science of his time, including the Royal Society.[10] A matter of months before his death, he was appointed Physics professor in the Carolinum, a great distinction for it was the top chair for the teaching of natural history in Zurich, as well as the rank of senior town physician. Scheuchzer's slow career progress, notwithstanding the esteem and renown he enjoyed abroad, may be explained by his difficult relationship with the political and religious authorities of the town. In particular, his adherence to Copernican theories placed him in an awkward position, as this school of thought was seen as heretical at the time by the most conservative members of the Lutheran Church who held sway over the religious and cultural life of Zurich.[11] Since 1675, the old Confederation had been dominated by a new reformed faith, staunchly orthodox, which required a declaration of acceptance by anyone wishing to practise as professor or minister. The so-called *Formula consensus* claimed—inter alia—divine inspiration for every word of the Hebrew Bible, the salvific power of Christ's death only for the *chosen*, denying the universality of God's grace. Zwingli's reformed Church exercised a tight grip on the cultural

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[9] For a comprehensive overview of his publications and activity, please see part one of the volume Boscani Leoni 2010 (note 5).

[10] On *Collegium der Wohlgesinnten* and other semi-secret societies in Zurich, see Michael Kempe and Thomas Maissen, *Die Collegia der Insulaner, Vertraulichen und Wohlgesinnten in Zürich, 1679–1709* (Zürich 2002).

[11] Rudolf Steiger, *Johann Jakob Scheuchzer (1672–1733). I. Werdezeit (bis 1699)* (Zürich 1927); Hans Fischer, 'Johann Jakob Scheuchzer (2. August 1672–23. Juni 1733). Naturforscher und Arzt', *Neujahrsblatt der Naturforschenden Gesellschaft in Zürich* 175 (1973), 3–168; Michael Kempe, 'Johann Jakob Scheuchzer', in *Neue Deutsche Biographie* (Berlin 2005), vol. 22, 711ff.

life of the city through the censorship institute to which was submitted every text or document that went to press *in loco*. Scheuchzer himself was repeatedly confronted with this problem, especially while he was putting together his commentary to the Book of Job, published—after several revisions demanded by censors—in 1721.[12]

Scheuchzer's popularity as an intellectual seems to have revived in the past decade, both on account of his role as leading spokesman in the geological debate of the early eighteenth century and as a representative of physico-theology, a philosophical-theological school of thought intent on proving God's existence through the study of nature.[13] Reflected in a number of research projects in progress,[14] this renewed interest is an acknowledgement of the depth and relevance of his work, while 90 per cent of its *corpus* remains to be discovered. In addition to a publication record of over 150 books and scientific articles, our scholar has also left us a huge manuscript corpus: about 200 unpublished works and fifty volumes of correspondence, comprising some 7,000 letters from 800 correspondents scattered around Europe. All of these papers are preserved at the Zentralbibliothek in Zurich.[15] Half of Scheuchzer's epistolary network consisted

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[12] Johann Jakob Scheuchzer, *Jobi physica sacra, oder Hiobs Natur-Wissenschaft verglichen mit der heutigen* (Zürich 1721); on these issues, see Irmgard Müsch, *Geheiligte Naturwissenschaften. Die Kupfer-Bibel des Johann Jakob Scheuchzer* (Göttingen 2000), 16–36 (for more on Zurich's cultural and religious context around 1700) 41–44, (for more on the difficulties with censorship authorities) 183ff. (Protocol of the Board of Censors of 21 September 1726). For an overview of Zurich's cultural background in the modern age, see Kempe and Maissen 2002 (note 10), 16–30; Niklaus Flüeler and Marianne Flüeler-Grauwiler (eds.), *Geschichte des Kantons Zürich*, vol. 2: *Frühe Neuzeit—16. bis 18. Jahrhundert* (Zürich 1996).

[13] Worth mentioning: Michael Kempe's studies, in particular his PhD thesis: Michael Kempe, *Wissenschaft, Theologie, Aufklärung. Johann Jakob Scheuchzer (1672–1733) und die Sintfluttheorie* (Epfendorf 2003); as well as other PhD theses, namely Müsch 2000 (note 12) and Robert Felfe, *Naturgeschichte als kunstvolle Synthese. Physikotheologie und Bildpraxis bei Johann Jakob Scheuchzer* (Berlin 2003).

[14] I am referring to the research project funded by the Swiss National Science Foundation (SNSF): *History of Science and History of Knowledge in Dialogue: Common Grounds in the Work of Johann Jakob Wagner (1641–1695) and Johann Jakob Scheuchzer (1672–1733)*, based at the University of Basle (head of project: Prof. Dr. Kaspar von Greyerz) and to the project *Helvetic Networks. Science and Politics in the Correspondence of Johann Jakob Scheuchzer (1672–1733)* which expects to publish a partial edition of the correspondence and to set up a database accessible online. The project is coordinated by the author of this paper at Università della Svizzera italiana and is funded by the Swiss National Science Foundation and the Institut für Kulturforschung Graubünden (Chur). See Simona Boscani Leoni, 'Il progetto Helvetic Networks e la creazione di un repertorio on line della corrispondenza di Johann Jakob Scheuchzer', in Dal Prete, Monti and Generali 2010 (note 1), 1–22.

[15] Cf. Rudolf Steiger, *Verzeichnis des wissenschaftlichen Nachlasses von Johann Jakob Scheuchzer* (Zürich 1933), 3–46.

of *national* contacts, while some 180 correspondents resided in what is now Germany, and some 60 lived in France and Italy; there were fewer contacts with England (about 20 people) and the Netherlands (about 16 correspondents).[16] Scheuchzer's correspondents included mostly doctors, naturalists, and university professors, the most renowned being the philosopher Gottfried W. Leibniz (1646–1716), Antonio Vallisneri (1661–1730), Luigi Ferdinando Marsili (1658–1730), Lucas Schröck (1646–1730), John Woodward (1665–1728), Thomas of Woolhouse, court ophthalmologist in Paris (1661–1730), Abbot Bignon (1662–1743), several members of the Bernoulli family (all mathematicians) in Basle, and many other contacts with the fellows of the Royal Society, London, in particular Isaac Newton (1642–1727), (see tab. 1 and 2). Locally, in Switzerland, the key role was more often played by men of the Church (parish priests, ministers of the reformed Church).[17]

The numerous writings (books and scientific articles) which Scheuchzer put into print during his life are evidence of his tireless activity of researcher into natural history and palaeontology, climatology, medicine, and history.[18] He was a skilled populariser, fired by the belief that naturalistic research was close to a patriotic duty necessarily involving different social classes, which emerges also from his work as a "journalist". Scheuchzer edited several periodical publications, such as *Nova literaria helvetica*, which—after the fashion of similar European publications—contained different types of

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[16] Other correspondents were located in Scandinavian countries, in Russia, and Poland. Scheuchzer's legacy comprises 5,150 letters addressed to him and copies (complete or in parts) of a further 1,800 letters that he mailed to correspondents all over Europe. Unfortunately, there is as yet no full inventory of the correspondence from which to build a numerically accurate picture of his contacts. Cf. Steiger 1933 (note 15) and Simona Boscani Leoni, 'Johann Jakob Scheuchzer und sein Netz. Akteure und Formen der Kommunikation', in Herbst and Kratochwil 2009 (note 1), 47–67.

[17] Analogous examples are to be found in the epistolary network of the Oekonomische Gesellschaft, Bern and environs, cf. Regula Wyss and Gerrendina Gerber-Visser, 'Formen der Generierung und Verbreitung nützlichen Wissens. Pfarrherren als lokale Mitarbeiter der Oekonomischen Gesellschaft Bern', in André Holenstein et al. (eds.), *Nützliche Wissenschaft und Ökonomie im Ancien Régime. Akteure, Themen, Kommunikationsformen* (Heidelberg 2007), 41–64.

[18] His best-known works include: Johann Jakob Scheuchzer, *Οὐρεσιφοίτης Helveticus sive Itinera per Helvetiae alpinas regiones facta annis 1702–1707, 1709–1711* (Lugduni Batavorum 1723); id., *Der Natur-Histori des Schweitzerlands* (Zürich 1716–1718), vols. 1–3; id., *Physica sacra* (Augustae Vindelicorum & Ulmae, 1731–1735), 4 vols. About Scheuchzer's research on natural history, see Simona Boscani Leoni, 'Zwischen Gott und Wissenschaft: Johann Jakob Scheuchzer (1672–1733) und die frühneuzeitliche Naturforschung', in Sophie Ruppel and Aline Steinbrecher (eds.), *"Die Natur ist überall bey uns." Mensch und Natur in der Frühen Neuzeit* (Zürich 2009), 183–194.

information and in particular an updated bibliography of works published in the Confederation.[19] This could not be achieved without a network of correspondence across the Confederation from which he could collect all such information.[20] *Beschreibungen der Natur-Geschichten des Schweizerlands*, which came out at weekly intervals between 1706 and 1708, was a regular supplier of news both useful and curious on local natural history. It was designed to inform a middle-class middlebrow readership, with a twofold objective: popularise science and recruit new correspondents to assist him in this undertaking.[21]

For the multifaceted nature of his activity he may be seen as a "great communicator" Europe-wide. He may no less be considered as obligatory staging post for the analysis of the production and transmission of knowledge in the Swiss Confederation between the Baroque and the pre-Enlightenment period.

A Systematic Database: The Questionnaires

If we want to understand how the Scheuchzerian network developed in the outlying regions of the Confederation and the Cantons allied to it, we need to look more closely at the role of *Einladungsbrief zu Erforschung natürlicher Wunderen, so sich im Schweitzerland befinden*, a questionnaire published in Zurich in 1699 both in Latin and German, containing nearly 200 questions on different aspects of Swiss natural history.[22] Encour-

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[19] *Nova literaria helvetica* was published in Zurich between 1702 and 1715. Other examples outside the Confederation and which Scheuchzer was interested in include for instance: *Nova literaria germaniae collecta Hamburgi* (Hamburg 1703–1706); *Nova literaria germaniae aliorumque Europae regnorum collecta Hamburgi* (Leipzig and Frankfurt/M. 1707–1709); and *Nova literaria maris balthici et septentrionis* (Lubecca, Leipzig and Hamburg 1698–1708).

[20] An illustration of the importance of Scheuchzer's network for the regular collection of bibliographic information is provided by Gaudenzio Fasciati, a councillor for Bregaglia, who in December 1720 despatched from Soglio (Grisons) to Scheuchzer in Zurich a 23-page letter with a list of the publications printed in the Grisons and Valtelline in those years (Gaudenzio Fasciati to Johann Jakob Scheuchzer, 15/26.12.1720, ZBZ H 326, 251–274).

[21] On the journalistic activity of our Zurich scholar, see Walter Kurmann, *Presenze italiane nei giornali elvetici del primo Settecento* (Bern 1976), 82–111; Johann Jakob Scheuchzer, *Beschreibung der Natur-Geschichten des Schweitzerlands* (Zürich 1706–1708), vols. 1–3; the subtitle of the publication is: *Seltsamer Naturgeschichten des Schweitzer-Lands wochentlich Erzehlung*. All through his life, Scheuchzer collected copies of ancient documents for his compilation of Swiss history, preserved in manuscript form at the Zentralbibliothek Zürich [ZBZ]: Johann Jakob Scheuchzer, *Diplomata Helvetica*, 18 Voll., ZBZ Ms. K 12–29; id., *Historia Helvetiae*, 29 Voll., ZBZ Ms. H 105–133.

[22] Johann Jakob Scheuchzer, *Einladungs=Brief/zu Erforschung natürlicher Wunderen/so sich im Schweitzer=Land befinden* (Zürich 1699), 2; reprinted in Hansjörg Küster and Ulf

aging the study of natural sciences by means of questionnaires was an important phenomenon in the modern age.[23] The use of questionnaires originated in similar systems of data collection, which spread after the discovery of the Americas and—in the church—after the Council of Trento. The Spanish "Cuestionarios", on the one hand, and pastoral visits, on the other, were both designed to achieve better administrative communication between centres (of the Spanish Empire or of a diocese) and their peripheries. Improved knowledge in geography, natural sciences, politics, and anthropology of a region—through a systematic collection of data—underpinned a more effective organisation and centralisation of the political and religious powers.[24] Designed to promote the development of naturalistic studies in seventeenth-century England the questionnaires show that there was a perceived need to gather information in an orderly and systematic manner. This new urge was brought about by the geographical expansion and the exploration of new fields of knowledge since the Renaissance. Already in his two volumes *Historia naturalis et experimentalis ad condendam philosophiam* (London 1622), published as Part III of his *Instauratio magna*, Bacon pointed out a range of topics, queries ("*topica particularia*" or "*Articuli Inquisitionis*"), intended to define the state of research in the natural sciences and at the same time promote new ones.[25] Bacon's scheme for gathering data is reflected in the early years of activity of the Royal Society: in 1661, sixteen of its members were entrusted with drafting a list of questions addressed to travellers in exotic countries. Thomas Povey himself (1613/14–c. 1705), colonial entrepreneur who held several administrative appointments and a member of this

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Küster (eds.), *Garten und Wildnis. Landschaft im Achtzehnten Jahrhundert* (München 1997), 14–31. There is also a Latin version of the text: *Charta invitatoria, quaestionibus quae historiam Helvetiae naturalem concernunt* (Zürich 1699). Cf. Simona Boscani Leoni, 'La ricerca sulla montagna nel Settecento sotto nuove prospettive: il network anglo-elvetico-alpino', *Histoire des Alpes* 12 (2007), 201–213.

[23] In general, on the natural sciences from the Renaissance, see Ogilvie 2006 (note 2); Nicholas Jardine, James A. Secord and Emma Spary (eds.), *Cultures of Natural History* (Cambridge 1996), Porter 2003 (note 2).

[24] On these issues, in general: Arndt Brendecke et al. (eds.), *Information in der Frühen Neuzeit. Status, Bestände, Strategien* (Münster 2008); on Spanish questionnaires, see id., 'Informing the Council. Central Institutions and Local Knowledge in the Spanish Empire', in Wim Blockmans et al. (eds.), *Empowering Interactions. Political Cultures and the Emergence of the State in Europe 1300–1900* (Aldershot 2009), 235–252.

[25] For example: Michael Hunter, 'Robert Boyle and the Early Royal Society: A Reciprocal Exchange in the Making of Baconian Science', *The British Journal for the History of Science* 40 (2007), 1–23: especially 14–15; id. (ed.), 'Robert Boyle's "Heads" and "Inquiries" ', Robert Boyle Project Occasional Papers, no. 1, 2005 (downloadable in the researchers' area of the Boyle website: URL: www.bbk.ac.uk/boyle [accessed 28.06.2010]).

group, in 1661 sent Edward Digges (1620–1674/75), Colonial Governor of Virginia, a series of questions designed to steer his observations towards interesting and original aspects to be discovered in the Bermuda Islands and in Virginia. It is within the same process that we should read also the volume *General Heads for a Natural History of a Countrey, Great or Small* of Robert Boyle (1627–1691) published in 1666 in *Philosophical Transactions* and reprinted—proof of their interest and success—with other questionnaires of the time in 1692.[26] The essential role of these "queries" (also in the form of a self-contained work) is clearly demonstrated by the large number of publications that followed Boyle's until at least the late 1690s. Worth mentioning are *Queries in Order to the Description of Britannia* published by John Ogilby (1600–1676) in 1673, as well as, some years later, a list of questions compiled by Robert Plot (1640–1696), author of a natural history of Oxfordshire, of Staffordshire, and first curator of the Ashmolean Museum, and the *Parochial Queries* devoted to Wales in 1696 by Edward Lhwyd, naturalist and palaeontologist (c. 1660–1709).[27] In the same year came out *Brief Instructions for Making Observations and Collections, in order to the promotion of Natural History, in all parts of the World* (London 1696) by John Woodward (1665–1728), English naturalist, physician and professor at Gresham College, London, one of Scheuchzer's most assiduous correspondents. Contacts between the two men were very intense, at least from 1701 and till 1726, on account of Scheuchzer's keen interest in the diluvial theory advocated by the English doctor in his *Essay toward a Natural History of the Earth* (1695). The theory focused on the significance

[26] Dominik Collet, *Die Welt in der Stube. Begegnungen mit Aussereuropa in Kunstkammern der Frühen Neuzeit* (Göttingen 2007), 294; Robert Boyle, 'General Heads for a Natural History of a Countrey, Great or Small', *Philosophical Transactions* 1 (1665–1666), 186–189, 315–316 and 330–343; *General Heads for the Natural History of a Country Great or Small: Drawn out for the Use of Travellers and Navigators, Imparted by . . . Robert Boyle . . . to Which Is Added, Other Directions for Navigators, etc. with Particular Observations of the Most Noted Countries in the World; by Another Hand* (London 1692).

[27] John Ogilby, *Queries in Order to the Description of Britannia* (s.l. [London] 1673); Edward Lhwyd, *Parochial Queries in Order to a Geographical Dictionary, A Natural History, &c. of Wales* (s.l. [Oxford?], s.a. [1696]); For Plot: Royal Society Classified Papers, 19, 93 and 94; Robert Plot, *The Natural History of Oxfordshire. Being an Essay towards the Natural History of England* (first edn. Oxford 1677, Chichelet 1972); id., *The Natural History of Staffordshire* (original edn. Oxford 1686, Manchester 1973). Interestingly, the answers to Lhwyd's questionnaire were assembled and published: Rupert H. Morris (ed.), 'Parochialia Being a Summary of Answers to "Parochial Queries"', *Archaeologia Cambrensis*, Supplements, April 1909, April 1910 and April 1911.

of the Flood for the geological history of the Earth, fossils being interpreted as organic residues of plants and animals killed in the cataclysm.[28]

Scheuchzer aimed to continue the study of natural history undertaken by his predecessor in the position of doctor of the city's foundling hospital and curator—as Scheuchzer was to become, too—of the Bürgerbibliothek. Johann Jakob Wagner (1641–1695) was the author of *Historia naturalis Helvetiae curiosa* (Zurich 1680), one of the first in Zurich to propound an empirical research method based on Bacon.[29] The aim of this work was also to prove to any foreign visitor travelling through the Confederation that, despite the ragged landscape, his homeland was not "harsh and wild" [rauh und wild], a godforsaken country, but on the contrary it possessed "so many and so great beauties and such heart-warming gifts of Nature that you would not look for or find anywhere else", as Scheuchzer himself wrote in his questionnaire.[30] The publication represents a crucial stage in the research strategy launched by the Zurich scholar, first because it confirmed the close ties with Britain's scientific circles, and secondly because it generated—especially in the outlying regions—fresh interest in the study of local history and natural history. There was a deliberate need to involve as many inquisitive (curious) people as possible in his project; a requirement expressed in the introductory pages, in which the naturalist appeals not only to the noble and the learned classes, but also

[28] Woodward's book is to be seen against the backcloth of the discussions that had enlivened the second half of the seventeenth century in Britain on how to interpret the history of the Earth in the wake of the great popularity of Thomas Burnet (1635?–1715), *Thelluris theoria sacra* (1681). This work presented the Flood as a moment of upheaval, in which the earth's crust, which had been perfectly smooth and even in pre-diluvial times, was upset by subterranean forces which gave rise to the formation of mountains and hills; these in turn may be interpreted as a token or memory of God's wrath and punishment for the sins of mankind. See John Woodward, *Essay toward a Natural History of the Earth and Terrestrial Bodies, Especially Minerals* (London 1695); Scheuchzer translated this work into Latin: *Specimen geographiae physicae* (Zürich 1704). On the diluvial theory, Scheuchzer and his connections with England, see Kempe 2003 (note 13). For Burnet: *Telluris theoria sacra: orbis nostri originem et mutationes generales, quas aut iam subiit, aut olim subiturus est complectens* (London 1681); the English translation came out some years later: *The Sacred Theory of the Earth* (London 1684); about these problems, see William Poole, *The World Makers. Scientists of the Restoration and the Search for the Origin of the Earth* (Oxford 2010); on the English debate over the origin of mountains, see for example Marjorie Hope Nicolson, *Mountain Gloom and Mountain Glory. The Development of the Aesthetics of the Infinite* (first edn. 1959, Seattle and London 1997).

[29] On Wagner and Scheuchzer, see Kempe and Maissen 2002 (note 10), 176–177 and 310.

[30] "…so viel und große Wunder und herrliche Gaben der Natur sich finden, als man kaum anderstwo wird suchen oder finden können." Küster and Küster 1997 (note 22), 15.

to those who lived in direct contact with nature, fishermen, shepherds, alpine farmers, mountain dwellers:

> Here I appeal to . . . to everybody, also to ordinary people who live close to nature and derive their food from her, whether as fishermen, shepherds, alpine farmers, alpine dwellers, farmers, herbs and roots gatherers, so that all—for their own honour and that of their homeland—may collect diverse facts and information about nature and [naturalistic] observations coming from anywhere, at least those that come into view and do not occur as man-made or unnaturally contrived, and that they communicate them [to me] even unsolicited, provided they care about it as much as I find it useful and convenient.[31]

We must not underestimate the impact of this text on the regions of the old Confederation and allied territories, particularly in the Alpine regions: in the old Free State [Freistaat] of the Three Leagues, between 1698 and the final years of his life Scheuchzer could rely on some thirty contacts (mainly with the local religious and political elites) which—if we look more closely at his works—turn out to be inexhaustible sources of information.[32] The Three Leagues stood in the eastern part of today's Switzerland, on the border between Austria and Italy, and acted as a staunch ally of the Swiss Confederation. Based on a solid local council autonomy and on an oligarchic-republican constitution, their territory stretched beyond what is currently Canton Grisons. Their jurisdiction, in fact, extended to a number of Lombard provinces, including Valtelline and the counties of Bormio and Chiavenna, which Napoleon annexed to the Cisalpine Republic only in 1797.[33]

Correspondence from the Grisons Three Leagues accounted for 20 per cent of Scheuchzer's Swiss correspondence, while Basle (a university canton) came first, with 25 per cent of Swiss contacts, the most substantial

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[31] "Ich will hiemit . . . auch gemeiste Leut, so mit der Natur viel umgehen und durch sie ihre Nahrung suchen, als da sind Fischer, Hirten, Sennen, Einwohner der Alpen, Baursleut, Kräuter-und Wurzengraberen, daß alle zu ihrem und des Vaterlands Lob allerhand Gattungen natürlicher Begebenheiten oder Observationen von allen Orten her zusammensuchen, aufs Wenigste dasjenige, was ihnen ungefähr aufstoßet oder umsonst zukommet, auch umsonst mitteilen, wann es ihnen so lieb als mir angenehm ist." Küster and Küster 1997 (note 22), 15–16.

[32] So far researchers have considered the *Charta invitatoria* as rather inadequate, cf. Fischer 1973 (note 11), 76.

[33] The territory of the Cisalpine Republic, created by Napoleon in 1797, included Lombardy, Emilia-Romagna, and part of Veneto and Tuscany. To find out more about the history of the Three Leagues and subjected areas in the modern age: Verein für Bündner Kulturforschung (ed.), *Handbuch der Bündner Geschichte*, vol. 2: *Frühe Neuzeit* (Chur 2000).

communication axis at home. The chronological evolution of contacts in this region is a clear demonstration of the domino effect produced by the invitation letter [Einladungsbrief/Charta invitatoria, cf. tab. 2].[34] Before its publication our scholar was able to resort to only one contact, the evangelical reformed minister Giacomo Picenino, with whom he had been exchanging letters regularly since 1698. It was to be another few years before the number of the doctor's contacts—also thanks to Picenino's mediation[35]—rose to 15, prominent among them being clergymen and men of learning. These informants often openly referred to the *Charta invitatoria* in their own letters, replying quite articulately, and enclosing sketched of mountain outlines, alpine plants, minerals, crystals or again transcriptions of tales about dragons encountered by shepherds, hunters, and valley dwellers in the Alps. The 1699 questionnaire seems to have acted as a stone dropped into a pond: the circular ripples set off by the impact spread outwards to encompass friends of friends, other hunters and shepherds, in a word the voice of the local community. It is therefore a complex network that grinds into motion: the local correspondents stir into action, looking for new informants and gather unpublished material of natural history and local history. The replies that reach Zurich by mail are funnelled directly into our scholar's works. Scheuchzer would transcribe excerpts of these letters, at times indicating the name of the informant, at other times only his initials, and in other cases still simply forgetting altogether to mention his sources. Thus local data and lore (supplied by the elite, but also by ordinary people) were circulated, by being integrated into publications based on compilation principles, maybe later to be picked up and re-elaborated into different types of texts (e.g. *Itinera alpina* or the *Natur-Histori des Schweitzerlandes*) or again in articles printed in international journals. Applying this compilatory system all

[34] On Scheuchzer's network: Boscani Leoni 2009 (note 16). References to the *charta invitatoria* appear for example in the letters of Johannes Leonhardi to Scheuchzer, 12.12.1699 (ZBZ H 327, 11–12), 8.2.1700 (ZBZ H 327, 30); Rudolf von Rosenroll to Johann Jakob Scheuchzer, 11.2.[1700] (ZBZ H 326, 361–366); Giovanni Donato Marlianico to Johann Jakob Scheuchzer, 21.8.1700 (ZBZ H 327, 99).

[35] The central role played by the minister Picenino is testified in the letter he wrote to Scheuchzer thanking him for sending him many copies of his questionnaire: "Invitatorias tuas accepi, quas Ill.^{mis} Proceribus meis Aliis communicavi. Herculeu[m] tu Hercules aggrederis opus. Faveat conatibus tuis clementissime Clementissimus." [I have received your questionnaires [chartas invitatorias, SBL] which I have passed on to Illustrious and influential fellow noblemen in my neighbourhood. Like Hercules indeed, you have undertaken a 'herculean' feat. May the most merciful Lord look benignly on your efforts.] Giacomo Picenino to Johann Jakob Scheuchzer, 30.10.1699, ZBZ H 326, 101.

data supplied by individual correspondents were sorted and logged into lists of similar data (descriptions and inventories of avalanches, solar eclipses, other particular phenomena, but also straightforward descriptive inventories of hot springs and mineral water spas). Thus separate, isolated items of information would be transformed, by a contextualising process, into new and original knowledge.[36]

Circulating Local Knowledge

Striking examples of this transfer of local information and lore are to be found in the correspondence of four of Scheuchzer's major informants, namely the ministers of the Reformed Church Johannes Leonhardi (1655–1725),[37] Giacomo Picenino (1654–1714),[38] and the members of the aristocracy Rodolfo de Salis-Soglio (1652–1735)[39] and Rudolf von Rosenroll.[40]

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[36] Useful thoughts on the question of transfer of practical knowledge in botany may be found in Martin Stuber, 'Kulturpflanzentransfer im Netz der Oekonomischen Gesellschaft Bern', in Dauser et al. 2008 (note 1), 229–269. More generally on this subject "Kulturtransfer": Hans-Jürgen Lüsebrink, 'Kulturtransfer—methodisches Modell und Anwendungsperspektiven', in Ingeborg Tömmel (ed.), *Europäische Integration als Prozess von Ausgleichung und Differenzierung* (Opladen 2001), 213–226.

[37] Leonhardi was active in the Three Leagues as a reformed church minister but also as a political activist. His political commitment was aimed at strengthening the axis between the reformed churches of his country, with England and Holland, which he had visited on various occasions. In addition, he pursued a tireless activity as a publicist, with translations into English and Dutch, which remains largely unknown. On the figure of Leonhardi, see Erich Wenneker, 'Leonhardi (Linnard), Joahnnes Christian', in *Biographisch-Bibliographisches Kirchenlexikon* (Nordhausen 2001), vol. XIX, col. 887–891; his correspondence is preserved at ZBZ, Ms. H 327. See also Thomas Maissen, ' "Die Gemeinden und das Volck als höchste Gewalt unsers freyen democratischen stands". Die Erneuerung der politischen Sprache in Graubünden um 1700', *Jahrbuch der Historischen Gesellschaft von Graubünden* 131 (2001), 39–84.

[38] Picenino studied theology in Zurich and—once back in his home country—he practised as a church minister at Soglio, Bregaglia. Erich Wenneker, 'Picenino, Giacomo', in *Biographisch-Bibliographisches Kirchenlexikon* (Nordhausen 2003), vol. XXI, col. 1052–1054. His correspondence is stored at ZBZ, Ms. H 326, *passim*.

[39] The de Salis family held important political and legal appointments in Bregaglia, an Italophone valley in the southern Grisons; in the fifteenth century it became one of the leading families in the Bishopric of Chur. Together with the Planta family, the de Salis grew into one of the most influential families in the Three Leagues from the sixteenth century onwards. Rodolfo de Salis-Soglio was Governor-general for Valtelline in 1699–1700. Cf. Peter Conradin von Planta, 'Salis, von', in *Historisches Lexikon der Schweiz* (HLS), version 6 January 2011, URL: http://www.hls-dhs-dss.ch/textes/d/D20157.php. His correspondence is stored at ZBZ, Ms. H 328.

[40] Public records show that the von Rosenroll family had acquired the freedom of the city of Thusis from as early as the sixteenth century; its activities were in the transports and lending sectors. In the eighteenth century the von Rosenroll encouraged the spread of

Leonhardi, von Rosenroll and Salis are among the top ten correspondents of our Zurich doctor altogether: Leonhardi's *corpus* comprises, in fact, over 300 letters (purely in terms of numbers he is the most active correspondent over a 12-year period, from 1699 to 1711). The aristocrat von Rosenroll is—for the significance of his letters—Scheuchzer's fifth biggest correspondent, over a 27-year span (1700–1727). Between 1703 and 1715, Salis exchanged some 130 letters with Zurich, thus standing in ninth place among major correspondents (see tab. 1 and 2).

The first interesting example of this transfer appears in a letter from nobleman Rodolfo de Salis-Soglio, despatched on 12 May 1704 to Zurich. There, at Scheuchzer's request dated 4 May, unfortunately unavailable, the nobleman replied to several questions regarding the names of some mountains of the Engadina valley and the possibility of treating sheep affected by mange by applying the medicinal properties of certain stones. The focus of the letter, however, was the practice in Bregaglia of using plaster to kill mice.[41] The letter, in Italian, read:

> The method of using our white chalk to destroy mice may be described as follows: place a small piece of chalk in the fire, when it has been baked sufficiently, grind it down to a fine powder and then mix it in with a little chestnut flour. Now when the chalk comes in contact with the moisture of the stomach it quickly sets and hardens, thereby killing the mice.[42]

A German version of the passage, without any mention of the source, figures in *Erzehlung seltsamer Natur-Geschichten des Schweitzerlandes*, picked up again in the later version, in a posthumous reprint edited by Johann Georg Sulzer (1746). The reference is inserted into a chapter on the use of chalk, part of a more general entry devoted to Swiss mineral soil (clay) and their virtues for medicinal, household, or also handicraft purposes. Scheuchzer explains its important use for plastering walls, but also to staunch bleeding from wounds: at the end of the chapter, the reader is given a list of places where chalk was available in the old Confederation.

Pietism in the regions. Rudolf von Rosenroll was Vicar for Valtelline and was acted as envoy for the Three Leagues in Zurich in 1717. About de Rosenroll, see Florian Hitz, 'Rosenroll', in *Historisches Lexikon der Schweiz* (HLS), version 12 November 2010, URL: http://www.hls-dhs-dss.ch/textes/d/D21934.php. His correspondence is stored at ZBZ, Ms. H 329.

41 Küster and Küster 1997 (note 22), 30.

42 Rudolf de Salis-Soglio to Johann Jakob Scheuchzer, 12.05.1704: "La maniera di servirsi del n[ost]ro giesso bianco per distruggere li sorci, è q[ue]sta: si metta nel fuoco un pezzetto di d° gesso, è quando è cotto abastanza si pista minutam^te poi si mischia con un puocho di farina di castagne, acciò li sorci lo mangino, ora quando il gesso sente l'humidità del ventricolo subito s'indurisce, et li fa crepare." ZBZ, H 328, 35–36.

On this list, the example of Val Bregaglia is slotted in immediately after the case of Tiefencastel.[43]

The letter written by the nobleman de Salis-Soglio therefore contributes a description of a local use of chalk (a piece of practical and popular knowledge), and the notion is then incorporated by Scheuchzer into more general chapters. These chapters are assembled from a collection of information and facts according to a systematic design, in order not only to provide new forms of erudition on the Confederation, but also to show the wealth of these lands, blessed by God.

The same principles inform *Natur-Geschichten* where the naturalist dwells on the description of various types of snow slides, what causes them, as well as what preventive measures have been put in place in the mountains; here, again, we see a subject to which he devoted ample space in his questionnaire.[44] In this respect, the observations he received from his most loyal contact, the evangelical minister Johannes Leonhardi and from the aristocrat Rudolf von Rosenroll are particularly relevant. Leonhardi's letter is interesting for it confirms the enthusiasm aroused in the local elites by the *Charta invitatoria*. Leonhardi replies to the numerous questions in a 15-page manuscript, devoting special attention to questions nos. 24–29, regarding what causes avalanches, their different typologies, the damage they bring about, means of avoiding them or their degeneration'. Leonhardi tells a story that was reported to him from the village of Tschiertschen, in the Churwalden district, a region situated near the town of Chur, a number of kilometres to the north of the village where Leonhardi resided (Nufenen, in Rheinwald, on the road that climbs up to the alpine passes of Splugen and S. Bernardino). Scheuchzer was interested in this story because it showed empirically how—by creating a thin layer of air—one could survive under the snow of an avalanche:

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[43] "Bey *Soglio* im Bergellerthal, allwo die Einwohner den Gyps zu Vertreibung der Mäusen und Ratten. Nachdem sie den Stein gebrennet, und zu einem subtilen Pulver gestossen, mischen sie dasselbe mit dem Castanien-Mehl; wenn denn die Mäuse kommen, davon zu fressen, und der Gyps in ihren Mägen mit dem dasigen Hebel sich in eine Massam vereinbaret, welche in dem Leibe selbst verhartet, so müssen sie nothwendig davon zu Grunde gehen." *Johann Jakob Scheuchzer, Naturgeschichte des Schweitzerlandes, samt seinen Reisen über die Schweitzerische Gebürge*, ed. by Georg Sulzer (Zürich 1746), 2 vols., I: 412–413. See also Scheuchzer, *Beschreibung* 1706–1708 (note 21). This style Scheuchzer had to provide long lists of places and events is found equally in his research on earthquakes: Monika Gisler, 'Forschen in den "Eingeweiden der Erde". Johann Jakob Scheuchzers Erdbebenforschung zwischen Wissenschaft und Theologie', in Boscani Leoni 2010 (note 5), 73–88.

[44] Küster and Küster 1997 (note 22), 19.

> At this point we cannot help mentioning the story that happened a few years ago in Tschiertschen in the jurisdiction of Churwalden; there two men wanted to take home the milk that was still warm from their *salvo honore* [sic] cows in the basket that they carried on their back and they were run over by an avalanche. The first man's basket overturned and the milk spilled out and poured over his head and neck; it created some room in front of his mouth and nose, allowing him to breathe; so he was pulled out from under the snow alive, and he lived on for years after the event. The second man, whose basket had not overturned, was found dead.[45]

The question of how to survive under an avalanche of fresh snow was discussed by Scheuchzer in a chapter devoted to "Schnee-Lauwen" [On snow slides], with an advanced reference to the Tschiertschen event, and later narrated in detail in the section entitled "Historical account of all the damage caused to this day in the Helvetic lands". Here he was going back to a series of accounts of catastrophes caused by avalanches, in order to prove, I would say scientifically, both the regularity and the dangerous nature of such phenomena, not be interpreted as a "mere figment of one's imagination" [leeres hirn-gedicht]. The repertoire of natural disasters that have marked the history of the Confederation began with the episode of the onslaught in 1478 of the Confederate troops on Ticino's territory, which was still under Milan's rule. It took place on the St. Gotthard Pass. The Confederates were caught up in an avalanche that swept away 60 men. The list of catastrophes ended with contemporary events (namely in 1700).[46] Local informants replaced historical and literary sources, which were largely tapped into for information when drawing up the list of more ancient catastrophes. When dealing with events that had taken place in his lifetime, Scheuchzer makes room for eyewitnesses or hearsay witnesses, especially clergymen with whom he enjoyed an intense exchange of correspondence, as for instance Giacomo Picenino, Johannes Leonhardi

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[45] Johannes Leonhardi to Johann Jakob Scheuchzer, 23.11.1699, ZBZ H 327, 4: "… hierher/ gehört eine geschickt, welche sich vor etliche jahren zu Tschiertschen, im Churwaldergericht begeben; da zwey männer ihrer S[alvo, SBL] H[onore, SBL] kühen warme milch nacher Haus tr[ugen] wolten in rückküblen; (die mann auff den rücken tragen thut) und beide von einer schneelöuwenen eingewicklet wurden; da gienge dem einte der rückkübel auff, und den milch rin[n]ete ihme über den hals und kopff hinab, und machete ihme ein wenig weite vor dem mud [sic] und nasen; den er athem holen möchte; der wurde lebendig außgegraben und hatt noch seithero zimlich lang. Aber der andere, welichem der rückkürbel nicht auffgegangen, wurde tod außgegraben."

[46] The sources mentioned by Scheuchzer are historical sources: Fuesslin, *Chronicon Helveticon*, Msc.; Michael Stettler, *Chronic oder gründliche beschreibung … Nüchtlandischen Chronic*, Lib. VI, 274; Bullinger Lib. IX, Hist. Helv. Msc.; Johann Heinrich Rahn, *Eydgenössische Geschichts-Beschreibung* (Zürich 1630). Scheuchzer 1746 (note 43), I: 303–307.

for Grisons, and Johann Heinrich Tschudi for the Glarus region. Their testimonials were introduced and used in the same way as those that he drew from printed texts. In the case of Leonhardi, Scheuchzer mentions his correspondent's name and the date of the letter, and intervenes only in one place to censor the text of the letter that he transcribed—literally in all other respects—by cutting the phrase *salvo honore* (S.H.) which accompanied "cows" in the original, probably because it added an excessively "moralistic" tone to the text.[47] Our Author's concern for the topic is borne out by two further letters. The first contains a lengthy report by the nobleman von Rosenroll in response to the *Einladungsbrief*, in which he described what one had to do to survive under a snow slide, in particular by creating a hollow space over or around nose and mouth, exactly as was explained by Leonhardi. The second reference is found in Scheuchzer's reply dated February 1700, where he asked for more details on "Staublawinen" [powdery avalanches].[48]

A further example of his curiosity for these issues is presented in volume one of *Natur-Histori* devoted to a description of Swiss orography (1716).[49] In a chapter on mountains and their dangerous nature, Scheuchzer provides a sort of complement to the description of the various kinds of avalanches, of the different systems to escape and reach safety, and to his account of the damage caused by avalanches over the centuries, published in *Natur-Geschichten.* The method is compilatory and consists in integrating, this time "tacitly", data or information drawn from letters. In this case, he transcribes a passage from a letter of the reformed minister Giacomo Picenino, dated 26 December 1705, who in turn was acting as spokesman for villagers who had witnessed the catastrophe covered by the narrative. The passage of the letter reads:

> A little while ago, a large mass of snow fell from a very high mountain over our village, crushing two little girls who were asleep in a little hovel. For

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47 Ibid., 306; Scheuchzer, *Beschreibung* (note 21), 4.11.1705, 155 (Zürich 1706).

48 Rudolf von Rosenroll to Johann Jakob Scheuchzer 11.2.[1700], ZBZ H 326, 361. "vor dem maul die schnee wegmachen, dan wan durch dises mittel, oder sonsten mitlest eines steins, holzes, od eingeworffene gebäwes, ein Hole zu haben, den athem zu schöpfen kan Einer zwey, oder drey tag beym leben erhalten schöpfen kan Einer zwey, oder drey tag beym leben erhalten" [. . . in the event of being buried under a mass of snow, one must, if possible, remove any snow from around the mouth, and so dig out a hollow, by means of a stone, wooden stick, or some device that may have been sent down, so as to be able to breathe, which would enable one to survive for two or three days]. Johann Jakob Scheuchzer to Rudolf von Rosenroll, 23.2.1700, H 150, 146–147.

49 Scheuchzer 1716 (note 18), I: 144–145.

> three days farmers carried out a careful search for the little corpses lying under the snow. The hovel [Hyppocaustum] (this is how it is reported by those who saw) was swept away with great force by the huge volume [of snow] (not fragmented but in one whole piece) hurtling through the wood and down escarpments, till it smashed against them. Nearly everything that was in that unfortunate hovel was found, except for the two little girls, who were still missing then. This happened on Mount Albirum on the night of 21 December, according to the old style [calendar]; should anyone pass on any more information, I will not fail to let you know, most perceptive of observers.[50]

Without even a hint at his source, Scheuchzer picks up the narrative of the clergyman in a quasi-slavish manner:

> On 20/21 December of the year 1705, at night, an avalanche plunged down from Mount Albirum in Bregaglia, not far from Soglio in the Leagues. It smothered two little girls in their sleep; they were in a little hovel, which was swept away by the snow slide and after careering downhill smashed against trees and escarpments; almost everything belonging to the hovel was found, but the two little corpses were recovered only on 26 December.[51]

Once again, local testimony is sound and valuable as it is unmediated, and replaces, at the same level, older testimonies supplied by literature or history books to which our Zurich author impartially and constantly refers.

A third example of such contaminations may be found in a letter from nobleman von Rosenroll who, like Leonhardi, was engaged in the collection of naturalistic material. Since 1700 and following up on the *Einladungsbrief*, he had grown into one of the most regular contacts of our Zurich author. In particular he also sent him the report mentioned earlier, in which he replied painstakingly to at least 40 questions in Scheuchzer's survey.[52] Scheuchzer used von Rosenroll's information in various ways:

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[50] "Nuperrime nivium moles, ab altissimo monte ruens in ditione nostra, duas filiolas in hyppocausto stertentes, suffocavit. Corpuscola, licet per triduum a rusticis nostris diligenter quaesita, adhuc nive obruta jacent. Hyppocaustum (ubi referunt qui spectaculum hocce viderunt) a Mole (haud lacerum, sed integrum) summo cum impetu ad silvam et rupes fuit transportatum: ast in eas incidens fuit disruptum. Fere omnia, quae per infausto huic erant inclusa tuguriolo sunt inventa exceptis defunctarum cadaveribus, quae adhuc desiderantur. Accidit id in Monte (Albirum) sub crepusculum vespertinum die 21 Xbris s[tilus] [vetus] si quid hic rari mihi communicetur, id tibi hujus aliorumque scrutatori sagacissimo, communicabo." Giacomo Picenino to Johann Jakob Scheuchzer, 26.12.1705 st[ilus] v[etus], ZBZ H 326, 159–160.

[51] Scheuchzer 1716 (note 18), I: 145.

[52] Rudolf von Rosenroll to Johann Jakob Scheuchzer 11.2 [1700], H 326, 361–366; Simona Boscani Leoni, 'Tra Zurigo e le Alpi: le "Lettres des Grisons" di Johann Jakob Scheuchzer (1672–1733). Dinamiche della comunicazione erudita all'inizio del Settecento', in Jon

an interesting example may be seen in *Natur-Geschichten*, introduced by a clear pledge of esteem toward his friend, not mentioned by name, but called "Your Excellency, my Lord and Friend". The quotation figures in the chapter which reports the devastating effects of the Foehn wind and heavy rains that battered the Confederations in 1705:

> His Excellency, my Lord and Friend from the Domleschg valley, narrates the following facts: in our area, unusually, all streams have overflowed, so much so that on 21 October[53] [of the Julian calendar, SBL] chiefly the Nolla River, which flows past the village of Thusis, swept away weirs and canals [Wuhren] and river banks, destroying bridges, water pipes, flooding gardens and orchards and filling up with rubble the bed of the Rhein River . . . The Nolla river was making such noise as it flowed past, carrying logs, trees, and dark earth matter mixed up with them . . . and ran downhill in such frightening fashion that neither eye nor ear had ever seen or heard the like for horror.

Scheuchzer goes on to mention the fact that his witness, far from merely recounting the events that he had personally "seen" happen, had collected and recorded what other eyewitnesses had allegedly seen: the river had risen by two fathoms [Klafter] and, out of fear, people living there had fled from their homes, carrying their belongings with them to safety.[54]

This is another case in which local accounts were incorporated, hence placed in context and perspective, into a more general chapter: their inclusion is an acknowledgement of the fact that epistolary testimonies and eyewitness reports played a vital part.

Other examples related to observation of mountains illustrate the intense exchange between Scheuchzer and the British cultural circles close to the Royal Society.[55] The circulation of data based on Woodward's

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Mathieu and Simona Boscani Leoni (eds.), *Die Alpen! Zur europäischen Wahrnehmungsgeschichte seit der Renaissance/Les Alpes! Pour une histoire de la perception européenne depuis la Renaissance* (Bern 2005), 157–171.

[53] The date is expressed not according to the Gregorian Calendar (stilus novus) introduced in 1582, but according to the Julian calendar (stilus vetus), which was often the practice in Reformed countries.

[54] Scheuchzer 1746 (note 43), I: 216–217; Scheuchzer used the text of Rosenroll's letter verbatim: Rudolf von Rosenroll to Johann Jakob Scheuchzer, 26.10.1705, ZBZ H 329, 99–100.

[55] Cf. Michael Kempe, 'Die Anglo-Swiss Connection. Zur Kommunikationskultur der Gelehrtenrepublik in der Frühaufklärung', in Robert Seidel (ed.), *Wissen und Wissensvermittlung im 18. Jahrhundert. Beiträge zur Sozialgeschichte der Naturwissenschaften zur Zeit der Aufklärung* (Heidelberg 2001), 71–91; Simona Boscani Leoni, 'La ricerca sulla montagna nel Settecento sotto nuove prospettive: il network anglo-elvetico-alpino', in *Histoire des Alpes/Geschichte der Alpen* 12 (2007), 201–213.

questionnaire is worth mentioning. Scheuchzer responded to it in a letter dated June 1702. The question formulated by the English physician in *Brief Instructions for Making Observations* (1696) concerning the configuration of mountains and caves, also draws attention to the impact of rainfalls on the erosion of mountains and to the problem "whether their *Tops* be not covered with a *Fog*, or *Mist*; especially *before Rain*".[56] To answer the question, Scheuchzer needs to refer to his correspondents, and use their letters as a starting point for his comments:

> On the question whether before great rains and storms clouds or fogs are not observed arising out of the tops of the highest mountains, I am beholden to mountain dwellers who (alone) can determine the arrival or onset of rains or bad weather. Please accept this time [illegible word] this observation on rain. At Filisur in Rhaetia they have this proverb in Rhaetic language: *Cura ch'il pitz da Stiervi fo chiapi, schi lascha der la fotsch, et piglia il rasti* (this Rhaetic language, in common parlance called 'Romantsch', is a corrupt form of Italian dialect). The proverb means: When the top of Mount Stierwis [Stierva/Stürvis] (two miles to the west of Filisur) is shrouded in fog or cloud, cast aside your scythe, with which one cuts the grass, and pick up the rake, with which one gathers in the corn crops, because the rain is coming.[57]

The quotations are from a letter of the pastor Johann Leonhardi dated February 1700:

> In answer to question 9 of the *charta invitatoria*: here at Nufenen when the mountain (called Cucarnil) that towers over the village is wrapped in fog, or clouds, one may expect rain or bad weather the same evening or on the following day. Indeed I remember that a popular proverb in Filisur warns: "Cura ch'il pitz / da Stiervi fo chiapi, schi lascha dar la fotsch et piglia il rasti", in other words: when the top of Mount Stierwis [Stierva/Stürvis], which stands some three to four hours' walk to the west, is covered or

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[56] John Woodward, *Brief Instructions for Making Observations and Collections, in Order to the Promotion of Natural History, in All Parts of the World* (London 1696), 6. Italics are Woodward's.

[57] Johann Jakob Scheuchzer to John Woodward, 8.6.1702, ZBZ H 150, 116–117. "Ad questionem whether before great rains and storms clouds or fogs are not observed arising out of the tops of the highest mountains, scias, inde certissium alpicolis desinui pluviarum et tempestatum Jndicia. Accipe hâc vice [parola illeggibile] eamque pluviosam observationem. Filisurij in Rhaetia restitas viget Proverbium ~~lingua~~ Rhaetica: Cura ch'il pitz da Stiervi (lingua haec est Rhaetica [Romana vulgò dicta] Italicae coruptae dialectus) fo chiapi, schi lascha der la fotsch, et piglia il rasti. Sensum hic est: Quando cacumen montis Striewis quo duobus circiter miliaribus distat Filisuris versus occasum capitium facit, id est nube veluti pileo cingitur abyt falcem, qua secatur foenum, et accipe Rastrum, instrumentum aliud quo foenum in acervos colligitur: quod instet pluvia". Ibid., 116. On Woodward and Scheuchzer, see Kempe 2003 (note 13).

> hidden behind clouds, you should abandon your scythe and pick up your rake because it will be raining soon.[58]

The same reflections return in *Itinera* of 1708 and in *Natur-Histori* (1716).[59] In *Itinera*, the Latin text reads as follows:

> The issue of early-warning signs for rain I am not going to forget, but will demonstrate it later, with further new observations made by mountain dwellers. At *Filisur* in Raethia one can hear the following proverb: *Cura ch'il pitz da Stiervi fo chiapi, schi lascha dar la fotsch et piglia il rasti*. In Rhaeto-romantsch, which is an Italian dialect, it means: *When the top of Mount Stier-wis,* located two miles to the west of Filisur, is *shrouded in clouds or fog, get rid of your scythe*, which you use to cut the hay, *and pick up your rake* which you use to gather and stack it up, because it is about to rain. In Nufenen, too, a village close to the source of the Rhein, if you notice fog patches or clouds on or around the mountain, you can predict rain.[60]

The observation was to become very popular, and it is recorded even in *Relazioni di alcuni viaggi fatti in diverse parti della Toscana* (1773), by Giovanni Targioni-Tozzetti.[61]

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[58] Johannes Leonhardi to Johann Jakob Scheuchzer, 8.2.1700, ZBZ H 327, 32: "Ad quaest. 9. chartae invit: Wann mann hier zu Nuffenen einene kleinen Nebel, oder wolken, auff einen berg, so grad gegen dem dorff über ligt, und Cucarnil genen[n]et wird, sieht, so hatt mann gemeinlich an des selbigen tags abend, oder am anderen tag einen starke/regen, oder ungewitter zu erwarten—So errinneren ich mich/auch daß zu Fillisur ein gemein Spruch-wort ist: Cura ch'il pitz/da Stiervi fo chiapi, schi lascha dar la fotsch et piglia il rasti. das ist: wann der Spitz zu Stiervis [Stierva/Stürvis] (so 3. oder 4. stund von fillisur, gegen abend ligt) kappen macht; oder mit einem wolklein bedeckt/wird, so lasse die Sägessen fallen, und nim[m]e dem rachen: anzeigende/es volge gemeinlich bald ein regen darauff."

[59] Scheuchzer 1716 (note 18), I: 268: "Von dem Cucarnil-Gebirg ist dieses auch ramarquabel, daß wann bey schönem Wetter ein Nebel-oder Wölklein fast im mitten im Berg sich sehen laßt, das gemeinlich am anderen Tag ein Regen folget." [Mount Cucarnil is remarkable in this, when in fair weather you happen to see some fog or a little cloud halfway up the mountainside, you know that as a rule there will be rain the day after].

[60] Johann Jakob Scheuchzer, *Oyresiphoites Helveticus sive itinera alpina tria* (London 1708), 16–17. "Materia hancce de *Signis Pluviarum* non ante dimitto, quam aliis homogeneis novisque Observationibus ab Alpicolis factis illustravero. *Filisurii* in Rhaetiâ usitatum est Proverbium: *Cura ch'il pitz da Stiervi fo chiapi, schi lascha dar la fotsch et piglia il rasti*. Sensus Linguae Rhaeticae, quae est Italicae Dialectus, hic est: *Quando cacumen montis Sterwis*, qui duo circiter milliaria distat à Filisurio versus occasum, *capitium facit*, id est, nube velut pileo cingitur, *abjice falcem*, quâ secatur foenum, & *accipe rastrum*, instrumentum, quo foenum in acervos colligitur, quod pluvia instet. Ita quoque *Novenae*, qui pagus haud longè distat ab origine Rheni, si conspiciatur nubicula vel nubes in monte *Cucarnil*, praedicunt Incolae pluviam procellosam."

[61] Giovanni Targioni Tozzetti, *Relazioni di alcuni viaggi fatti in diverse parti della Toscana, per osservare le produzioni naturali e gli antichi monumenti di essa* (Firenze 1773), vol. 5, 75.

Another theme attracting a good deal of debate, which was also discussed in *Helvetia curiosa* by Johann Jakob Wagner (Zurich, 1680), was the presence of dragons. It was rumoured that there were a number of them inhabiting the Alps, and Scheuchzer argues the question at length in his *Itinera* (tales of travels in the Alps), providing a detailed description of Swiss dragons, canton by canton, "exactly as I have myself come across found in sources be they manuscript or in print, or as was reported to me".[62] Leonhardi himself reported the accounts of eye witnesses from the area, for instance the account of pastor Bartolomeo Alegro da Ponte (a locality in the jurisdiction of Piuro in Valtelline), through the mediation of the minister of reformed church Peter de Juvalta, at Stuls (near Bergün in Grisons). In his letter sent to Zurich on 12 December 1699, Leonhardi transcribed the account received from Bartolomeo Alegro to the clergyman (which the latter had forwarded to Leonhardi on 29 October 1699) of the encounter the man had with a dragon on the mountain of Foppatsch, in the Alps of Stuls, three years previously. The dragon allegedly had the head of a ginger cat, its paws covered in fish scales, tongue like a serpent's and a forked tail. The shepherd claims that he managed to kill the monster, whose carcass was reportedly eaten up by insects in the space of three days. An animal like that one, asserted Leonhardi, was supposedly seen flying by the inhabitants of the region twenty years earlier in the skies above the mountain of Foppatsch. Our Zurich scholar in *Itinera alpina*, as well as in *Naturgeschichten*, returns to this letter, specifying its source, a letter from the evangelical pastor de Juvalta dated 29 October 1699 (but postdating it, arguably by mistake, to 29 October 1702). Dragons with similar characteristics were, in his opinion, to be found in Georgia and in other European regions: this is borne out in the work of Paolo Giovio (1483–1552).[63]

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[62] "…wie ich dieselbe in gedruckten oder geschriebnen Urkunden gefunden, oder aus Erzehlungen gehört habe." Scheuchzer 1746 (note 43), II: 221. Scheuchzer 1723 (note 18), 378–397. Johann Jakob Wagner, *Historia naturalis Helvetiae curiosa, in VII sectiones compendiose digesta* (Zürich 1680), 245–254.

[63] Scheuchzer 1746 (note 43), II: 235–236 (Journey through the Alps no. 5, 1706; German text); Scheuchzer 1723 (note 18), 393–394 (Latin text), the inventory of dragons in the different regions of the Confederation begins on 37. Johannes Leonhardi to Johann Jakob Scheuchzer, 12.12.1699, ZBZ H 327, 11–12. See: Simona Boscani Leoni, 'Johann Jakob Scheuchzer (1672–1733) et la découverte des Alpes: les "Itinera Alpina"', in Catherine Demeulenaere-Douyère (ed.), *Explorations et voyages scientifiques de l'Antiquité à nos jours* (Paris 2008), 81–100.

Once again, local testimony is sound and valuable: it is direct, unmediated, and, being contextualised in a book with a compilatory structure, it can grow into organic and original knowledge of natural history.

Our last example shows that written correspondence can have a facilitating role for the indefatigable naturalist [fleissiger Natur-Forscher] granting him an accurate observation of phenomena, complementing the classical sources. In the specific case, Scheuchzer turns his attention to periodic springs, i.e. well springs that, legend has it, flow alternately. A similar case had already been reported by Pliny the Younger (61–113) in a letter to his friend Licinio Sura, where he described the spring located not far from Lake Como.[64] Scheuchzer not only returns to Pliny's text in his *Natur-Histori* but also compares it with the story he had been sent by Rodolfo de Salis-Soglio in November 1709 as well as with a report that the same Salis supplied in February 1710. In 1709, Salis wrote:[65]

> As to the well spring near Lake Como, which both Pliny the Younger and Pliny the Elder have written about, for the time being I have little more to add to Your Excellency save the fact that I went to see it for myself two or three years ago, and it is on the left-hand bank of the Lake if you are travelling towards Como, at the foot of a big rocky mountain a gunshot away from the lake. There you will find a House or mansion, and behind it up the mountain side, in a rugged and impervious spot, there is a vineyard, and therein in this tight spot, you find the well spring, as far as I can remember they told me that its water rose and fell at six-hourly intervals, at the top of its flow it spills out of its bed and drains into the Lake quite abundantly, but when it reaches a low point, I do not think that it dries up completely; when I saw it, it was visibly rising and then spilled and drained as above, I was told that like the sea, it is subject to the tide. In some respects, its water is

[64] Scheuchzer 1717 (note 18), II: 125. Plinius Caecilius Secundus, Epistolae/Complete letters, transl. with an introduction and notes by Patrick Gerard Walsh (New York 2006), Lib. IV, Ep. 30.

[65] Scheuchzer 1717 (note 18), II: 126; Rodolfo de Salis-Soglio to Johann Jakob Scheuchzer, 7/18.11.1709 and 3.2.1710, ZBZ H 328, 147 and 159. In 1709, he writes: "Quanto alla fontana del Lago di Como, della quale ne parlano li due Plinj p[er] ora non sò dir'altro à V.S. Ecc.ma se non che due ò tre anni sono io son stato à vederla, è a man sinistra del lago nell'andar à Como al piede d'una gran montagna sassosa un tiro di pistola incor lontana dal lago, ivi vi è una Casa ò sia palazzo e dietro essa sù per la montagna in sito molto erto e scosceso una vigna, in q[ue]sto angusto sito si trova da fontana, à mio ricordo mi dissero che cresceva e calava ogni sei hore, quando ella è nella maggior crescenza sgorga dal suo letto e si scarica nel Lago in buona quantità, mà quando è nel maggior callo, non penso che si asciughi del tutto, quando io la viddi cresceva à vista e poi sgorgò come sopra, à me dissero ch'à somiglianza del mare haveva il suo flusso e riflusso. Per altro l'acqua è chiara e molto buona per essere bevuta, ed io stesso ne bevo la pancia piena. Questa fontana o sia palazzo si chiama la Pliniana, dicendosi che un de' Plini vi haveva fabricato una Casa per una dimora…"

> pure and tastes good, and I myself drink it to my heart's content. This spring, or rather 'mansion', is known as 'Pliniana', as legend has it that one of the Plinys had built himself a House for one of his residences…

Scheuchzer's concern was not simply to expound on the phenomenon by reporting the descriptions provided by the ancient authority (Pliny) and the contemporary one (Salis). He went further: following up on Pliny's account, he inquired into the mechanism of such well springs and their connection with tides. In this way, he was prompting his own contemporaries to undertake more thorough research, including for instance the compilation of a sort of journal to monitor and record the rhythms of sources and the relation between the ebb and flow movements and weather events.[66]

Conclusions

The cases presented in this paper show the importance of Britain's cultural influence for a systematic study of nature in the Swiss Confederation at the beginning of the eighteenth century. Scheuchzer was a central figure in this process as a mediator between different traditions and different languages. The cases also corroborate his ability to collect direct observations, by means of a fairly articulated network of correspondence. The circulation of observations and local knowledge ends up making use of the voices of the humbler classes, shepherds and farmers, turned recorders of experiences and narratives as authentic eyewitnesses. The examples cited not only help us highlight two central elements of the strategies of data collection used by Scheuchzer but also suggest more general reflections on the spread of knowledge in the modern age. To begin with, these testimonials are seen as having an equivalent function to that of printed (literary and historical) sources, which Scheuchzer used when recording past or—also—recent events: empirical testimony conveyed in letters was worth as much as sources in print, and complemented "classical" knowledge (suffice it to think, for example, of Pliny's well-spring in Como). We have pointed out that individual letters may be cited in the same way as literary sources (with explicit reference to author and title of the book, the name of the correspondent and date of the letter), or by emphasizing the sender's respectability or trustworthiness without quoting him explicitly

[66] Scheuchzer 1717 (note 18), II: 127.

(see von Rosenroll's case); or yet again by transcribing whole passages word for word with no indication of the provenance. The latter procedure may suggest an oversight on the part of Scheuchzer, who used to work collecting, with a compilatory method, notes extracted from books and letters (sometimes disregarding where the information came from): but it may equally well mean that the author was reluctant to stuff his text full of quotations of passages that the reader would be unable to check. The end result is printed volumes storing a wealth of remarkable primary and secondary sources, in which all the collected data and observations are arranged according to a clear perspective, fitted into a "serial" framework, in which the reader may enjoy a new form of systematic naturalistic knowledge.

The example of the Swiss doctor points to a mechanism of production and circulation in the modern age which did not merely implement a "centre—periphery" model, where "centre" in this case meant the City of Zurich while periphery meant the regions furthest away from the centre, but assumed a more complex and decentralised geography of knowledge production. Although the input for the promotion of knowledge comes from afar, from England as well as from Zurich (remember the *Einladungsbrief*, the first questionnaire of its kind in Switzerland) we have nonetheless pointed out the existence of an horizon of expectations common to the educated classes (both urban and not). These carried out their own naturalistic studies, integrating into their accounts the observations they had personally witnessed but also any "hearsay" from the common people, shepherds, hunters with whom they were constantly in touch. Local lore is therefore gathered, redrafted, selected, put in perspective and finally transferred into the works of Scheuchzer sent for publication, and his texts meet with international acclaim. The Zurich doctor integrates these data into his publications, exports them to an international circuit, lending them his voice as a scholar welcomed into the most distinguished European academies.

Knowledge transfer, in any case, happened on a bipolar basis and struck off in different directions:[67] the difference lies in the fact that Scheuchzer, an intellectual esteemed in the circles of the *Respublica litteraria*, had

[67] Let us not forget that Scheuchzer, in exchange for observations received, used to send to his interlocutors, on a regular basis, not only books, articles, and the odd object, but also other information he thought might be of interest to them.

access to books and articles in print which he could not have obtained at all without his network of national and international relations.

These examples prompt us to reflect more generally on the existence of channels of knowledge production, still to be discovered, which I believe can help us see with different eyes the role of the intellectual in the modern age. Perhaps there is a new angle from which to understand the role of that intellectual as a producer of knowledge, but also as a big *bricoleur*, a tinkerer of local knowledge. There is a sense that naturalistic research finds fertile and critical soil in the provinces, in regions away from the centre. Thus, we might also put forward a new reading of the phenomenon which turns the usual perspective on its head. The input blown in from the cultural centres was echoed among local elites and not only there: these—in turn—by selecting topics according to their own priorities, and questions they chose to answer, defined and gave shape to the image of natural history which the "great" scholars were subsequently to deliver and distribute on the international market of knowledge.

ILLUSTRIOUS CONNECTIONS: THE PREMISES AND PRACTICES OF KNOWLEDGE TRANSFER BETWEEN SWITZERLAND AND THE ITALIAN PENINSULA

Clorinda Donato

Introduction and Preliminary Reflections on Italian-Swiss Scientific Networks

The study of networks in eighteenth-century knowledge transfer continues to change our thinking about how knowledge is created, grown and moved. Networks have forced scholars to examine the dynamic relationships existing not only between ideas, but just as importantly, between the people and structures that housed and nurtured them and the genres and languages through which their ideas were expressed. Connections between people, places, institutions, ideas and cultures of transfer often defined the future of intellectual pursuit and its aftermath. It is in this spirit that we undertake this consideration of one of the most illustrious connections for a scientist residing in the Italian peninsula in the eighteenth century, that of being able to use, or "drop" the name of Albrecht von Haller in one's communication with others, in the dedication of one's publications or in the preface to one's work. Of even greater value was the appearance of one's name and work among "le grand Haller's" own notes or letters, an event that would assure fame for posterity, which is precisely the case for those Italian scientists who could claim Haller as an illustrious connection. As a working premise, then, this article starts from the present and moves backwards to chart why certain second-tier figures have succeeded in clinging to a place in the annals of history and science, a place from which they continue to advance, be read, and researched, with the likelihood that their own intrinsic value and their contributions might be discovered.

For scientists in Italy, contact with Haller opened up the prospect for precisely this type of future. Indeed, Albrecht von Haller was the most esteemed name of a contemporary scientist among the erudite community in the Italian peninsula in the eighteenth century. While a number of the epistolary exchanges between Albrecht von Haller and Italian scientists have been edited, providing the raw data that comprises their

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exchanges, the reciprocal benefits of these relationships have not been previously investigated. Nor has there been an attempt to assess these exchanges against the backdrop of the similarities and differences between scientific exchange in Italy and Switzerland. The publication of correspondences between Haller and a fellow anatomist such as Giambattista Morgagni in Padua sheds light on the scientific debate in the discrete milieu of Padua's illustrious scientific context, yet it stops short of explaining how this exchange may have proliferated to affect the lives of other persons of letters and science whose career trajectories were affected by the relationship between Morgagni and Haller, for example, and whose ideas were transferred to others who would eventually enter the "flow" of ideas and relations that served to move information and knowledge. Such movement, though somewhat difficult to trace through the complex set of relations that united Italian scientists topographically in the Italian peninsula, offers unique results when properly documented. In the Italian peninsula's polycentric manifestation of *lumières*, not all scientists and men of letters enjoyed as consistently a laudatory reception across urban and provincial centres of learning in Italy as did Albrecht von Haller, which makes him the ideal prism through which to track reception and action. This juncture in Haller studies, with data available on his wide circle of contacts, provides a unique opportunity for examining the social topography, origins, careers, reputations, successes, mentors and protégés of the Italian scientific community at the half way mark of the eighteenth century; and while it also enables us to further understand the pivotal role played by Haller in the scientific imagination of many eighteenth-century Italian intellectuals, studying the delicate interplay and shifting needs and fortunes in each camp reveals a far greater network of interdependence than first imagined.

Such a reassessment is necessary now, for scholarship on intellectual and cultural transfer between the Germanic and Italian worlds of the eighteenth century has made significant strides in recent years, thanks both to a new generation of scholars whose interest lies in tracking the place and movement of Enlightenment reciprocally over the Alps, but thanks, also, to the availability of increasing numbers of sources where this transfer can be charted.[1] Yet the difficulty of reading, understanding and analyzing the Italian Enlightenment continues, due to the limited number of scholars

[1] See Giulia Cantarutti, Stefano Ferrari and Paola Maria Filipp (eds.), *Il Settecento tedesco in Italia. Gli Italiani e l'immagine della cultura tedesca nel XVIII secolo* (Bologna 2001).

who can read primary and secondary sources in both Italian and German in order to properly situate these sources within the Republic of Letters. Today, the circulation of sources to and from any number of centres in a vast network of scholarly production is traceable in correspondences, scholarly journals and reviews, monographs and contemporary translated editions. And while numerous scholars have written monographs and articles documenting the relationship between Albrecht von Haller and the Italian scientific community, that information has been largely unknown in the English and French speaking worlds, for it has appeared primarily in German and Italian publications. Limited to a small group of specialists, then, this evidence has made much headway, even among the likes of historians of geography such as Charles Withers, whose recent and otherwise excellent monograph, *Placing the Enlightenment*, makes erroneous claims about Albrecht von Haller's Italian medical network:

> For the physician and botanist Albrecht von Haller, for example, letter writing was a means to secure his own social position as a professor in Göttingen between 1736 and 1753. While there, Haller established and benefited from a web of correspondence across northern Europe especially, with correspondents in Hanover and in Bern particularly important, but with southern Europe figuring hardly at all. Haller's work with Swiss botanists in Zurich and in Basle on the Swiss flora, the *Enumeratio Methodica Stirpium Helvetiae Indigenarum* (1742), one of many such books on native flora based on local fieldwork and agreed taxonomic principles, depended on correspondence. Haller drew upon others' works in this respect—on the Russian Johann Georg Gmelin's *Flora Siberica*, for example—as part of his plans to establish a botanical garden in Göttingen. Although Haller's botanical network was strong, his medical one was weak, with only one man of science south of the Alps. His letters to the Padua anatomist Giovanni Battista Morgagni were of a different sort: currying personal favor, keeping the Italian abreast of the state of anatomical research in German institutions . . .[2]

Instead, Haller's network of Italian correspondents and the frequency of the exchange between them were far more extensive than Withers had imagined and served a far nobler purpose than that of merely the correspondence of a fan club. Indeed, a study of "the great Haller" and his ongoing epistolary relationship with one of the least understood Enlightenment contexts—that of Italy—serves to instruct us about how the Republic of Letters really became just that, for the movement of

[2] Charles W.J. Withers, *Placing the Enlightenment: Thinking Geographically about the Age of Reason* (Chicago 2001).

information and knowledge from the best known hubs of enlightenment, i.e., London and Paris, to new places where a confluence of information flowing from a variety of sources might suddenly establish new centres from which knowledge moved in new directions.

Latin, Translation, and the Italian-Swiss Network

The *Repertorium zu Albrecht von Hallers Korrespondenz 1724–1777* documents the greatest expansion of Haller's contacts in Italy during the years in which he worked as commissioner [Magistrat] in Bern and Roche starting in 1753. During this period, contacts with Italian scientists in northern and central Italy began and grew. Though scores of Italian doctors and scientists corresponded with Haller and the vast majority of them exchanged no more than two or three letters with him, others, such as Caldani, who replicated many of his experiments, exchanged copious letters with him. The variety of these exchanges is indicative of the existence of secondary and tertiary networks involving Italians. Some of them had migrated outside of Italy due to religious persecution, but they remained in contact with Italian scientists, functioning as conduits for information about and from Haller to other Italians. The vast majority of these letters is written in Latin.[3] Though Haller wrote primarily in French to the rest of his network in the Republic of Letters, the use of Latin with his Italian correspondents marks a divide that leads us to speculate as to why. On the one hand, the use of Latin signals a reverence for Italian tradition and excellence in the arts, letters, and sciences that harks back to the time of Renaissance glory when Italy produced exemplary works in both Italian and Latin, that were imitated throughout Europe. Latin was the first language of the Republic of Letters throughout Europe, and still confered a dignified status on Haller and his interlocutors. It also sets the relationship apart as special, and the privileged relationships between Italian scientists and those of the stature of Haller, who wrote to them in Latin, may have prolonged the use of Latin among Italian scientists far longer than was actually beneficial, creating a false sense, therefore, of community that was expanding, and indeed, as this study shows, there were moments

[3] Urs Boschung et al. (eds.), *Repertorium zu Albrecht von Hallers Korrespondenz 1724–1777* (Basel 2002), 2 vols., I: XXIII. See also David Krebs, 'Latein als Medium wissenschaftlicher Kommunikation bei Albrecht von Haller', in Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel* (Basel 2005), 351–370.

and contexts where Latin was still a viable medium. In retrospect, there is no doubt that the use of Latin was becoming limiting; it would ultimately create a wall between Italy and *l'Europe savant*, rather than a window, as the definition of the *savant* widened to include those who had acquired practical knowledge through their senses and through the experience of work, which was imparted by the premises for restructuring knowledge in the *Encyclopédie*. Though still useful, knowledge of classical languages had been denigrated in favour of more accessible languages. Through Latin, however, Haller could tap the current work of scientific Italy, work which he was uniquely qualified to evaluate, publicize and utilize for his own research, as we will discuss.[4]

The uniqueness of Italy's polycentric Italian scientific culture and its complex modes of knowledge transfer have resulted in overly simplified portrayals of Italy's role in the Republic of Letters, as our example from Withers fully illustrates. It still surprises Italianists to learn that centres as vibrant and vital as Venice, Milan, Rome and Naples are often characterized as Enlightenment "backwaters" or the periphery of Enlightenment creation, transit, and transmission of knowledge; fortunately, recent attention to the creation of knowledge in Grand Tour Italy has succeeded in burying that stereotype.[5] Erudite scholars in each of these centres and many others became important nodes of transfer through their ability to translate from Italian or English source texts into Italian or Latin. These texts then spread out to the rest of Italy and Europe. Let us not forget the scores of Italians throughout the peninsula, minor figures many, who were masters of Latin, still a prominent language of knowledge transfer in the eighteenth century. They were so comfortable in Latin that they could just as easily render texts from English or French into either Italian or Latin. This was a skill that the *philosophes* had lost by the eighteenth century, maintaining only a passive knowledge of Latin. Both Italian and Latin as languages of transmission will be explored in this article as overlooked media of transfer.

Thus in parallel manner to the trajectory of Italian language and literature in the peninsula, Italian science flowered simultaneously in centres from Milan, to Padua, to Bologna, to Genoa, to Florence, to Rome, and to Naples, not to mention the activity that took place in even smaller

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[4] See Luciana Alocco Bianco, 'Latin et langues vivantes dans l'*Encyclopédie*', *Recherches sur Diderot et sur l'Encyclopédie* 20 (1996), 141–147.

[5] See Vincenzo Ferrone, *I profeti dell'illuminismo. Le Metamorphosi della ragione nel tardo Settecento italiano* (Torino 2000).

centres such as Rimini and Pesaro. As Hubert Steinke has pointed out in his monograph *Irritating Experiments: Haller's Concept and the European Controversy on Irritability and Sensibility, 1750–90*, the sheer number of scientific centres of some import in Italy meant that as Haller published his findings, or disseminated them through letters, scientists throughout the peninsula were poised to repeat his experiments, weighing in either positively or negatively regarding the replicability and research promise of his work.[6] Whether they ultimately agreed with Haller or not, the tight network of Italian scientists that was continually in dialogue with Haller or in dialogue among themselves about Haller's work served to keep Haller's visibility as a public scientist high, particularly in view of the limited number of Italian journals that might have served the same purpose. The nature of Italian academy culture provides insight into Haller's reception in Italy, for it focused primarily on experimentation from the inception of academy culture in seventeenth-century Italy. As Martha Ornstein has noted, the first Italian Academy, the Accademia del Cimento, was named for its interest in experimentation as a founding principle of the academy. Indeed, "cimento" means experiment, its name reinforced by its motto "provando e riprovando", or "try and try again".[7] Giovanni Bianchi, an important correspondent of Haller's in Italy, followed a career path that was the embodiment of that motto.

Though there may have been fewer Italian journals and periodicals in circulation during Haller's time, we cannot fail to notice that a systematic study of the literary journals that transferred knowledge from the German speaking regions to Italy has never been systematically conducted, nor has the phenomenon of culture and knowledge transfer between Germany and Italy received its due. Thanks to the promising work of Giulia Cantarutti, we know that much will be gleaned from such a study. From a preliminary examination of the journals *Efemeridi letterarie di Roma* and *Scelta di opuscoli interessanti tradotti da varie lingue (Opuscoli di Milano)*, she determined that the relationship between Italian intellectuals and those living in the German-speaking regions "beyond the Alps" was far more intense that what had originally been thought. Indeed, the *Efemeridi* constitute an important document for charting this form of *transfert*, for the *Efemeridi* was the most important journal for the trans-

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[6] Hubert Steinke, *Irritating Experiments. Haller's Concept and the European Controversy on Irritability and Sensibility, 1750–90* (Amsterdam 2005).

[7] Martha Ornstein, *The Role of Scientific Societies in the Seventeenth Century* (Chicago 1938).

fer of information from the German languages into Italy. Her preliminary investigation into this form of transfer reveals that the dissemination of scientific information far outstripped the transfer of "belles lettres". Thus it was the translation of scientific materials from German into Italian that had the greatest impact. But the opposite is also true, for scientists, such as Francesco Soave, were read and widely known in Germany through translation, underscoring the importance of translation in the dissemination of Italian scientific work in the German countries.[8]

Fortunato Bartolomeo De Felice, Giovanni Bianchi and Albrecht von Haller: Case Studies in Italian-Swiss Transfer

But what was the reciprocal nature of this relationship with Italian scholars and how did it serve the needs of both parties? In order to answer this question I have examined the careers of scientists from two different enlightenment centres in the Italian peninsula to analyze the ways in which their contact with Albrecht von Haller and other scholars and scientists from outside of Italy became a crucial element in their ability to acquire public recognition for their work. These Italian scholars are 1) Fortunato Bartolomeo De Felice, born in Rome in 1723. He worked at the University of Naples, and finished his career in Switzerland where he died in 1789; 2) Giovanni Bianchi, born in 1693 in his hometown of Rimini, where he also died in 1775. A polymath with an impressive network of his own, he worked for a three-year period as professor of Anatomy at the University of Siena, but returned to Rimini, disillusioned by the backwardness of the Sienese university environment.

Taken together, these two case studies offer insights into the strategies employed by Italian savants in their attempt to climb the ladder of academic and social fame. Their stories and agility with the many networks that were available to them provide mirror-image case studies that both support claims made by other scholars about Italy's Enlightenment and serve as models for any number of important men and women of science and letters inhabiting the Italian peninsula in the eighteenth century

[8] Cantarutti refers to the periodicals edited by Carlo Amoretti, Francesco Soave, Giuseppe Marelli and Giuseppe Galeazzi, *Scelta di opuscoli interessanti tradotti da varie lingue coll'aggiunta d'opuscoli nuovi italiani* [1.1775–36.1777] and continued as: *Opusculi scelti sulle scienze e sulle arti tratti dagli atti delle accademie, e dalle altri collezioni filosofiche et letterarie, dalle opere piu recenti inglesi, tedesche, francesi, latine e italiane e da manoscritti originali e inediti* [1.1778–22.1803].

who were significant "actors" in the movement of knowledge and culture. The research of scholars such as Françoise Waquet, Paula Findlen, and Gianna Pomata, to name only a few, has brought scholarly attention to Italy's eighteenth century by debunking the centuries' old bias of France against eighteenth-century Italy (Waquet), demonstrating the networks of artistic, cultural, literary, and scientific transmission taking place throughout grand tour Italy (Findlen) and grounding Italy's eighteenth-century medical and scientific research in the strength of the Galileic tradition as manifest in numerous centres of excellence in seventeenth-century Italy (Pomata).[9] By examining Fortunato Bartolomeo De Felice and Giovanni Bianchi and their relationships with Haller, we may demonstrate the intricate interplay of networks in action. To be sure, the relationship between De Felice and Haller was of a most intense and long lasting nature. It consisted of alternating epistolary and face-to-face contact over a twenty-five year period, punctuated by publishing projects and editions. In the relationship between the two we can chart the vacillation of cultural respect and misgivings at play in the resettlement of De Felice in Switzerland and the changes in sentiment that took place as a function of the kind of service that one friend could provide to the other over time and space.

However, prior to our consideration of their relationship, a few words about the working conditions for scholars and scientists in Italy in the 1750s are in order. It should be noted that both De Felice and Bianchi can be counted among those second-tier scientists and men of letters of whom literally hundreds of profiles fill the pages of Franco Venturi's *Settecento riformatore*, that monumental attempt to interpret the activity of so many scholars in so many places within the Italian peninsula, who were linked in Venturi's view, by a desire for reform.[10] Thanks to his work, we know their names and a number of their accomplishments. What we often do not know is how they worked and the compromises they had to make in order to produce knowledge and disseminate it. As will be seen, De Felice's career depends heavily upon the relationship between Haller and Bianchi. Over time, the triangulation of their relationship will be reconfigured, with new needs and new academic and religious

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[9] See Françoise Waquet, *Le modèle français et l'Italie savante. Conscience de soi et perception de l'autre dans la République des lettres (1660–1750)* (Rome 1989); Paula Findlen, Wendy Wassyng Roworth and Catherine M. Sama (eds.), *Italy's Eighteenth Century. Gender and Culture in the Age of the Grand Tour* (Stanford 2009); and Gianna Pomata and Nancy G. Siraisi (eds.), *Historia. Empiricism and Erudition in Early Modern Europe* (Cambridge 2005).

[10] Franco Venturi, *Settecento riformatore* (Torino 1969–1990), 5 vols.

pressures arising. Time also plays an immense role in the relationships between Haller and the two Italians, De Felice and Bianchi. Indeed, we can speak, as well, of De Felice's role in Haller's career in Haller's later years, when due to a curious turn of events, Haller's legacy would in part depend upon the immortalization of his medical and scientific work in the pages of the *Encyclopédie* d'Yverdon, edited by De Felice. Much like a publicist of today, De Felice understood that it was his job to promote those who had created opportunities for him. He had even planned, with Haller, to publish a medical dictionary that would have appeared under Haller's name.[11]

Knowledge Transfer and Its Challenges for Italian Scientists: Italian-Swiss Experiments with the Periodical Press

The scientific community of the Italian peninsula faced a serious crisis of both agency and identity in the middle of the eighteenth century. While the Italian literary community had become accustomed to waging a losing battle against the *philosophes* who had declared victory for French as the medium best equipped to express, transmit and disseminate the modernity of *lumières*, the scientific community suffered these same consequences later. Indeed, they were caught by surprise when the effects of the fight for linguistic and cultural leadership in Europe began to affect them as well. The careers of the category of second-tier Italian scientists and scholars like De Felice were the most adversely affected by this shift during the years in which they needed to acquire professional status to advance. As students of the great professors at Padua, Bologna, and Naples who included Marcello Malpighi, Andrea Vallisneri, Giambattista Morgagni, Antonio Genovesi, and Giovanni Poleni, to name only a few, they aspired to follow in the footsteps of their intellectual forebears, confident in the reputation upon which their future rested. The faculty at these prestigious centres of scientific activity still belonged to a world dominated by Latin as a scientific lingua franca, one which had facilitated the seamless transfer of information between centres such as Leiden and Padua. At the end of the seventeenth century and the beginning of the eighteenth, an axis of scientific exchange was established between these two centres that would dominate the study of anatomy for over fifty years.

[11] Cf. Erich Hintzsche (ed.), 'A.v. Hallers "Prospectus d'un Dictionnaire Universel de Médecine" [1776]', *Gesnerus* 23 (1966), 48–54.

However, this axis was supplanted by new centres which imposed new rules of linguistic trading and they were embedded in the new languages of science and commerce, i.e., French, and to a lesser extent, English. Thus the French of France's academies and Francophile Frederick the Great's *Académie des Sciences*, and the English of the Royal Society of London reflected the new conditions of scientific exchange. Latin was demonized as decidedly old school in the sciences, in much the same way that Italian was demonized by the French as a language that was ill-equipped to transmit *lumières*. Italian scientists found themselves caught between the old and the new. Pride in Latin as a means to preserve their status as leaders in the Republique of Letters as well as maintain a learned connection with their mentors meant that students both continued to study and to write in Latin, as well as correspond in the idiom. But the need for wider dissemination of scientific discoveries which could be as equally accessible to the barber-surgeon as to academically trained anatomists and surgeons paved the way for hybridity in the presentation of findings, with Latin or a vernacular language being used either alternatively, or in many cases simultaneously, with findings published for a time in multiple idioms. Additionally, watershed discoveries were now being made by self-taught practitioners whose tools and discoveries could not be as ignored, as was the case of Dutchman Antonie van Leeuwenhoek.[12] Thoroughly unschooled in Latin or Greek, Leeuwenhoek nonetheless knew that he should appeal to the authority of the Royal Society of London to whom he sent his observations scribbled in Dutch. Dismissed for a time for conducting observations with the microscope that appeared to defy logic, a delegation of members of the Royal Society ultimately travelled to Leiden to verify his results, which, much to their surprise, there were able to do. From that time on, his letters in Dutch were published in English or Latin by the Royal Society in their journal *Philosophical Transactions*. Indeed, London had become an important point of reference for scientists who were competing to have their work known. The *Philosophical Transactions* now played a critical role as arbiter in the determination of the quality of the work presented and its attribution. In France, the *Journal des Scavans* had acquired a similar status. Italian scientists publishing 1650–1750 fell into two groups, publishing primarily in Italian in the second half of the seventeenth century, and Latin in the first half of the eighteenth. The

[12] See Brian J. Ford, *The Leeuwenhoek Legacy* (Bristol 1991).

abandoning of the vulgate Italian for Latin is tied to the growing importance of the Royal Society as a European judge for quality and a clearing house for the dissemination of scientific writing. In 1667 the secretary of the Cimento Academy, Lorenzo Magalotti (1637–1712), collected the results of experiments conducted by the Academy and published them with the title *Saggi di Naturali esperienza fatti nell' Accademia del Cimento*. As Martha Ornstein has noted, the Accademia del Cimento was the first scientific academy that produced results gleaned through collaborative experimentation. Focused on reproducing experimentally many of Galileo's theories, the Academy would quickly develop a European reputation as a potential example to follow, with the *Saggi*, becoming a model for published findings. In 1668, Magalotti sent a copy of the *Saggi* to the Royal Society for review. With high expectations of the *Saggi* for the fledgling scientific community at large as a model to emulate, the Royal Society assigned the review of the work to Lord Brounckner, who, recognizing the importance of the experiments, had the *Saggi* translated into English:

> In 1731 P. van Musschenbroek translated it into Latin as *Tentamina experimentorum naturalium captorum in Accademia del Cimento*, and this was the Edition which formed, as has been said above, the laboratory manual of the following age. In 1755 the *Saggi* were translated into the French *Collection Académique*.[13]

The respect for Italian academies, their collaborative work, its dissemination through published findings and their subsequent translation established a pattern for the innovation and evolution of scientific work in Italy and the forging of relationships beyond the borders of the Italian peninsula. According to this pattern, the English translation was commissioned for local, British scholars by Lord Brouncker to Richard Waller, one of the few scientists who lent his services to the Society during the term of Brouckner, the first president of the Royal Society presiding during a fifteen-year span, 1662–1677.[14] With no government support, the society "had long relied on its gentlemen amateurs for survival." However, the true goal would eventually become that of combining the efforts of the "working scientists" with those of the noble dilettantes.[15] Joseph Banks would

[13] Ornstein 1938 (note 7), 106.

[14] Richard Waller became secretary of the Royal Society from 1687–1709; he edited the *Philosophical Transactions* 1691–1695, wrote physiological treatises and was translator of the papers of the Accademia di Cimento.

[15] John Gascoigne, *Joseph Banks and the English Enlightenment: Useful Knowledge and Polite Culture* (Cambridge 2003), 69.

succeed in doing that some one hundred years later when he became the Society's president. Under Brouckner, the Royal Society was a collection of "virtuosi" who still practiced science privately in their own cabinets, eager to absorb the lesson of the academicians of Cimento, however, through the Royal Society's disseminating mission. We might wonder about the accuracy of this translation, performed as it was by someone who was not himself an active scientist. However, with the advent of Musschenbroek's translation of the *Saggi* into Latin, a far more important event for the scientific world had taken place. We can be fairly certain that Musschenbroek translated directly from Italian into Latin; he had acquired Italian through study at Leiden where there was a direct link with Italian universities, as discussed earlier. His translated text became a model of scholarly erudition, full of expert notes and commentaries that he, Musschenbroek wrote himself. Within the Italian context, however, the role of Musschenbroek was of even greater importance, for he became a conduit, from Holland, of knowledge transfer between Italy and the scholarly community of Europe. With his translation of the *Saggi* into Latin as late as 1731, Latin is renewed as a language of erudition that in some circles had not yet been supplanted by French. Latin was still the lingua franca of the erudite. In the following decades, indeed, well into the 1760s, Latin would still be favoured for dissemination purposes among the Italian scientific community. Thus, despite illustrious beginnings in Italian, renowned Paduan and Bolognese anatomists such as Antonio Vallisnieri, Marcello Malpighi, and Giambattista Morgagni would acquire European fame among their peers with publications in Latin intended for fellow scientists throughout Europe. However, Latin would prove to be a limiting and outmoded means of communication for enlightenment thinkers who prided themselves on the ability that French afforded them to reach beyond the community of specialists into any number of literate circles that consumed information about the latest books, experiments, and excavations through journals published in French or English post 1750.[16] French was the public face that knowledge transfer had begun to acquire.

By 1750, Italian scientists faced the very real problem of finding ways to facilitate the circulation of their work outside of Italy, combined with the problem of receiving information about the latest discoveries from the rest of Europe. Italian savants confronted ever greater risks and challenges in their quest to launch public scientific careers, and their futures hung in

[16] Stephen Gaukroger, *The Collapse of the Mechanisms and the Rise of Sensibility. Science and the Shaping of Modernity 1680–1760* (Oxford 2011).

the balance. If they were to have careers that garnered them some form of public recognition outside of Italy, they had to succeed in one of three ways: 1) establish new scientific networks through the publication of journals in Latin or Italian, which were their scientific languages; 2) establish relations with illustrious persons from abroad who might facilitate their entry into prestigious academies and/or facilitate the translation of their works into English or French; 3) relocate outside of the Italian peninsula, publishing directly in the language of their new place of residence. In the 1750s and 1760s Italian enlightenment circles dispersed geographically from Milan to Palermo sought to assert the contributions of Italians by entering the fray with any number of periodical publications. The success of these Italian-language periodicals and publications was significant in the German-speaking areas due to traditionally close ties between Italian scientists and those across the Alps. Readership was high in the German scientific community; as Giulia Cantarutti has demonstrated in her work, many German speakers read Italian.

Switzerland was in a unique position to be receptive to the cultivation of scholarly networks with Italian scholars. A rising star in the European constellation thanks to the recent flourishing of the arts and sciences, Switzerland and Swiss intellectuals seemed to succeed in working in a context that suffered far less from the censorship and religious repression that had become more pronounced in the Italian peninsula subsequent to the 1756 death of Benedict XIV, the enlightened Bolognese cardinal who had been largely responsible for establishing the scientific infrastructure of his native city. The following quote from 1768, some ten years after Benedict's death, sums up the admiration felt by the Italian scholarly community toward Switzerland:

> One has to admit that today, Switzerland is the most fertile of all countries when it comes to beautiful minds, as well as the country where erudition is cultivated with the greatest engagement. The Bernoullis, Euler, Haller, Tissot, Bonnet, etc. are from there. The accademies are flourishing. The Economic Society of Bern is active and famous. Journals abound, and soon another one will be launched in Chur. The publishing houses are many, clean, and tireless . . . It would seem that good taste has penetrated farther there than it has in many places in Germany. In short, there are too many elements to judge that, *ceteris paribus*, the Swiss have nothing to envy of any people when it comes to culture and to their desire to better their own land and spirit. Should we not admire such a people?[17]

[17] I would like to thank Stefano Ferrari for having made me aware of this quote from the *Efemeridi* of Florentine essayist Giuseppe Pelli Bencivenni (1729–1808). All translations

The tone of Italian-Swiss affinity that imbues this letter is repeated in the intense correspondences between Swiss and Italian scholars in this period. It also results in the advent of journalistic projects, such as the ones Pelli has cited in his comment. At this juncture both sides had something significant to exchange with each other and had become good partners for sharing scholarly goods and favours within the Republic of Letters. The journals published in Switzerland of interest to an Italian public that Pelli referenced lead us directly to the career of Fortunato Bartolomeo De Felice and the journals he edited from Bern. De Felice's accomplishments in the years he worked in Switzerland and his ability to operate as a mediator between the two cultures offer a salient example of the bi-directional awareness that had begun to flourish. De Felice took the skills acquired in Rome and Naples in the first half of the eighteenth century and applied them in the receptive Swiss context described by Pelli. What De Felice was able to achieve is remarkable in this context. His background warrants a closer look so that the personal and scholarly profile it draws from and its intersection with Swiss and Italian interests may be better understood.[18]

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are mine unless otherwise stated. "Bisogna confessarlo, la Svizzera è oggigiorno il paese più feroce di belli ingegni, e quello ove con maggiore impegno si coltivano le lettere. I Bernoulli, l'Eulero, Haller, Tissot, Bonnet ecc., sono di questo paese. Le accademie vi fioriscono. L'Economica di Berna è attiva, e famosa. I giornali vi sono in abbondanza, e poco fa n'è incominciato uno di nuovo a Coira. Le stamperie sono colà molte, pulite, ed instancabili. La storia vi s'illustra, e sono celebri due opere scritte in tedesco, la prima delle quali è un *Dizionario istorico della Svizzera* del signor Leu borgomastro di Zurigo in più di 20 tomi in 4°, la seconda una *Geografia politica e topografica* del signor Faesi in 4 volumi in 8°, per non dire di altre delle quali danno ragguaglio i giornali. Il buon gusto da varie congetture pare che vi sia penetrato più che in molti luoghi della Germania. In fine troppi riscontri vi sono per giudicare che *ceteris paribus* gli svizzeri non cedono oggi mai a verun popolo in cultura, ed in impegno di migliorare il loro suolo, ed il loro spirito. Ed un popolo tale non dovrà essere ammirato?", Biblioteca Nazionale Centrale Firenze, Ms. NA 1050, G. Pelli Bencivenni, *Efemeridi*, I series, vol. XXI, 182–184. Also available online at URL: http://ferrovia.bncf.firenze.sbn.it/pelli/ (accessed 12.09.2011).

[18] Eugène Maccabez, *F.B. de Félice 1723–1789 et son Encyclopédie. Yverdon 1770–1780 (d'après des documents inédits)* (Bâle 1903); Jean-Daniel Candaux, 'Inventaire de la correspondance active et passive de Fortunato Bartolomeo De Felice', in *Ici et ailleurs: le dix-huitième siècle au present. Mélanges Jacques Proust* (Tokyo 1996), 181–210; Clorinda Donato, 'An Intellectual Exile in the 18th Century: Fortunato Bartolomeo De Felice in Switzerland', *Romance Languages Annual* (1992), 243–247; id., 'Fortunato Bartolomeo De Felice e l'edizione di Yverdon dell'Encyclopédie', *Studi settecenteschi* 16 (1996), 373–396; id., 'Religion et lumières en Italie, 1745–1775: le choix protestant de Fortunato Bartolomeo De Felice', in Jean-Daniel Candaux et al. (eds.), *L'*Encyclopédie *d'Yverdon et sa résonance européenne: contextes—contenus—continuités* (Genève 2005), 89–120; Alain Cernuschi, 'Les Lumières alémaniques dans l'Encyclopédie d'Yverdon', in Michèle Crogiez Labarthe, Sandrine

His trajectory offers an example of how a very small player in the Republic of Letters could position himself in such a way as to have as his journalistic publishing partners none other than Albrecht von Haller and Vincenz von Tscharner in Bern, and in Milan, the most illustrious exponents of the Milanese enlightenment, Alessandro and Pietro Verri as well as Cesare Beccaria, all within a few short years. De Felice was able to rise to the top thanks to his intelligence, his facility with languages—especially his ability to translate from English into Latin and from French into Italian—precisely the two skills that Haller and Tscharner were seeking. From a poor, numerous Roman family, De Felice had benefitted from attending Jesuit schools and from the contacts he established with the best minds of the Jesuit order. He eventually had to take orders himself for economic reasons, becoming a minor friar in the Franciscan Order. Impressed with his intellect, Celestino Galiani invited him to Naples, where he taught experimental physics for three years (1753–1756) under Antonio Genovesi's tutelage. Genovesi taught only in Italian, seeking to modernize the university, yet access to sources was a problem. With De Felice, he planned for the publication of a series of miscellanea to introduce the new methods and thinking to his students. Though only one volume of miscellanea was published, the contents are telling: Maupertuis' *Lettres sur les progrès des sciences*, Descartes' *Discours sur la Méthode*, D'Alembert's *Discours préliminaire* to the *Encyclopédie*, and a curious selection, not from French but from Latin, the *Discorso istorico-critico del chiarissimo Vincenzo Viviani sulla vita e ritrovati del sig. Galileo Galilei*, a choice that was certainly made to remind the Italian students of Galileo, an Italian, originator of the new age of science. However, the most important translation he did was from English into Latin in the form of John Arbuthnot's 1733 *An Essay Concerning the Effect of Air on Human Bodies*.[19] De Felice published this translation in 1753 in Naples, two years before publishing the *Miscellanea*. Although there was no Italian translation of this work in print, De Felice opted to publish this work in Latin, a wise and timely move that would determine his future, for it brought him to the attention of Haller, evoking, as it did, Musschenbroek's own translation of the *Saggi*. Thus De Felice made a

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Battistini and Karl Kürtös (eds.), *Les écrivains suisses alémaniques et la culture francophone au XVIII^e siècle. Actes du colloque de Berne, 24–26 novembre 2004* (Genève 2008), 147–163.

[19] *Clarissimi viri Johannis Arbuthnot… Specimen edfectuum aëris in humano corpore. Quod primum ex anglico idiomate interpretatus est gallico Clar. Boyerus… Mox vero latine reddidit, atque additionibus, auctariisque illustravit, ornavit, auxit P.F. Fortunatus de Felici* (Neapoli 1753), 335.

decision to translate for a broader, more widespread audience when he tackled Arbuthnot, as opposed to translating into Italian for a more local, circumscribed public. His strategy proved viable, for Arbuthnot's seminal text in De Felice's Latin translation linking climate and health was cited by Haller in his *Elements of Physiology*, bringing the Italian scholar to the attention of the great Haller for his erudition and knowledge.[20] It was a text, however, that must have also appealed to Haller's interest in discovering the climatic reasons for which the Swiss might suffer from homesickness when too far away from the Alps, a topic he pursued in the article 'Nostalgie' that he would later write for De Felice's *Encyclopédie d'Yverdon*.[21] It was the translation of Arbuthnot, splendidly translated and authoritatively annotated by De Felice that drew the attention and praise of Albrecht von Haller, praise to which De Felice alludes repeatedly in his correspondences. In a 19 October 1769 letter to Jean Samuel Henri Formey, perpetual secretary to Frederick the Great's *Academie des Sciences*, De Felice places it at the top of the curriculum vita that he sends to Formey to request consideration of his credentials for admittance into the *Accademie des Sciences*: "I have translated the celebrated English doctor Arbuthnot's essay on the effects of air on the human body, and I wrote at least 2/3 of the notes that M. Haller does me the honour of citing continuously in the third volume of his Great Work on Physiology."[22]

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[20] "J'ai traduit l'essai sur les effets de l'air sur le corps humain par Arbuthnot, celebre Medecin anglais, et j'y ai fait pour le moins 2/3 de notes que M. Haller dans son 3e tome de sa Grande Physiologie me fait l'honneur de citer continuellement." De Felice to Formey, 19 November 1769, Collection Varnhagen von Ense Staatsbibliothek zu Berlin. De Felice is referring to Haller's *Elementa physiologiae corporis humani* (Lausanne and Bern 1757–1766), 8 vols.

[21] Albrecht von Haller [H.D.G., Haller's signature in the Yverdon encyclopedia], 'Nostalgie, Maladie du Pays, ou Heimweh', *Encyclopédie ou Dictionnaire Universel des Connaissances Humaines* (Yverdon 1774), vol. 30, 518–520. For a discussion of this article within a larger context of Swiss sensibility, see Laura Saggiorato, 'Le *Journal de Lausanne*: La sensibilité au quotidien, 1786–1798', in Claire Jaquier (ed.), *La Sensibilité dans la Suisse des Lumières. Entre physiologie et morale, une qualité opportuniste* (Genève 2005), 51–134 (for *sensibilité* in the *Encyclopédie* d'Yverdon, see 75–83).

[22] See Haller 1757–1766 (note 20), vol. 3. In this volume dealing with respiration, Haller repeatedly cites De Felice's Latin translation of John Arbuthnot's 1733 *An Essay Concerning the Effects of Air on Human Bodies*. De Felice boasted about these citations, which appear in Book VIII, Respiratio, Section III, Aer. In these notes, De Felice is in the company of the most famous of anatomists, physicists, and botanists, including Malpighi, Musschenbroek, Boerhaave, Boyle, Ruysch, Boscovich, Vallisneri, Leprotti, Lieutaud, Pott and Winslow. It is not surprising that De Felice was proud of being in such illustrious company and that he used these citations as a way to elevate his own status in the Republic of Letters.

Additionally, he had succeeded in leaving Italy and making a trip to the "heretical lands" as anecdote writer Joseph Gorani described the destination of his short-lived "grand tour" in the company of the Countess Panzutti, whom he had helped escape from a convent for the "unhappily wed" where she had been locked away by her husband.[23] De Felice's highly unorthodox travel attracted both ridicule and admiration. Although we do not know where he went or with whom he met, we can easily assume that he spent time in Switzerland and possibly Germany, judging from Gorani's reference to his travel having taken place in areas where the reformed religion was practiced. When the couple ran out of money and had to re-enter Italy, De Felice's risk-taking had suddenly pushed him into the public arena. Indeed, the story was news worthy enough that it was considered worthy of "media coverage" by Joseph Gorani. The attention his flight and re-entry attracted and his personal intellectual and religious crisis forced him to seek asylum elsewhere. He made the drastic decision to leave Italy. De Felice called in all of the favours he could from the most powerful connections he possessed. In that moment he utilized the network he had succeeded in establishing to secure his exit from Italy. Through the Masonic connections between De Felice's mentor and protector in Naples, Raimondo di Sangro, the Prince of San Severo, and Vincenz Bernard von Tscharner, Bernese patrician and political leader, negotiations began for De Felice's exit from Italy. At the same time, Anatomist Giovanni Bianchi from Rimini, former student of the founder of pathological anatomy in Padua, Giambattista Morgagni, accepted to aid De Felice in his desire to leave Italy and reach Bern, where Haller and Tscharner had plans for him. Morgagni also made arrangements with Haller to also receive De Felice for a time as he moved clandestinely, under the pseudonym Matteo Ughi, towards the Alps from Naples. It is precisely in moments such as these that one can see the Republic of Letters at work, moments in which one's career either ascends or descends. However, the arrangement was to some degree reciprocal, for De Felice needed Bern, and Bern needed De Felice. Anxious to raise Bern's cosmopolitan profile by creating both a structure for sociability and a means of establishing a hub for knowledge circulation, Tscharner and Haller saw in De Felice the ideal figure to lead the charge in the establishment of a "caffe" and the journalistic activity that would make it famous. Tscharner provided financial support, while Haller worked closely with

[23] Joseph Gorani, 'Aventures d'un homme célèbre', in id., *Mémoirs secrets et critiques des cours* (Paris 1793), vol. 1, 316–324.

De Felice on the format and distribution plan for the two journals. In a European Republic of Letters that by the 1750s largely communicated in French and English, the bid to establish periodicals in Latin and Italian can only be understood in the particular context of Swiss and Italian sensibilities within the larger sphere of activity. If successful, went the thinking, they would have a captive market, one, it was hoped, that would only expand. By not competing with the French- and English-language periodicals, De Felice and Haller wagered that readers would maintain Latin as a lingua franca of erudition and that Italian might still have enough cachet to attract something of a readership outside of Italy. For Italian enlightenment centres, the addition of a new periodical in Italian was publicized as proof of Italy's entrance into a new era of European sociability. At the moment of launching his periodical *Il Caffe* in Milan in 1764, Pietro Verri references the *Estratto della letteratura europea* as an example of what a member of the Republic of Letters reads in the shop that was the "caffè" and what the effects of this reading might be:

> in this shop, those who want to read will always find papers containing political news . . . in this shop, those who wish to read will find available for their use the *Giornale Enciclopedico* and the *Estratto della Lettteratura Europea* and similar good collections of interesting new work, which will make Europeans more or less out of men who at first were Romans, Florentines, Genoese, or Lombards.[24]

As we have already speculated, it may seem odd that Bern was more interested in establishing journals in Italian and Latin than in French, a language that was cultivated and spoken by the patrician class. It is not at all odd, though, if we consider the promise of virtually no competition and for Haller in particular, an additional means of adding yet another way of communicating with his extensive network of correspondents in Italy, that of the periodical press. Indeed, the journals in question, the *Estratto della letteratura europea* and the *Exerptum totius italicae nec non helveticae literaturae*

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[24] [Pietro Verri], *Il Caffé, ossia brevi e vari discorsi gia distribuiti in fogli periodici* (second edn., Venezia 1766), vol. 1, fol. I,2. The journal was named "Il Caffé" because it operated under the guise of transcribing the conversations, discussions and stories that were recounted in a real eighteenth-century coffee house. Verri posed as Demetrio, a Greek sage with a quick wit who had relocated to Milan. Verri explains in his first editorial the purpose of the coffee house: "in essa bottega chi vuol leggere trova sempre i fogli di novelle politiche . . . in essa bottega chi vuol leggere trova per suo uso il Giornale Enciclopedico e l'Estratto della Letteratura Europea e simili buone raccolte di novelle interessanti, le quali fanno che gli uomini che in prima erano romani, fiorentini, genovesi o lombardi, ora sieno tutti presso a poco europei . . ."

both targeted an Italian and Swiss audience. The *Estratto della letteratura europea* was an Italian-language review of scientific and cultural literature produced outside of Italy, excerpted and reviewed for an Italian market, while the *Exerptum totius italicae nec non helveticae literaturae* brought Italian and Swiss contributions to the European market in Latin, also in the form of excerpts or reviews.[25] As De Felice mentioned in a letter to Bianchi, the British and Dutch markets were targeted for this journal as well, two places where erudition in Latin still had an audience, in science, as we have seen in our discussion of the Royal Society, and in the field of antiquities which many British grand tourists embraced.[26] De Felice specifically asks Bianchi to supply him with material related to antiquities, knowing of Bianchi's reputation among the British in this area.[27] Published in Bern, both reflect the work of Fortunato Bartolomeo De Felice and the organizational contributions of Albrecht von Haller spanning the years 1758 and 1766. Until now, Haller's interest and input into the creation of these journals hasn't been known. These journals have received little attention since they have often been treated as little more than an editorial training round for the Italian refugee De Felice who would later assume the reins of a publishing house in Yverdon-les-Bains where his greatest editorial achievement, the Yverdon *Encyclopédie* would be published between 1770 and 1780. The journals and the encyclopedia are both extraordinary accomplishments for De Felice, an intelligent, but second if not third-tier scholar who was trying to carve out a place for himself in the Republic of Letters. The Latin journal was important for Haller as it provided a venue for Haller's former students and colleagues to publish in a language, Latin, in which they were still reasonably proficient at least as far as reading was concerned. And if their written Latin skills had begun to wane, De Felice was able to attend to the required stylistic fixes, counting,

[25] *Estratto della letteratura europea*, ed. by Fortunato Bartolomeo De Felice (Bern 1758–1762 and Yverdon 1762–1766) and a Latin journal *Excerptum totius Italicae nec non Helveticae literaturae* was published in Bern at the beginning of his stay in Bern.

[26] See Jason M. Kelly, *The Society of Dilettanti. Archaeology and Identity in the British Enlightenment* (New Haven 2009).

[27] See Antonio Montanari, 'Epigrafi e collezioni di antichità al tempo di Iano Planco', *Il Ponte di Rimini*, 3 March 2011, for a discussion of Bianchi's (Planco's) contributions to the study of antiquities and its evolution into the field of archeology. Montanari attributes the first use of the term "archeological" to Bianchi, although he notes that its use in Bianchi's phrase "scritti archeologici" does not yet reflect a scientific discipline. Nonetheless, Bianchi insists in his correspondences that those best suited to the study of antiquities are doctors like himself, hinting at his awareness of the scientific potential of a discipline in the making.

as did most Italian intellectuals with an ecclesiastical background, on an impeccable command of both classical and church Latin. Johann Georg Zimmermann, Haller's former student, author in his own right, and doctor to the King of Hanover, wrote to Tscharner upon the publication of the first issue of the *Excerptum*:

> Your Latin periodical is currently the most pleasant gift that anyone could have given me. It confers honour on both you and M. Felice, and it fulfills all of the expectations that one would have for such a journal. From time to time, it will be my pleasure to supply articles on medicine to this periodical, as long as M. Felice corrects my Latin style. It has been several years since I have written even two lines of Latin and my knowledge of it is no better than that of the youngest of schoolboys. M. Felice will be doing me a most considerable favour in this regard.[28]

He registered his reaction to the *Estratto* in the same letter:

> I don't understand Italian, but I can make it out. It is by that means that I have become an admirer of your Italian journal. It presents a charming variety of material and it is of no surprise to me that you are selling 2000 copies.[29]

Zimmerman's comments about both journals are important, for embedded within them are the seeds of both journals' demise. Not surprisingly, the *Excerptum* was the first to go. The *Excerptum* would close down in 1762, four years after its debut, while the *Estratto* would go on until 1766, thanks to the help that came from publisher Giuseppe Galeazzi in Milan, where it was published during the last few years of its run, embraced as an important medium of scientific dissemination in Italian by two leaders of the Milanese Enlightenment, Pietro Verri and Cesare Beccaria, both of whom recruited for the journal.

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[28] Zimmermann to Tscharner, 26 November 1758, in Enid Stoye, *Vincent Bernard de Tscharner 1728–1778. A Study of Swiss Culture in the Eighteenth Century* (Fribourg 1954), 156. "Votre journal latin est le present le plus agréable qu'on auroit pu me faire. Il fait infiniment honneur a vous et a M. Felice et il repondra a tout ce qu'on pouvoit souhaiter en ce genre. C'est avec le plus grand plaisir que je fournirai de tems en tems des articles de medecine a ce Journal, mais a la condition que M. Felice en corrige le stile. Je n'ay pas ecrit deux lignes de latin depuis plusieurs annees e je ne le scais pas mieux que le plus petit ecolier. M. Felice me rendra par la le service le plus considerable."

[29] Ibid. "Je n'entens pas l'italien, mais je le devine. C'est par ce moyen-la que je suis devenu un des admirateurs de votre Journal italien. Il y regne une variete charmante et je ne suis pas surpris que vous en debitiez 2000 examplaires."

The *Estratto* was truly a joint Swiss and Italian venture, kept alive in its last few years by the Italians, but it, too, ended in 1766.

From Periodicals to Compilations: Italian-Swiss Transfer in the Yverdon *Encyclopédie*

However, the reciprocal relationship between Haller and De Felice was far from over. In 1768 De Felice published a volume of Haller's poems translated into Italian at his Yverdon press; in 1772 he published Haller's *Lettres sur les vérités les plus importantes de la Revelation* as a French translation by Seigneux de Correvon of the original German edition. It sold quickly and a second edition was published. Now established in Yverdon-les-Bains with Bernese funds, De Felice oversaw the publishing house that would produce one of the greatest literary monuments of the eighteenth century in Switzerland: the 58-volume *Encyclopédie* d'Yverdon. But Haller's relationship with De Felice over the Swiss-produced compilation began tempestuously. Angry, as was Charles Bonnet, for the unauthorized use of his name in De Felice's 1769 advertisements for the work, Haller refused to collaborate, and his comments about De Felice during that period were hardly flattering in his correspondences with Bonnet. Yet both Bonnet and Haller would, in the end, support the *Encyclopédie* d'Yverdon, Bonnet, with a favourable commentary of the Swiss compilation based on a twenty-five article comparison that he had conducted between the Paris and Yverdon editions, and Haller, ultimately, in 1772, with his agreement to yield to De Felice's tenacity in soliciting his collaboration and participation as author.

Bonnet and Haller's swift change of heart toward the Swiss encyclopedia headed by an Italian resides in the shared desire to preserve their names in posterity as scientists working within a *Swiss* context and is reflective of the awakening of a national consciousness in the Swiss cantons. By 1770, Switzerland had acquired a reputation in the fields of science, the emerging social sciences, and theology. Suddenly, they realized that this reputation had a national component and should be presented in a national guise. Both Bonnet and Haller understood the impact that the *Encyclopédie* de Paris was having in the Republic of Letters with contents that were automatically categorized as French. Haller was displeased over the use of the articles he had written for the *Encyclopédie*. He discovered that his ideas appeared in a context that was incongruent with his world view, i.e., a French compilation headed by the *philosophes*, whom he had

denounced and decried time and time again in a variety of publication venues. He also discovered the power of the compilation to change the meaning of content as a function of its juxtaposition with other content. In April 1772 he told Bonnet that he had broken all ties with the Paris encyclopedists:

> I have split with the Encyclopedists. They provoked it. These Philosophes don't believe they are bound by any contract. Besides, they wanted to suppress as they saw fit those of my articles that they didn't approve . . . Besides the maxims and style of these *Cacouacs* had become unbearable.[30]

The advent and immediate success of the first few volumes of a compilation identified and defined as Swiss and marketed as a rival to the *Encyclopédie* de Paris caught their attention as a potential vehicle for preserving their names in posterity within their own cultural and religious context. As Hubert Steinke has noted, the importance of both Bonnet and Haller's experiments was a question of the ability to capitalize on a particular direction of research at the moment when the topic was ripe for widespread debate through the previous dissemination of results obtained by others, and local attempts at parallel experimentation throughout Europe had taken place. The *Encyclopédie* de Paris had its circle of French collaborators and the Yverdon edition should likewise have its recognized circle of Swiss collaborators. What better way to acquire greater fame in the Republic of Letters than to be associated with an encyclopedia that was receiving positive reviews as a national compilation? For Haller, whether he had participated or not, the *Encyclopédie* d'Yverdon would always be associated with him, "le grand Haller", for De Felice had dedicated the entire work to him, even in the face of his initial refusal to participate. In the Republic of Letters, careers had both a present and a future dimension. Associating oneself with the right people could mean success in the present and a name for posterity. Indeed, both Bonnet and Haller's reconsideration of the purpose and value of the Yverdon edition of the *Encyclopédie* can be seen as useful to their own agendas. A study of Bonnet's comparative analysis of twenty-five articles culled from the two compilations is indicative.[31] For

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[30] "Me voila detaché des Encyclopedistes; ils l'ont bien voulu. Ces Philosophes ne se croient liés par aucun contrat; ils vouloient d'ailleurs a leur gré suprimer de ces articles ceux qu'ils n'aprouvoient pas. . . . D'ailleurs les manieres et le stile de ces Cacouacs m'etoit insuportable." Haller to Bonnet, 18 April 1772, in Otto Sonntag (ed.), *The Correspondence between Albrecht von Haller and Charles Bonnet* (Bern 1983), 1013–1014.

[31] See Clorinda Donato, 'Charles Bonnet et L'*Encyclopédie*', in Ulla Kölving and Irène Passeron (eds.), *Sciences, musiques, Lumières. Mélanges offerts à Anne-Marie Chouillet* (Ferney-Voltaire 2002), 421–432.

Haller, instead, the future stakes were even higher. By dedicating the *Encyclopédie* d'Yverdon to Haller, De Felice was, in fact, establishing the Swiss parameters for research and scientific development in contrast with French *philosophie*. De Felice often repeated the Swiss mantra of the compatibility of science and revelation in his correspondence, a mantra that came directly from Haller. Hubert Steinke has expressed this scientific world view most succinctly:

> For Haller there was no intermediate level of forces, there were only two clearly separated worlds, the physical, corporeal world to which such forces as gravity and irritability belong and the incorporeal world of the soul and spirits, and only the former was a subject of scientific research.[32]

Haller's view explains the position of the Protestant Enlightenment. God and science are separate, though there is a hierarchy. God created the world which manifests itself as nature. It is our duty to investigate and understand this manifestation, without, however, questioning the separation of its parts. Bonnet's view was related, though in his middle and later years his interests shifted heavily toward metaphysics. While his theories about mind-body relations and the preservation of a corporeal body in the afterlife may strike us as naïve and unscientific, they acquire value when judged in the context of the emerging social sciences of anthropology and psychology, disciplines that can claim a decidedly Swiss origin in the eighteenth century.[33] The next five works Bonnet published reflected his deepening commitment to finding empirical explanations for the laws governing the union of body and soul, culminating in a theological work by 1770.[34]

Bonnet's recognition that the *Encyclopédie* of Paris was a force to be reckoned with is documented in the two surveys he made of its volumes. The second is the most relevant for our purposes. In 1766, once the text volumes of the *Encyclopédie* had been brought to fruition, Bonnet conducted a second survey of the *Encyclopédie* articles, expressing in a letter to his friend Haller disdain for the work and how the world view it projected diverged from the perspective he shared with Haller:

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[32] Steinke 2005 (note 6), 115.

[33] See Fernando Vidal, *Les Sciences de l'âme XVI^e^–XVIII^e^ siècle* (Paris 2006).

[34] *Essai de Psychologie* (1754); *Essai analytique sur les Facultés de l'Ame* (1760); *Consideration sur les Corps organisés* (1762); *Contemplation de la Nature* (1764); *La Paligénésie philosophique* (1769); and *Recherches philosophiques sur les Preuves du Christianisme* (1770).

> I have examined a fairly large number of articles from the recently published volumes of the *Encyclopédie*. I can tell you that I was even less satisfied than I was by the earlier volumes. The extent to which this work is defective is incredible. I am referring to the Metaphysics, Natural History, Physics etc. They have often copied from Books from the last Century, when they should have copied from more modern books. There are considerable omissions. . . . The article *Plant* is unbearable. They were pressured to finish; they relied on other remedies, & the Editors didn't bother to check it themselves or have it checked for them. I suppose that the Applied Arts and Crafts are better; but an unbearably pedantic tone prevails throughout practically the entire work.[35]

The exchange between Bonnet and Haller reveals what was at stake for Swiss scientists and the presence and spread of their ideas in eighteenth-century Europe. Bonnet expressed a pronounced disdain for compilations in his 1769 rejection of De Felice's offer that he participate in the compilation as a recognized Swiss author. He told De Felice that he would be wasting health, time and money on such an enterprise: ". . . I have every reason to believe that such an enormous enterprise would greatly damage your health and your business".[36] Yet both Bonnet and Haller changed their minds radically about the Yverdon enterprise in the 1770s, once the first volumes had begun to appear. Bonnet expressed his approval through his review and comparison of articles in the Paris and Yverdon editions, while Haller would do so in a far more important way—by lending full support to the enterprise in 1772. As far as networks are concerned, the role of De Felice is crucial. Without being a big name or a famous scientist, he played the important role of mediator, which also means creator of media spaces, where discoveries made by others were made public. While Fortunato Bartolomeo De Felice's role as mediator is often touted, it has never been thoroughly queried to understand exactly how it worked. As we study him from the vantage point of the persons to whom he was connected when he took on this role, i.e., Haller and Bianchi, and we explore the experiments,

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[35] "J'ai parcouru un assés bon nombre d'Articles des nouveaux Volumes de *l'Encyclopédie*. Je puis vous dire que j'en ai encore été moins satisfait que des premiers. Il n'est pas croyable combien ce travail est défectueux. Je parle de morceaux de Métaphysique, d'Histoire Naturelle, de Physique &c. Ils ont souvent puisé dans des Livres du Siècle passé, ce qu'il falloit puiser dans des Ouvrages plus modernes. Il y a des omissions considerables. . . . L'article *Plante* est insuportable. Ils étoient pressés de finir; ils ont eu recours à des manœuvres, & les Architectes ne se sont pas donnés la peine de revoir ou de faire revoir. Je suppose que les *Arts & métiers* sont mieux; mais c'est presque partout un ton de Dissertation insuportable." Sonntag 1983 (note 30), 494.

[36] ". . . j'ai tout lieu de présumer qu'une si grande entreprise ne nuise beaucoup à votre santé et à vos affaires". Bonnet to De Felice, 25 March 1769, in Jean-Pierre Perret, *Les imprimeries d'Yverdon au XVII^e^ et au XVIII^e^ Siècle* (Genève and Paris 1981), 214.

letters, and publications that connected them, we discover how networks brought them together, i.e., the "flow" of energy toward him, and out again through the dissemination of information to other sites that he accomplished through his projects. Indeed, in the study of this particular erudite network, much can be understood about the transfer of knowledge and the making of careers in the Republic of Letters. De Felice had the ability to establish centres of interest through journalistic and encyclopedic enterprises in Switzerland, a geographic-intellectual expression that was anxious to be known and revered in its own right and had begun making inroads in European centres of erudition.[37]

Bonnet's selection and comparison of the content of articles by the same title as they appeared in both compilations was driven by his desire to find out whether the doctrines he had established through his publications had been properly discussed, and more importantly, whether or not they had been attributed to him. The Paris encyclopedia was sorely lacking in its referencing of Bonnet's work as foundational, while the Yverdon compilation never failed to recognize him or his previous publications. The meaning of a Swiss as opposed to French encyclopedia was clear from the sources utilized by a new set of contributors, who were Swiss.[38]

The *Encyclopédie* d'Yverdon offers an ideal vantage point from which to analyze networks diachronically. The idea to create an encyclopedia to counterbalance the *Encyclopédie* de Paris, the French summa of the state of knowledge mid-eighteenth century, was actually the brainchild of Raimondo di Sangro, the Prince of San Severo. Neapolitan nobleman, di Sangro was the founder of the first Masonic lodge in Naples in 1740. Silenced, eventually, by the papal nuncio who targeted di Sangro as a threat to Catholic interests, the Prince nevertheless pursued his Masonic beliefs through a variety of erudite contacts and projects that he conducted beneath the radar of his adversaries. His own scientific pursuits which hovered between alchemy, vitalism, anatomy, the study of ancient scripts and peoples, printing in colour, etc., had won him a certain following throughout Europe, especially among like-minded masons, such as Jerôme Joseph de Lalande

[37] See Patrick Coleman, Anne Hofmann and Simone Zurbuchen (eds.), *Reconceptualizing Nature, Science, and Aesthetics. Contribution à une nouvelle approche des Lumières helvétiques* (Genève 1998).

[38] See Clorinda Donato and Kathleen Doig, 'Notices sur les auteurs des quarante-huit volumes de "Discours" de l'Encyclopédie d'Yverdon', *Recherches sur Diderot et sur l'Encyclopédie* 11 (1991), 133–141.

in Paris and Vincenz Bernhard von Tscharner in Bern. By 1756, following the death of tolerant pope Benedict XIV, di Sangro knew that the plans he had outlined for an encyclopedia could no longer be brought to fruition in Naples. He was particularly concerned that his protégé, Fortunato Bartolomeo De Felice, would never fulfill his promise in a devolving situation for intellectual pursuits in Italy. By 1757, Albrecht von Haller had been back in Switzerland for four years. Gone was university life as he had known it in Göttingen and the ability to train students and expand experimentation and research through team efforts. Haller sought new avenues for propagating his ideas. As mentioned above, 1757 coincides with a peak in Haller's correspondence with Italy. Italy had a strong affinity for the work of both Haller and Bonnet and was considered a powerful, potential ally for cultural, editorial and scientific partnerships. Thus the converging needs of Italian and Swiss networks established a permanent bond between their erudite agendas. Once Haller was back in the Bernese territories post-Göttingen, he realized the benefits that could be wrought by an in-house periodical in his beloved, native Bern, a city that was trying to build its European profile. We can imagine that he missed the ready access to media outlets for the propagation of his research and ideas in the absence of a university and a scholarly publishing outlet such as the *Göttingische Gelehrte Anzeigen* [GGA], for which he had served as chief editor 1747–1753. He continued to review for the journal, which kept the flow of new publications and projects coming his way, while others curried his favour as a potential reviewer for their work, hoping that favourable coverage from Haller would launch or consolidate their position in the European scientific community. Haller felt a strong impetus to develop the intellectual capital of Bern through the dissemination of its knowledge output, with himself as primary source. Bringing De Felice to Bern to launch two Swiss academic journals, each of which targeted a portion of the European audience, was the boldest way to declare Bern as an aspiring cultural and scientific presence.

Triangulated Transfer: The Overlapping Epistolary Relationships of Bianchi, De Felice and Haller

De Felice, however, never gave up on the idea that his journals and future editorial projects would draw heavily from his Italian network. Paramount among the members of that network was Giovanni Bianchi, known equally by the name Jano Planco, which he adopted to differentiate

himself from Giambattista Bianchi, professor of anatomy in Turin.[39] Bianchi was the anatomist from Rimini who harboured De Felice as he ascended the peninsula in 1757 on his clandestine exit from Italy. Bianchi's Swiss connection with Albrecht von Haller began in 1755, the year of the first of Haller's 29 letters to him.[40] Bianchi as Italian correspondent with Haller represents a case that is different from those of the 27 Italians who tried to replicate Haller's experiments and placed themselves firmly in one camp or the other. Bianchi functioned as a respected colleague who shared some points of a similar career history with Haller. Like Haller, Bianchi had found himself in a difficult university situation where his colleagues looked upon his experiments with a jaundiced eye. He ultimately left the University of Siena to return to his native city of Rimini, lured back by the local nobility that realized the intellectual and medical vacuum that Bianchi had left. Back in Rimini in 1745, Bianchi established a prestigious school that graduated several top flight scholars, a museum of anatomical curiosities visited by many on the Grand Tour, and a copious epistolary relationship that resembled Haller's.[41] The parallels between Bianchi and Haller are striking, despite the smaller scale of Bianchi's achievements. They bear mentioning, though, as they provide insight into a particular kind of scholar and role in the Republic of Letters. Like Haller, Bianchi did not suffer fools lightly. He was sure-footed in his analyses as both an anatomist and practicing doctor, as well as an expert on antiquities who was consulted for his evaluation by grand tourists.[42] Had he hailed from a more powerful family, rather than poverty, he might well have developed into a primary figure in the history of Italian and European anatomy.[43] Impressed by Bianchi's genius, his teacher and mentor in Rimini, anatomist Antonio Leprotti, oversaw his studies and made the introductions that enabled him to matriculate in the

[39] Giambattista Bianchi (1681–1761). He was also a regular correspondent of Albrecht von Haller's.

[40] See Alessandro Simili, 'Carteggio inedito di Alberto Haller con Giovanni Bianchi (Jano Planco) (ed appendice di altri inediti documenti halleriani)', *Minerva medica* 56 (1965), 1–43.

[41] Bianchi's passive correspondence can be consulted at the Biblioteca Gambalunghiana, Rimini, as well as copies and summaries of some of his active correspondence.

[42] See Angelo Turchini, 'Giovanni Bianchi (Iano Planco), l'Ambiente antiquario riminese e le prime esperienze del card. Garampi (1740–1749)', in *L.A. Muratori storiografico* (Modena 1972), 383–424.

[43] See Antonio Montanari, *La Spetaria del Sole. Iano Planco giovane tra debiti e buffonerie* (Rimini 1994).

university at both Padua and Bologna. He quickly made a name for himself among the stellar professors who recognized his genius, but also his difficult temperament. He was denied a most coveted position in Padua for this reason.[44] Yet he was solicited by the Grand Duke of Tuscany to accept the chair of anatomy at the University of Siena, where anatomy and science had remained stuck in theory and book learning, with no anatomical experimentation or study whatsoever. Bianchi had written a number of well-respected anatomical articles and pamphlets that had inspired the Grand Duke to install him at the University in Siena to update medical teaching, but he soon found himself at loggerheads with his colleagues.[45] He was very vocal about his disputes with them and let no occasion go by without reminding his correspondents and acquaintances how unhappy he was over his position in Siena and the resistance of his colleagues to his innovative methods and teaching. His frustration would ultimately manifest itself in a medical novella, *Le Breve storia di Catterina Vizzani*.[46] He used this means to report a purportedly real incident of malpractice committed by his Sienese colleagues and their students because their knowledge and training were lacking in anatomical instruction. Bianchi chose the literary guise for this attack in order to reach a wider public. He wrote the novella and published it himself as a final gesture of revenge against his Sienese colleagues.[47] Like Haller, Bianchi had literary ambitions and had written several short stories in the style of Boccaccio. Unfortunately, with the exception of a few fragments, only this medical novella survives as an example of his literary output.[48] Its quality and content prompted interest outside of Italy, as demonstrated by John Cleland's translation and adaptation of it in England in 1751 some seven years after it was published in Italian; a second edition was published in 1755.[49] Bianchi's desire

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[44] See Angelo Turchini, 'Il tentativo di Jano Planco di salire sulla cattedra del Cicognini nel 1740', *Quaderni per la storia dell'Università di Padova* 5 (1972), 91–105.

[45] For a history of Bianchi in Siena, see Vincenzo Mazzi, 'Giovanni Battista Bianchi "IANUS PLANCHUS" ed i suoi rapporti con l'Università e la cittadinanza di Siena', in Baccio Baccetti et al. (eds.), *Documenti per una storia della scienza senese* (Siena 1985), 141–181.

[46] Giovanni Bianchi, *Breve storia della vita di Catterina Vizzani romana che per ott'anni vestì abito di huom in qualità di Servidore la quale dopo vari casi essendo in fine stata uccisa fu trovata Pulcella nella sezzione del suo Cadavero* (Venice [Florence] 1744).

[47] For a discussion of the cultural, medical and sexual implications of the *Breve storia*, see Paula Findlen, 'Anatomy of a Lesbian: Medicine, Pornography, and Culture in Eighteenth-Century Italy', in Findlen, Wassyng Roworth and Sama 2009 (note 9), 216–250.

[48] This output is described in Maria D. Collina, *Il carteggio letterario di uno scienziato del Settecento (Janus Plancus)* (Firenze 1957).

[49] *An Historical and Physical Dissertation on the Case of Catherine Vizzani, Containing the Adventures of a Young Woman, Born at Rome, Who for Eight Years Passed in the Habit*

to challenge his adversaries through publication reminds us of Haller's attacks on Voltaire and La Mettrie and is indicative of the two scientists' similar mettle.

Bianchi weighed in on the most controversial topics of the day, including vaccination, the bile ducts, and monsters, and his opinions were highly respected.[50] He was very secure in his erudition and did not suffer fools lightly. Diplomacy was not one of his strengths, but loyalty was. He admired intelligence and despised hypocrisy, which is one of the reasons he was so attracted to Fortunato Bartolomeo De Felice's plight as an erudite man who was impeded by issues of class, hypocrisy, sexual and social convention. He defended De Felice against those who cited his relationship with the Countess Panzutti as a typical example of the excesses of the *abbé gallant*. Bianchi knew exactly what it meant to be brilliant, but because of class, to have to depend on others to get ahead, and perhaps, not get as far. However, intelligence, personality and connections, wielded in the proper way, had begun levelling the playing field in the second half of the eighteenth century, as this particular set of relationships demonstrates. By comparing two complementary sets of correspondence, i.e., the exchanges between Albrecht von Haller and Giovanni Bianchi and those overlapping in time that took place between Giovanni Bianchi and Fortunato Bartolomeo De Felice once he was in Berne, we find concrete evidence of how networks overlapped and operated.

The Bianchi-Haller exchange, as we have mentioned, was confined to scientific matters and the exchange of scientific materials, ideas, and reflections about other scientists and their theories within the Republic of Letters. It was a correspondence among equals. Each was curious about the other, yet did not dare broach certain subjects directly. The Haller-Bianchi correspondence shows in letter after letter how Haller uses Bianchi as a sounding board, a place to test the waters regarding the

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of a Man, Was Killed for an Amour with a Young Lady; and Being Found, on Dissection, a True Virgin, Narrowly Escaped Being Treated as a Saint. With Some Curious and Anatomical Remarks on the Nature and Existence of the Hymen. By Giovanni Bianchi, Professor of Anatomy at Sienna, the Surgeon Who Dissected Her. To Which Are Added, Certain Needful Remarks by the English Editor [translated by John Cleland] (London 1751); for the second edition with a slightly altered title, see Giovanni Bianchi, *The True History and Adventures of Catherine Vizzani, . . . With Curious Anatomical Remarks on the Nature and Existence of the Hymen. With a Curious Frontispiece* (London 1755).

[50] For a complete discussion of his medical publications, their reception and a complete bibliography, see Stefano De Carolis and Angelo Turchini, *Giovanni Bianchi: medico primario di Rimini ed archiatra pontificio* (Verucchio 1999).

reception of his ideas among the vast network of Italian scientists and doctors who were redoing Haller's experiments. The Bianchi-De Felice exchange is of a different, yet complementary nature. This correspondence has been discussed in an excellent article by Stefano Ferrari within the context of Swiss-Italian cultural transfer.[51] Ferrari highlights how De Felice, once in Bern, served as a mediator between Haller and Bianchi on matters related to the potentially enhanced reputation of each in their respective contexts, i.e., Haller in Italy and Bianchi in Switzerland. This exchange also served to "round out" the information that each had about the other, beyond the scientific realm, as can be seen from the following excerpt from a letter that De Felice sent to Bianchi 31 July 1757:

> Mr. Haller, who with his great talent finds himself with few resources and extremely poor, burdened by a numerous family of eight children, wants to know if you are married, what your moral and political views are and what your economic status is. I have already told him that your were born to please everyone, that you extracted great pleasure from doing so, that you inherited a great deal from your family, that you receive a good pension from the City and that besides, you had been recruited among the Nobility, and that being the excellent doctor that your are, unique among all other doctors in these parts, you are sought out by everyone, even those outside of Rimini, as can be seen from that fact that you have also gone to Florence, called by the Lord Governors etc. I told him that you live sumptuously, having myself lived with you for a number of days, that you have a carriage, an opulent Museum devoted to the study of Antiquities and Natural History with a corresponding Library whose books are still kept in boxes since there isn't enough room for all of them. I said that you are lavish, generous and free in sharing what you own with others and I added that for these reasons you are greatly loved in all of Italy.[52]

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[51] Stefano Ferrari, 'L'epistolario di Fortunato Bartolomeo De Felice e il *transfert* culturale italo-elvetico', Corrado Viola (ed.), *Le carte vive. Epistolari e carteggi del Settecento* (Roma 2011), 399–410.

[52] "Il Sig.r Haller, che con tutto il suo gran talento si ritrova scarso di cerimonie, e poverissimo, carico di una numerosa famiglia di 8 figli, volle da me sapere lo stato di V. S. civile, morale, politico, ed economico. Io già gli dissi, che lui era nato per far piacere a tutti, e che nel farlo godeva, che molto possiede di sua Famiglia, che à una buona pensione dalla Città, da cui ancora è stato arruolato fralla Nobiltà, che facendo la Medicina buona assaissimo, perché unico, e di tutti Maestro per codesta contrada, cosicché vi è per tutto chiamato, ed anche fuori di Stato, come apparisce dall'essere andato anche in Firenze, e pel Sig.r Governatore ecc. Che vive lautamente, essendone io stato partecipe per più giorni, che tien carrozza, che ritrovasi un ricchissimo Museo, spettante allo studio dell'Antichità, e della Storia Naturale, con una corrispondente Biblioteca, i cui libri tiene ancora nelle casse, non sapendo più ove collocarli, e che di quanto possedeva era prodigo,

Unfortunately, the letters from Bianchi to De Felice have not survived, but we can easily imagine that Bianchi was flattered by this attention. Like Haller, he had left a university position to return to his home town; yet, ironically, Bianchi was better positioned economically than Haller. Moreover, he possessed the trappings of an erudite, highly regarded scholar—respect, fame, a museum, a library, and a wide-ranging reputation for his medical prowess, with hundreds of illustrious correspondents to show for it. The information that Haller and Bianchi gleaned about each other from their intermediary, De Felice, helped them position themselves so that they could better know what to expect from the relationship in terms of benefits. We can speculate that this information was more important for Haller, because less was known about Bianchi in the public domain since he had published far less than had Haller. Thus information about Bianchi could only be gleaned through personal contact and anecdote, which De Felice was able to provide. There is no question that Bianchi knew a great deal about Haller, but was probably surprised to discover that his financial situation was not particularly florid. In his role of mediator, De Felice succeeded in acquiring what he needed, which was support on both the Italian and the Swiss ends for his journals and for his new position as journalist/editor/publicist/publisher in Bern and later on in Yverdon-les-Bains. De Felice transmitted information to each that would be useful to them and to him in securing the success of the Italian and Latin journals he was assigned once in Bern.

Haller's influence on De Felice's career, and vice-versa, became possible because of De Felice's abrupt move to Switzerland. This underscores the crucial role of geography and geographical location in the development of nodes of Enlightenment thought and knowledge transfer. Bianchi was an important node of contact between Naples and Bern and was able to intervene on De Felice's behalf thanks to his reputation and his relationship with Giambattista Morgagni in Padua. Indeed the complete circle of the network was formed by Bern, Naples, Rimini and Padua. Thanks to the contact between Haller and Bianchi in 1755, the proper end nodes were in place for Fortunato Bartolomeo De Felice to move from Naples to Switzerland through Rimini and Padua. In a letter of 11 June 1757 Haller writes to Bianchi to tell him that he is impressed with De Felice, who has safely

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non che generoso, e liberale, soggiungendo essere perciò amato per tutta l'Italia." Ferrari 2011 (note 51), 403.

arrived in Bern. He thanks Bianchi profusely, and also expresses his gratitude to Padua anatomist Giambattista Morgagni for having recommended De Felice to him.[53] De Felice becomes a special connection for them, which is highlighted in the Bianchi-De Felice correspondence.

Though other scholars have discussed the Bianchi correspondence, Ferrari has succeeded in underscoring its salient elements as evidence of how the Italian-Helvetic cultural transfer operated to produce tangible outcomes, to move and create knowledge, but especially, to highlight how each member of this network used the connection to promote personal gain through the favours that were requested and either granted or not as the case may have been. Haller's own experiences as the editor of the *Göttingische Gelehrte Anzeigen* have been passed on to De Felice as he attempts to establish his two journals in Bern. He had learned much about the scholar's mindset as editor, in particular, the fact that the striving for fame constituted "the driving force behind research in general and controversies in particular".[54] De Felice discusses the need to curry the favour of scholars whose aid he is seeking in the writing of reviews. However, his primary concern is to garner both the commercial and intellectual collaboration of potential patrons and scholars who move in Bianchi's orbit. Ferrari reminds us that the conditions of De Felice's flight from Italy left in its wake a series of abruptly broken off relationships with his Italian circle. Corresponding with De Felice, now branded a heretic due to his conversion to Protestantism, had become a liability for many in the less permissive atmosphere that reigned in Italy subsequent to the death of Benedict XIV in 1756. Bianchi became his potential point of contact with those broken ties—ties he needed to launch his journals. He asks Bianchi to procure the sources of any number of Italian editors and journalists because information about Italy's scholarly output is almost completely lacking in Switzerland.[55] He also asked Bianchi to explore the prospect of publishing the *Estratto della letterature europea* in Italy. In the absence of Bianchi's responses, we can only assume that the project to print the journals in Italy was rejected, which ultimately created the conditions for establishing a publishing house with Bernese money, the *Typographishe Gesellschaft Bern*, and later, a second

[53] Simili 1965 (note 40), 14–15.
[54] Steinke 2005 (note 6), 54.
[55] Ferrari 2011 (note 51), 403. De Felice names all of the major periodicals of Italy—he even asks for those that are published by journalists that both he and Bianchi have little respect for, such as the Jesuit Francesco Antonio Zaccaria.

publishing enterprise once De Felice had relocated to Yverdon-les-Bains, *La Société typographique d'Yverdon*.

By reading the correspondences in tandem from the perspective of networks, the genesis and unfolding of a number of scholarly commercial enterprises becomes evident. As scholars "worked" their networks, we find conflicts, resolutions, collaborations, and projects emerge that would ultimately make the careers of those involved to as great an extent, we might speculate, as did the scholarly work they produced in universities, academies, and in the publishing business. While there were tiers of scholars, this study exemplifies how the various tiers interacted across time, space, languages and erudition styles. The brilliant discoveries and writings of an Albrecht von Haller depended heavily on exchanges with fellow, albeit less famous colleagues, such as Bianchi, as much as he depended on an erudite mediator, such as De Felice, who could get the word out.

We might say, in closing, that the relationship between Bianchi, De Felice and Haller carries all of the hallmarks of the best that can be invested and reaped in the reciprocal exchange of knowledge, favours, criticism, friendship, projects and ideas that characterized their multi-year relationships in the Republic of Letters. The study of how these networks formed, functioned and evolved as documented in correspondences brings to life in living color the relationships of those whose passion for science was on equal par with their passion for fame and friendship in the Republic of Letters.

AT HOME IN THE WORLD: THE SAVANT IN THE SERVICE OF GLOBAL EDUCATION

Karl S. Guthke

The Emergence of the Idea of Global Education in the Eighteenth Century

"The proper study of mankind is man"—but why include the exploration of the ways of New Zealand cannibals? In the second half of the eighteenth century Europeans had an answer: awareness of the world at large and its inhabitants would result in nothing less than a new, comparative understanding of human nature in general—and of themselves in particular.

From about mid-century, scholars, scientists and public intellectuals championed this idea, intrigued by what Burke called "the great map of mankind"[1] unfolding under their eyes in the increasingly numerous accounts of expeditions to remote corners of the world. Unlike the voyages of an earlier age, undertaken for profit or the saving of savage souls, the "philosophical voyages" of the "second age of discovery", with their naturalists and anthropologists aboard, while not always innocent of political or commercial motivation, were to gain more knowledge of the world and especially a more adequate "idea of our species".[2] To qualify as an educated person, it was no longer sufficient to look inward or to study European cultural history all the way back to Antiquity; *global*, rather than traditional *humanistic* education was becoming the order of the day. As Burke, Herder and others postulated, Europeans should now turn their attention to contemporary Persia, Egypt, China and Japan rather than ancient Greece and Rome and take cognizance of the various degrees of "barbarism" and "refinement" (Burke) encountered in distant latitudes and longitudes; "to study man", Rousseau claimed, "one needs to learn to look in the distance".[3] What counts now, as the horizon is widening, is

[1] Thomas W. Copeland (ed.), *The Correspondence of Edmund Burke* (Cambridge 1958–1978), 10 vols., III: 350–351.

[2] Georg Forster, *Georg Forsters Werke. Sämtliche Schriften, Tagebücher, Briefe*, ed. by Berlin-Brandenburgische Akademie der Wissenschaften (Berlin 1958ff.), vols. 1ff., V: 295.

[3] Jean-Jacques Rousseau, *Essai sur l'origine des langues, où il est parlé de la mélodie et de l'imitation musicale*, ed. by Charles Porset (Bordeaux 1970), 89; Burke: see note 1; Johann

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the encounter, ideally in person, but realistically through reading travel accounts, with non-European ways of living, thinking and feeling; these are considered, at least in principle, to be just as valid as the occidental ones and therefore an invitation to rethink and reconfigure one's own *Bildung*. What beckoned as the prize of such an endeavour was a "truly wise life" [echte Lebensweisheit].[4]

By the time Victoria came to the throne, the idea had come close to being a cliché, even in non-colonizing German lands whose "unfamiliarity with the world", Lichtenberg had attested in 1778, was "unusual".[5] In 1836 Karl Heinrich Hermes, a prominent anthologist of exotic travelogues for the young, felt that it was now agreed that "no part of the earth, no nation, no matter how remote, must remain unknown to us, if our *Bildung* is not to be highly deficient".[6] Global education had become an integral feature of the Enlightenment.

The emergence of the concept and the reality of global education did not just happen; it was brought about by the intellectuals of the age. Not limiting themselves to mere rhetoric, they pursued specific strategies and undertook concrete steps to ensure that the new *Bildung* would once and for all make the educated classes feel "at home" in parts of the world that their parents had at best known as mere names or fabled locations, as Johann Christoph Adelung put it.[7] These strategies and practises may be grouped under three headings (among which there is, however, some overlapping): accumulation, consolidation and organization of knowledge about the extra-European world, transfer of such knowledge inside and outside the scholarly community, advancement of such knowledge beyond the *status quo*.

Gottfried Herder, *Werke in zehn Bänden*, ed. by Günter Arnold et al. (Frankfurt/M. 1985–2000), 10 vols., IX/2: 70.

[4] Friedrich Schlegel, *Kritische Schriften und Fragmente*, ed. by Ernst Behler and Hans Eichner (Paderborn 1988), 6 vols., I: 194. For a comprehensive treatment of this topic, see Karl S. Guthke, *Die Erfindung der Welt. Globalität und Grenzen in der Kulturgeschichte der Literatur* (Tübingen 2005), 9–82.

[5] Wolfgang Promies (ed.), *Schriften und Briefe* (München 1967–1992), 6 vols., III: 269.

[6] Karl Heinrich Hermes (ed.), *Neueste Sammlung merkwürdiger Reisebeschreibungen für die Jugend* (Braunschweig 1836), 2 vols., I: V–VI.

[7] *Geschichte der Schiffahrten* (Halle 1768), 3.

Accumulation, Consolidation and Organisation of Knowledge

Knowledge has to be consolidated and organized to yield its significance and allow for systematic augmentation. Such consolidation and organization takes two forms (not entirely new, but significantly invigorated in the eighteenth century): the collection and pertinent arrangement of plant, animal and cultural specimens from non-European parts of the world and the critical assembling of what has appeared in print concerning those regions. The former would lead to the establishment of institutions such as botanical and zoological gardens and ethnological museums, the latter to universal histories, encyclopedia entries and, above all, to collections of travel accounts and book series specializing in exotic travelogues, with libraries taking a middle position between institutional and publishing enterprises.

Botanical and zoological gardens that scholars established (with the help of a vast network of overseas contacts) everywhere in Europe—from Haller's Göttingen and Linné's Uppsala to Buffon's Jardin du Roi and Joseph Banks' Kew Gardens, from the Imperial Menagerie at Schönbrunn to the zoo added to the Jardin des Plantes in Paris—recreated foreign habitats, with the accent on the exotic strongest perhaps in the Jardin d'Acclimatation des végétaux exotiques in Nantes.[8] More important from an anthropological viewpoint were (in the absence of nineteenth-century *Völkerschauen* à la Hagenbeck) ethnological museums featuring the artifacts of exotic populations. Evolving from earlier "cabinets of curiosities" both natural and artificial, these collections included Blumenbach's "Ethnologische Sammlung", incorporated into the Göttingen University Akademisches Museum in 1773, Hans Sloane's myriad of artifacts (ranging from bark textiles to fishing hooks) that were acquired through an Act

[8] Jean-Marc Drouin and Luc Lienhard, 'Botanik', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008), 292–314: 309 (Linné); Hubert Steinke and Martin Stuber, 'Haller und die Gelehrtenrepublik', ibid., 381–414: 400–401 (Haller); Regina Dauser et al. (eds.), *Wissen im Netz. Botanik und Pflanzentransfer in europäischen Korrespondenznetzen des 18. Jahrhunderts* (Berlin 2008); Lucille Allorge and Oliver Ikor, *La fabuleuse odissée des plantes. Les botanistes voyageurs, les Jardins des Plantes, les herbiers* (Paris 2003); David Philipp Miller, 'Joseph Banks, Empire and "Centers of Calculation" in Late Hannoverian London', in David Philipp Miller and Peter Hanns Reill (eds.), *Visions of Empire. Voyages, Botany, and Representations of Nature* (Cambridge 1999), 21–37; Hector Charles Cameron, *Sir Joseph Banks, K.B., P.R.S. The Autocrat of the Philosophers* (London 1952), chapter 2; Pierre Huard and Ming Wong, 'Les Enquêtes scientifiques françaises et l'exploration du monde éxotique aux XVII^{e} et XVIII^{e} siècles', *Bulletin de l'école française d'extrême orient* 52 (1964), 143–154.

of Parliament in 1753 and incorporated into the British Museum as well as the turn-of-the-century acquisitions of the Muséum d'histoire naturelle in Paris. They all held sizeable contingents of objects brought home by the "philosophical voyagers" of the time, Cook and the Forsters prominently among them.[9] Similarly, Napoleon's Egyptian loot, resulting from the expertise of scores of savants recruited for his military expedition of 1798, ended up in various European collections, including the British Museum, which to this day displays the Rosetta Stone that was one of the major objects of scholarly interest and cultural consequence at the time, opening up, after Champollion's decipherment, a whole new intellectual world.

That such collecting activity, which brings into full view the worldwide diversity of cultural self-articulation, has an educational aspect is self-evident. Johann Gottfried Gruber, a universal historian, spelled it out in 1798 *à propos* of Blumenbach's *De generis humani varietate nativa*: nothing less than "true humanity" had developed from the new awareness of such diversity.[10] More concrete were the 1741 instructions for guides in the "Wunderkammer" of the Francke Foundation in Halle (which boasted Egyptian mummies, Indian ritual objects, articles of clothing from China and Greenland among its many artifacts): the main purpose of the collection was "to bring the whole world (natural objects as well as artifacts) together here in miniature, . . . not just to be looked at but for the benefit of local pupils as well as others so that early in life they may gain a better idea of God and the world."[11]

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[9] Peter James Marshall and Glyndwr Williams, *The Great Map of Mankind. Perceptions of New Worlds in the Age of Enlightenment* (Cambridge 1982), 58–59; Hans Plischke, *Die ethnographische Sammlung der Universität Göttingen. Ihre Geschichte und ihre Bedeutung* (Göttingen 1931); E. St. John Brooks, *Sir Hans Sloane. The Great Collector and His Circle* (London 1954), chapter 11; Arthur MacGregor (ed.), *Sir Hans Sloane* (London 1994), 228–244; Brigitte Hauser-Schäublin and Gundolf Krüger (eds.), *James Cook. Gifts and Treasures from the South Seas* (München and New York 1998); Justin Stagl, *Eine Geschichte der Neugier. Die Kunst des Reisens 1550–1800* (Wien 2002), 142–152; Thomas Nutz, *"Varietäten des Menschengeschlechts". Die Wissenschaften vom Menschen in der Zeit der Aufklärung* (Köln, Weimar and Wien 2009); Emma C. Spary, *Utopia's Garden: French Natural History from Old Regime to Revolution* (Chicago 2000); Stefan Siemer, *Geselligkeit und Methode. Naturgeschichtliches Sammeln im 18. Jahrhundert* (Mainz 2004); Anke te Heesen, Emma C. Spary (eds.), *Sammeln als Wissen. Das Sammeln und seine wissenschaftsgeschichtliche Bedeutung* (Göttingen 2001).

[10] Johann Friedrich Blumenbach, *Über die natürlichen Verschiedenheiten im Menschengeschlechte*, ed. by Johann Gottfried Gruber (Leipzig 1798), V–VI.

[11] Thomas J. Müller-Bahlke, *Die Wunderkammer. Die Kunst- und Naturalienkammer der Franckeschen Stiftungen zu Halle (Saale)* (Halle 1998), 37.

As for the newly emerging *written* knowledge about the world at large, the obvious collecting points were the libraries, private, public or in between. Goethe's systematic efforts, as director of the Ducal library, to secure vast amounts of exotic travelogues for Weimar have only recently been uncovered.[12] He also gave the cue for what the reading of such works, made accessible to the general reader, would provide in landlocked provincial Germany: "magnificent instruction", "thorough insight", "pure humanity", in a word: such works "enlighten" us—surely a broadly educational effect.[13] It was, however, the Göttingen University Library that established itself as the foremost eighteenth-century German treasure house of recent travelogues. This was due to the farsighted educational initiative of Gerlach Adolph von Münchhausen, the *spiritus rector* of the young university, who issued a "decree that voyages and travel accounts were to be acquired as comprehensively as possible",[14] and to the untiring collecting efforts of classics professor Christian Gottlob Heyne, who was director of the library from 1763 on. The Göttingen holdings of travelogues served as source material for the scientific disciplines that were just then establishing themselves: geography, anthropology and ethnology. Both Blumenbach and Christoph Meiners, the other leading Göttingen ethnologist at the time, could plausibly claim that they had read, for the benefit of their scholarly work, every exotic travel account that the Library owned.[15]

Meiners called his ethnological survey of the "great map of mankind" *Grundriß der Geschichte der Menschheit* (1785). Such universal histories sprang up everywhere now (Iselin, Schlözer, Voltaire, Herder, etc.), and they might just as well have been called ethnological surveys, as one of them, Gruber, frankly admitted.[16] The towering monument of the genre, the seven-volume *Universal History* (London 1736–1744), was not slow to point out the educational value and function of such a conspectus of "all Times and Nations": "Every judicious Reader may form . . . Rules for the Conduct of his Life" as he becomes an "Eye-witness" of world history—

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[12] Karl S. Guthke, *Goethes Weimar und die "Große Öffnung in die weite Welt"* (Wiesbaden 2001).

[13] Johann Wolfgang von Goethe, *Goethes Werke* (Weimar Edition), first section, VII: 183 and 216–217; cp. Guthke 2001 (note 12), 90–91.

[14] Cited from Bernhard Fabian, *Selecta Anglicana* (Wiesbaden 1994), 187.

[15] Hans Plischke, *Johann Friedrich Blumenbachs Einfluß auf die Entdeckungsreisenden seiner Zeit* (Göttingen 1937), 3–4; Michael C. Carhart, *The Science of Culture in Enlightenment Germany* (Cambridge 2007), 228–229 (Meiners). See ibid., 228–240: "The scientific use of travel reports"; Michael T. Bravo, 'Ethnological encounters', in Nicholas Jardine, James A. Secord and Emma C. Spary (eds.), *Cultures of Natural History* (Cambridge 1996), 338–357.

[16] Guthke 2005 (note 4), 42–48.

and thereby of the ways of exotic populations (I: v). Much the same can be claimed for the many comprehensive encyclopedias published in several European languages at the time whose *précis* of knowledge about the non-European world derived from the myriad travel accounts of the century as well. Recent studies have tellingly brought to light just how such encyclopedic enterprises functioned in popularizing an enlightened awareness of expanding horizons, thereby offering their readers a compact course in global education.[17]

Of similar interest as vehicles of communication addressing audiences within or beyond the fringes of the scholarly community are those enterprises (often firmly in the hands of *bona fide* scholars such as Haller, A.G. Kästner, J.R. Forster, C.D. Ebeling, J. Bernoulli, Blumenbach and the cartographer John Green) that critically coordinated those proliferating exotic travelogues that were the source material of encyclopedia entries, universal histories and ethnographical treatises. The resulting compilations of such travel accounts—several of them at any rate, notably Blumenbach's *Sammlung seltener und merkwürdiger Reisegeschichten* (1789) and Thomas Astley's *New General Collection of Voyages and Travels* (4 vols., 1745–1747, incomplete)—unlike their predecessors since the sixteenth century, aspired to critical evaluative procedures in the selection, correction, revision, arrangement, authentication and annotation of their material.[18]

Astley's much translated compilation also hinted broadly at the educational effect and ideal implied in the purveyance of such reliable information about faraway lands and peoples; speaking of the "Knowledge . . . attained of the greater Part of the Earth, till then quite unknown", it stated: "By these Discoveries, a new Creation, a new Heaven and a new Earth, seemed to be opened to the View of Mankind; who may be said to have been furnished with Wings to fly from one End of the Earth to the other, and bring the most distant Nations acquainted" (I: 9). Awnsham and John Churchill, in their *Collection of Voyages and Travels* (London 1704),

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[17] See the pertinent chapters in Hans-Jürgen Lüsebrink (ed.), *Das Europa der Aufklärung und die außereuropäische koloniale Welt* (Göttingen 2006).

[18] William E. Stewart speaks of the "Verwissenschaftlichung" of such collections in the second half of the eighteenth century; see his *Die Reisebeschreibung und ihre Theorie im Deutschland des 18. Jahrhunderts* (Bonn 1978), 53. On John Green as editor of the *New General Collection*, see Horst Walter Blanke, 'Wissenserwerb—Wissensakkumulation—Wissenstransfer in der Aufklärung. Das Beispiel der *Allgemeinen Historie der Reisen* und ihrer Vorläufer', in Lüsebrink 2006 (note 17), 138–156: 140. Blumenbach's critique is reprinted in Plischke 1937 (note 15), 75–78.

Fig. 1. *Der Reisende Deutsche im Jahr 1744. Welcher Länder und Städte beschreibet, auch die alten und neusten Staats-Begebenheiten bekant macht*, mit einer Vorrede Herrn Martin Schmeitzels (Halle 1745), Frontispiece. Herzog August Bibliothek, Wolfenbüttel.

had been more concrete: readers could, "without stirring a foot, compass the Earth and Seas, visit all Countries and converse with all Nations" (I: lxxiii). Haller, a life-long avid reader of travelogues, "whose mind contains the world" as the motto to J.G. Zimmermann's 1755 biography had it, described the educational value to be derived from such reading in 1750, in the preface to a collection of travel accounts entitled *Sammlung neuer und merkwürdiger Reisen, zu Wasser und zu Lande*: "Through [such accounts] we become familiar with the world and compensate somewhat for the lack of personal experience". Being educated [erzogen] in a country whose citizens all share the same beliefs, morals and opinions, Europeans are prone to "prejudice". To overcome it, nothing is more commendable than familiarity with many peoples of different "Sitten", laws and views. As a result, one arrives at a true understanding of human nature and of oneself. This in turn means that one becomes attuned to the "voice of nature . . . which all peoples share", be they Romans or Hottentots, Swiss or Patagonians.[19] The same large-scale educational thinking was the rationale behind the publication of seemingly interminable book series of individual travelogues such as those launched, with the advice of Goethe, Blumenbach and other scholars, by Friedrich Justin Bertuch from his Industrie-Comptoir in Weimar (along with his various ethnological and geographical handbooks, journals and school books). But it was Joachim Heinrich Campe, followed by the above-mentioned Hermes, who made this rationale explicit by addressing his several series of travelogues, principally about non-European regions, to the school-age population, and we have Hermes' word for it that Campe, by enlarging knowledge of the world and its peoples in this way, did indeed succeed in revolutionizing what Hermes emphatically called "Bildung" in German-speaking territories, by the beginning of the nineteenth century at the latest. Further confirmation of the ideal of global education taking hold is to be found in the upswing of geography teaching in schools, championed as early as 1769 by Herder as a way of "bringing about an era of *Bildung* in Germany", with learned authors of textbooks frequently making the point that global education is now, beginning by mid-eighteenth century, entering into serious rivalry with humanistic pedagogy.[20] The conviction of various scholars, Haller, Goethe, Kant, Georg Forster, Antoine Galland

[19] Albrecht von Haller, *Sammlung kleiner Hallerischer Schriften* (second edn., Bern 1772), 3 vols., I: 135–138.

[20] On Campe, see Stewart 1978 (note 18), 236–249; on Hermes, see note 6 above; on schoolbooks, see Guthke, 2005 (note 4), 73–82; Walter Steiner and Uta Kühn-Stillmark,

included, that reading travelogues was equivalent to travelling the world had evidently borne fruit: travelogues "worked to bring about *Bildung* of every reader" (G. Forster).[21]

With these observations, consolidation and organization of knowledge have already shaded into diffusion or transfer of educationally relevant information.

Transfer of Knowledge

Hoarding of knowledge was not one of the ideals of the age; true enlightenment lay always in the future, and cooperation via communication was the preferred way of approaching it. So exchange of scholarly and scientific information was stepped up and expanded in the course of the century; correspondence crossed the seas and the continents. E. Handmann's portrait of Wilhelm August von Holstein-Gottorp of 1769 shows the prince holding a letter in one hand and resting the other on a globe.[22] Haller's world-wide net of correspondents is only one case in point. Michaelis, Sloane, Banks and Raynal come to mind, not to mention the academies, the Royal Society and the Institut de France with their "corresponding members" the world over. Epistolary communication was supplemented and formalized by the rise of specialized journals, many of them geographical and ethnological. By 1790–1792 Johann Samuel Ersch's *Repertorium über die allgemeinen deutschen Journale und andere periodische Sammlungen für Erdbeschreibung, Geschichte und die damit verwandten Wissenschaften* amounted to three substantial volumes. The role of such geographical and ethnological journals in the spread of global education is highlighted in 1790 in the preface to one of them, the *Neue Beyträge zur Völker- und Länderkunde*: "We are only just beginning to get to know the

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Friedrich Justin Bertuch. Ein Leben im klassischen Weimar zwischen Kultur und Kommerz (Köln 2001), 121–128; Herder 1985–2000 (note 3), IX/2: 32–33.

[21] Haller 1772 (note 19), I: 138; Goethe (note 13), first section, XXXIV/1: 354–355; Immanuel Kant, *Anthropologie in pragmatischer Hinsicht*, preface; Forster 1958ff. (note 2), XI: 183 and V: 296 (quotation); Antoine Galland (trl.), *Les mille et une nuits* (Paris 2004), 21–22; *Allgemeine Historie der Reisen zu Wasser und zu Lande* (Leipzig 1747–1774), 21 vols., I: dedication. Travel accounts were among the favourite books of eighteenth-century reading societies; see Bernhard Fabian, 'English Books and Their Eighteenth-Century German Readers', in Paul J. Korshin et al. (eds.), *The Widening Circle. Essays on the Circulation of Literature in Eighteenth-Century Europe* (Philadelphia 1976), 162 and 171.

[22] Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005), 25.

earth and its inhabitants and with them, ourselves." The author is none other than Georg Forster, who, like his father, had himself contributed a great deal to this growing familiarity with "them" (and thereby with "ourselves") through his *Reise um die Welt*, his several translations and editions of overseas travel writings as well as through numerous reviews of such books.

At a time when books in foreign languages were hard to get hold of on the continent, reviews were among the mainstays of geographical and ethnological journals. Like the books themselves, they bridged the gap between the distant lands and that continental provinciality that Goethe, among others, lamented time and again. Haller reviewed scores of French and English exotic travelogues, guided by his conviction, stated earlier, that they furthered that global awareness, indeed *Bildung*, that was the order of the day.[23] Georg Forster, always eager to take up that cause, agreed; to quote a recent critic: "In addressing a 'common reader', Forster's reviews . . . reveal their closeness to the British *Reviews* he used; so it is no coincidence that one encounters the formula informing their reviews of travelogues—'pleasurable instruction'—again and again."[24]

Outside the print medium, knowledge about far-away lands and populations was transferred—as a regular feature of the formal educational process—in the form of university lecture courses based on travelogues. In the last third of the century, the major continental venue of such transfer (apart from Königsberg where Kant promulgated prejudice along with information) was Göttingen, with Blumenbach, Meiners, Schlözer, Heeren and Johann Heinrich Plath[25] regularly holding forth on "die große weite Welt" for the benefit of students aspiring to be men of the world in a country that did not as yet have that much world.

A further instrument of diffusion of information about exotic parts of the world were—apart from reports, pro and con, on slavery in Africa, America and the Caribbean—writings of missionaries about the ways and beliefs of overseas natives to whom they were bringing the gospel. Above all, it was the Jesuit *Lettres édifiantes et curieuses* (1702–1773, translated in

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[23] See Karl S. Guthke, *Der Blick in die Fremde. Das Ich und das andere in der Literatur* (Tübingen 2000), 11–40.

[24] Helmut Peitsch, '"Noch war die halbe Oberfläche der Erdkugel von tiefer Nacht bedeckt". Georg Forster über die Bedeutung der Reisen der europäischen 'Seemächte' für das deutsche "Publikum"', in Lüsebrink 2006 (note 17), 157–174: 171.

[25] See Guthke 2005 (note 4), 60–62 on Kant and 43–44 on Schlözer; Plischke 1937 (note 15), 6 on Blumenbach; Carhart 2007 (note 15), 228–229 on Meiners; Plischke 1931 (note 9), 29 on Heeren and Plath.

part by John Lockman in 1743, with their ethnological value fully recognized and the proselytizing expunged) that provided rich source materials on the populations of China, California, India, South America and other parts of the world for works like Montesquieu's *Esprit des lois*, Raynal's *Histoire des deux Indes* and Voltaire's *Essai sur les mœurs et l'esprit des nations*—all of them creating that wider horizon which enabled the reorientation from Eurocentric to global *Bildung*.[26]

Much the same is true of the reports of Danish Lutheran missionaries on the natives of Greenland and the Coromandel coast (extensively commented on by Haller with regard to the emerging view of human nature in a global context) as well as those of St. Thomas in the Caribbean.[27] In addition, these Danish missionary activities supply a case history for a final type of encounter with indigenous populations. In 1724 two Eskimos were persuaded by Hans Egede, the founding father of the Danish colony, to sail with him to Copenhagen and to demonstrate their rowing, spearing and other skills in the Royal Park in a grand show honouring the king on his birthday. Carefully recorded were not only the reactions of the Danes to this folkloric-ethnological spectacle, but also the Greenlanders' feelings about life in Denmark.[28] In a sense, this was nothing new. Exotic natives had been exhibited—there is no more tactful word for it—ever since around 1500 when Vespucci returned with a large number of American Indians; one such group inspired Montaigne's essay on cannibalism later in the century. Yet what is different in the "second age of discovery" is that such "visitors" were not merely curiosities to be marvelled at but objects of serious ethnological inquiries and reflections leading ultimately (as did Montaigne's speculations) to an anthropological "Who are *we*?"[29] The most famous cases are those of the South Seas islanders Omai and Aotourou, brought to Europe by Tobias Furneaux, Captain Cook's second-in-command, and Bougainville, respectively. Lichtenberg's encounter

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[26] John Lockman (trl.), *Travels of the Jesuits into Various Parts of the World* (London 1743), 2 vols. On the influence of the *Lettres édifiantes*, see Urs Bitterli, *Die "Wilden" und die "Zivilisierten"* (München 1976), 253; Lockman 1743 (note 26), I: xix–xx; see also Marshall and Williams 1982 (note 9), 83–86.

[27] On Haller, see Guthke 2000 (note 23), 35–37; on the Danish missions, see Peter Stein, 'Christian Georg Andreas Oldendorps *Historie der caribischen Inseln Sanct Thomas, Sanct Crux und Sanct Jan* . . . als Enzyklopädie einer Sklavengesellschaft in der Karibik', in Lüsebrink 2006 (note 17), 175–192 and note 28 below.

[28] Michael Harbsmeier, 'Pietisten, Schamanen und die Authentizität des Anderen. Grönländische Stimmen im 18. Jahrundert', in Lüsebrink 2006 (note 17), 355–370.

[29] On natives brought to Europe, see Bitterli 1976 (note 26), 180–203, especially 187ff.: "Der eingeborene Besucher als Studienobjekt".

with Omai was perhaps the most fundamental learning experience of his life, prompting haunting questions about what it means to be civilized—or not. Omai was more or less the same, morally and otherwise, as the people surrounding him at the London tea-table on that 24 March 1775. Or was he: . . . the polygamist, eating his salmon almost raw, sporting a watch, but not caring to consult it? Conversely, was there not something "savage", even cannibalistic, about Europeans?[30] As for Aotourou, Buffon, de Brosses, d'Alembert, Helvétius and Diderot engaged in exploratory conversations with him; La Condamine wrote an extensive anthropological report on his interview sessions with the antipodean.[31] But more than anybody else, it was Bougainville who gained from Aotourou "insights about his country during his stay with me" in France.[32] In fact, these new insights led Bougainville to "introduce some drastic revisions into the second edition of his book", *Voyage autour du monde* (1771), concerning, *inter alia*, the barbarous class distinctions and aristocratic tyranny in Tahiti[33]—the island he had originally described as paradise on earth, "Nouvelle Cythère". With the point of reference for any aspiration to global *Bildung* thus becoming ambiguous, it is no wonder that the instructions prepared for some of the subsequent exploratory voyages specified that natives should be brought back for further study and debriefing by experts in various fields.[34]

This specification offers a hint of what was perhaps the most important role of scholars in the transfer of knowledge that laid the foundations for the emerging ideal of global education. The fruitfulness of such cultural diffusion depended to a large extent on the qualification of the interlocutors interacting with the natives. For only scholars with expertise pertinent to particular fields of learning could be in a position to enrich, refine

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[30] On Omai as an object of study, see Michael Alexander, *Omai. "Noble Savage"* (London 1977), 72, 99 and 101. On Lichtenberg and Omai, see Hans Ludwig Gumbert (ed.), *Lichtenberg in England* (Wiesbaden 1977), 2 vols., I: 105–106 and 109–111. Cp. Lichtenberg's speculations, unrelated to Omai, on the possible "savage" streak in Europeans in Guthke 2000 (note 23), 93–97.

[31] Bitterli 1976 (note 26), 195; Louis-Antoine de Bougainville, *Voyage autour du monde*, ed. by Michel Bideaux and Sonia Faessel (Paris 2001), 419–423.

[32] Ibid., 233.

[33] Marshall and Williams 1982 (note 9), 267.

[34] Nicolas Baudin, *Mon voyage aux Terres Australes: Journal personnel du commandant Baudin*, ed. by Jacqueline Bonnemains (Paris 2000), 61; Joseph-Marie Degérando, *Considérations sur les diverses méthodes à suivre dans l'observation des peuples sauvages* (Paris 1800), 53.

and contextualize the information solicited through their knowledgeable questioning and observation.

Command of the languages of the natives was the most elementary *sine qua non*. Jesuit missionaries were well aware of this and well prepared; other travellers, however, were all too often barred from the insights that mattered most. Captain Cook put it in a nutshell. "He candidly confessed to me", reported Johnson's Boswell, "that he and his companions who visited the south sea islands could not be certain of any information they got, or supposed they got . . . their knowledge of the language was so imperfect [that] anything which they learned about religion, government, or traditions might be quite erroneous."[35] Not surprisingly, therefore, Michaelis in 1762, Volney in 1787 and Degérando in 1800 insisted that learning the pertinent native languages was an indispensible prerequisite for "philosophical voyages" as they had developed by that time.[36]

The time was right. For quite apart from the practical value of such linguistic competence, the scholarly study of some non-European languages such as Arabic, Persian (and Sanskrit) was establishing itself throughout the eighteenth century as an academic subject in British and continental universities and outside academia as well. Needless to add, such study was pursued in conjunction with, and as an aid to, more broadly cultural and religious studies, dramatically enlarging familiarity with Oriental philosophy and literature, and with Islam, Buddhism and Hinduism. D'Herbelot (in the late seventeenth century), William Jones, Charles Wilkins, Michaelis and Johann Jakob Reiske are the big names here, followed around the turn of the century by the Schlegels and those many savants making up Napoleon's entourage who produced the 23 volumes of the *Description de l'Égypt* (1809–1823), that monumental treasure trove of exotic lore which, together with other sources, added a whole new dimension to global *Bildung*, not to say fashion, much as contacts with China had done earlier. The labours of all these scholars bore fruit in innumerable highly specialized academic treatises, such as those published in the proceedings of the Asiatic Society, founded in Calcutta in 1784 by Jones, and of its various

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[35] Cited from Marshall and Williams 1982 (note 9), 281.

[36] Johann David Michaelis, *Fragen an eine Gesellschaft gelehrter Männer, die . . . nach Arabien reisen* (Frankfurt/M. 1762), preface; Constantin-François Volney, *Voyage en Syrie et en Égypte* (Paris 1787), preface; Degérando 1800 (note 34), 11–13.

European offspring, as well as in grammars and dictionaries, encyclopedic handbooks and critical editions of key cultural texts.[37]

More conducive to the idea of global education of the general reader and non-specialist intellectual were no doubt the translations produced by these scholars of non-European cultures. In particular, they were renderings of (and commentaries on) texts of signal cultural importance, such as the *Bhagavad Gita* (by Wilkins), the *Sakuntala* (by Jones), the Koran (by George Sale) and the *Arabian Nights* (by Antoine Galland), but also of works like Engelbert Kaempfer's late seventeenth-century pioneering account of Japan which Sloane arranged to have translated from the unpublished German manuscript into English in 1727, thus opening up a whole new world fifty years before the book appeared in German.[38] But *how* might a mere translation contribute to the new educational concept? In the most general terms, Georg Forster pointed out, nothing short of "Aufklärung" was being brought about by translations of books that came into focus in the second age of discovery.[39] To be more specific, two literary instances concerning highly influential works may suffice, one from early, the other from late in the century. Galland, in the *avertissement* of his *Mille et une nuits* (1704–1717), saw the cultural significance and educational value of these tales (for Western readers) in their presentation of "the customs and the way of life [mœurs] of the Orientals [and of] their religion, partly pagan, partly Mohammedan", adding that all this, indeed the totality of Oriental social life from the highest to the lowest, is observed in these "Arabian tales" with greater skill than in travelogues—and travelogues were, after all, the foundational texts of what Goethe called "cosmopolitan culture" as distinguished from the more common parochial "inward culture" or of what Georg Forster championed as "general" (that is: global) *Bildung* as distinguished from "local *Bildung*".[40] The second instance comes from Georg Forster's introduction to his translation of the *Sakontala* (1791; from the English of Jones). This work allows European

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[37] For the more or less full story of this, see Marshall and Williams 1982 (note 9); Jürgen Osterhammel, *Die Entzauberung Asiens. Europa und die asiatischen Reiche im 18. Jahrhundert* (München 1998); Robert Irwin, *For Lust of Knowing. The Orientalists and Their Enemies* (London 2006). On Jones, see Bernd-Peter Lange, ' "Trafficking with the other". Ambivalenzen des frühen Orientalismus bei William Jones', in Lüsebrink 2006 (note 17), 273–286. For forerunners of sorts in the seventeenth century, see James Mather, *Pashas: Traders and Travellers in the Isamlic World* (New Haven 2009).

[38] On Sloane and Kaempfer, see Marshall and Williams 1982 (note 9), 87.

[39] Forster 1958ff. (note 2), VII: 69.

[40] Galland 2004 (note 21), 21; Goethe (note 13), first section, LIII: 383; Forster 1958ff. (note 2), VII: 45–56.

readers to "empathize with a different kind of thinking and feeling, different ways of life and different customs". As a result, they enjoy the increase of their "knowledge" [Wissen]. "Wissen", however, in this context is really that broader experience that allows us to reach our full human potential. For the highest degree of "perfection" [Vervollkommnung] cannot be reached until "one has actually received the totality of impressions that experience can furnish"—which is indeed nothing less than the purpose of human life. And that can be achieved, apparently, through familiarization with faraway countries, such as India. They can provide us with that variety of experience that will eventually yield "a more adequate concept of mankind" [richtigeren Begrif der Menschheit][41]—or, more to the point in the present context: such "experience" of the distant other will generate "Bildung" as G. Forster puts it in a review of his essay on Captain Cook.[42] Here, of course, he has travelogues in mind, not literary works.

Advancement of Knowledge

Returning, then, to accounts of exotic voyages, which were the main source of global *Bildung* as they "enlarg[ed] the Mind . . . of Man, too much confin'd to the narrow *Spheres* of particular *Countries*",[43] one wonders: what were the specific scholarly strategies designed to make sure that such *Bildung* or "Aufklärung" (Goethe, G. Forster) would actually result from them—rather than confirmation of prejudice and repetition of outdated yarns about Patagonian giants, ape-like Calibans, mermaids and the like? The news brought home in travelogues had to be checked for accuracy and correctness. These qualities were of course guaranteed by the scholarly calibre of some of the travellers: Niebuhr, Volney and Humboldt come to mind most readily. Even so, tall tales gave travellers a bad press. As a traveller and seafarer, Bougainville remarked polemically, he was considered a liar by definition.[44] Learned criticism of the questionable veracity of travel writing was in fact common, not only in some of the collections of such writings, but also in reviews as well as in subsequent travelogues covering the same ground. In this spirit Haller called for more accounts of travels not to hitherto unexplored regions but to those that

41 Forster 1958ff. (note 2), VII: 286–287.
42 Ibid., XI: 183.
43 *Philosophical Transactions of the Royal Society* 18 (1694), 167.
44 Bougainville 2001 (note 31), 57.

had been misrepresented in earlier ones; for what made a "philosophical voyage" truly philosophical (an instrument of research, in other words) was the thorough scientific grounding of its explorations. This is what was increasingly demanded by the patrons, promoters and intellectual organizers of such enterprises, e.g. Sloane, Banks, Haller, Michaelis, G. Forster, Blumenbach, Degérando, as well as by the scholarly and scientific societies and academies of the time (notably the Royal Society, the Institut de France and the Société des Observateurs de l'homme).[45]

The principal form that this endeavour took were the instructions and questionnaires for specific research expeditions prepared by savants of the sponsoring institutions with a view to directing and sharpening observations and investigations. In what follows, the focus will be the contribution of these instructions to the rise of the ideal of global education.

The connection between scholarly and scientific instructions, long-distance exploratory travel and the widening scope of personality formation was summarized in 1772 by John Coakley Lettsom in *The Naturalist's and Traveller's Companion*, one of several compendia of directions suitable for expeditions to *all* parts of the world and covering *all* scientific and scholarly disciplines, prominently including, in Lettsom's case, anthropology and the examination of the natives' culture or "way of living". "The manners, customs, and opinions of mankind; agriculture, manufactures, and commerce; the state of arts, learning, and the laws of different nations,

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[45] On criticism of existing travelogues, see the remarks above on Astley's and Blumenbach's collections, also Georg Forster, *Reise um die Welt*, preface, and Ray William Frantz, *The English Traveller and the Movement of Ideas, 1660–1732*, University Studies (University of Nebraska), XXXII–XXXIII (1932–1933), chapter 2; Martin Stuber, 'Forschungsreisen im Studierzimmer. Die Rezeption der Grossen Nordischen Expedition (1733–1743) bei Albrecht von Haller und Samuel Engel', *Gesnerus* 57 (2000), 168–181. Reviews: Stewart 1978 (note 18), 42–57. Haller: *Göttingische Gelehrte Anzeigen* (1771), 871. Promoters and societies: Stagl 2002 (note 9), 187–193 and 327–330; Jean-Paul Faivre, 'Savants et navigateurs. Un aspect de la coopération internationale entre 1750 et 1840', *Journal of World History* 10 (1966–1967), 98–124: 100–103; Frantz 1932–1933 (note 45), chapter 1; Stewart 1978 (note 18), 57–63; Sergio Moravia, 'Philosophie et géographie à la fin du XVIII^{e} siècle', *Studies on Voltaire and the 18th Century* 57 (1967), 937–1011: 954–965. Banks was President of the Royal Society and of the Association for Promoting the Discovery of the Interior Parts of Africa, founded in 1788 for the purpose of "enlarging the fund of human knowledge"; on his organization of expeditions, see Cameron 1952 (note 8), 86–92 and 325. Sloane preceded Banks as president of the Royal Society; on his role in planning expeditions, see Brooks 1954 (note 9), 181–186. On Blumenbach's encouragement of research travel, see Plischke 1937 (note 15), 11–70; on Haller and Michaelis, see below; on Forster, see his *Reise um die Welt*, preface; on Degérando, see his *Considérations* (note 34). On the new function of voyages as scientific research expeditions, see also Moravia 1967 (note 45), 959–993.

when judiciously investigated, tend to enlarge the human understanding, and to render individuals wiser, and happier."[46]

Particularly relevant to the achievement of this educational ideal were those sections of the *ad hoc* (as distinguished from all-purpose) travel directives that concerned the exploration of the ways of native populations (rather than the natural world of minerals, plants and animals). Focusing now on instructions that include this cultural aspect (and ignoring commercial and political components that are often, but not always, present) one finds that certain points of emphasis appear as leitmotifs over the decades, sometimes repeated *verbatim*.

One such point is the requirement to treat the natives with "civility and respect" and indeed to "cultivate a Friendship" with them, while at the same time being careful "not to be surprised".[47] In the 1760s this instruction was even issued (by the Admiralty) to those captains who, like Byron, Wallis and Carteret, received no scientific directives and had no scientists aboard. In these cases the instruction does not imply any anthropological interest in and regard for the natives' way of life as authentic alternative modes of existence deserving the consideration of Europeans. For even if the travellers are asked to "get the best information you can of the Genius, Temper and Inclinations of the Inhabitants" the context is unmistakably the imperialistic one of "taking Possession of convenient Situations . . . in the Name of the King of Great Britain".[48] And in this context some knowledge of the inhabitants would, of course, be desirable as possession was to be taken "with the consent of the Inhabitants".[49] To throw this into relief, it is useful to compare the instructions that Robert Boyle had given in the *Philosophical Transactions* of the Royal Society in 1665–1666 (and published in book-form in 1692) for an early version of research travel:

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[46] Third edn., London 1799, viii; for the ethnological and cultural emphasis, see part 2, section 1–3. Other such compendia include Leopold Berchtold, *Essay to Direct and Extend the Inquiries of Patriotic Travellers. A Series of Questions Interesting to Society and Humanity* (London 1789) and Constantin-François Volney, 'Questions de statistique à l'usage des voyageurs' [1795 and 1813], in id., *Œuvres complètes* (Paris 1846), 748–752. For a bibliographical listing of instructions going back to the sixteenth century, see Don D. Fowler, 'Notes on inquiries in anthropology. A bibliographical essay', in Timothy H.H. Thoreson (ed.), *Toward a Science of Man. Essays in the History of Anthropology* (The Hague and Paris 1975), 15–32.

[47] Robert E. Gallagher (ed.), *Byron's Journal of His Circumnavigation 1764–1766* (Cambridge 1964), 4.

[48] Helen Wallis (ed.), *Carteret's Voyage Round the World, 1766–1769* (Cambridge 1965), 2 vols., II: 304 (Wallis' instructions were used by Carteret, his second-in-command).

[49] Ibid.

they include no hint of political conquest—and no admonition on how to treat the natives. Being strictly scientific and guided by anthropological curiosity, they gave more (and more detailed) directions as to what was to be observed about the natives and their frame of mind, and also pointedly envisioned the ultimate, broadly human, not to say educational, relevance of such new knowledge: "True Philosophy" and "the wellfare of Mankind" (I: 140–143 and 188–189).

The instructions for the "philosophical voyagers" of the second age of discovery, unlike those for Byron, Wallis and Carteret, generally followed Boyle's line of inquiry. In some of them dominion was not even a subordinate motivation. Mylius, sponsored by Haller, in the early 1750s was to conduct observations in America "which a philosopher and natural scientist can make of the nature of the country and its inhabitants".[50] Much the same may be said about Humboldt's travels. Niebuhr's Danish-sponsored expedition to Arabia (1761–1767), for which Michaelis drew up both the royal "Instruktion" and the one hundred specific scholarly questions [Fragen] that were to guide the explorations, was to concentrate to some extent on securing information that would be useful to Biblical and even philological studies, but his resulting *Beschreibung von Arabien* (1772) is mostly about the way of life, the customs, social conditions and scholarly accomplishments of the Arab population of what is now Yemen. Yet this, too, was in keeping with both the *Fragen* and the royal instruction which required, *inter alia*, that "the ways [Sitten] and inclinations of the people" were to be reported on. Interestingly, the requirement to exercise "the utmost courtesy" in all encounters with the natives occurs in the royal instruction as well, specifying further that the travellers should "not contradict their religion, even less ridicule it even implicitly"; they are to refrain from everything that might "aggravate" them, and to take care to avoid the impression that their activities harm the country and never to indulge in verbal or physical violence.[51] Clearly, such caution implies respect for the foreign culture rather than the tactical manœuvring of conquistadors such as Wallis. In other words, the foreign culture is viewed as a valid alternative to the familiar Christian and European one. To be sure, the specifically scholarly perspective of Niebuhr's resulting publications does not allow him to hold forth on the idea of global education implied

[50] Rudolf Trillmich, *Christlob Mylius*, dissertation, University of Leipzig, 1914, 135 and 137; see also Haller's "Instruktion", ibid., 140–142.

[51] Dieter Lohmeier (ed.), *Carsten Niebuhr und die Arabische Reise 1761–1767* (Heide 1986), 63–65. For Michaelis' *Fragen*, see above, note 36.

in such an attitude; but a recent editor at least hints at it when he says that Niebuhr provided "the foundation for the intellectual resurrection of the Old Orient"; without his efforts "we would presumably not be in a position today to write the history of the culture which is, after all, the foundation of our western civilisation".[52]

In other instructions, we find side by side the requirement to study the culture of the natives (and to treat them with respect) on the one hand, and the charge to take possession of territories, if only with the consent of the local population, if any, or at least to secure the commercial interest of the seafaring nation, on the other. But beginning with Cook's first voyage (1768–1771) and Pallas' expedition to northern Asia (1768–1774), the former is no longer a mere means to the end of the latter as had been the case with Byron, Wallis and Carteret. Scientific investigation now comes into its own with naturalists and anthropologists pursuing their mandated agenda, even though in retrospect there may be some uncertainty as to which of the two objectives takes centre-stage. Pallas, according to the Imperial Academy's instructions largely worked out by himself, was to record the "ways [Sitten], customs, languages, traditions and antiquities" of Siberian tribes; Cook, the Admiralty demanded, was to "observe the Genius, Temper, Disposition and Number of the Natives . . . and endeavour to cultivate a Friendship and Alliance with them, . . . Shewing them every kind of Civility and Regard" (with all due caution, to be sure). The guidelines furnished to Cook by the Royal Society went even further, in keeping with its exclusively anthropological interests: the natives "are human creatures" and "possessors of the several Regions they inhabit"; they should not be fired upon unless absolutely necessary and generally be "treated with distinguished humanity"; their "Arts" and "Science", their religion, morals and form of government are worthy of respectful attention.[53] All this is evidently stipulated in the spirit of that acceptance of the "other" that is the first step to global education.

Very similar were the circumstances of the 1785–1788 circumnavigation of La Pérouse, whose instructions did speak of political and commercial objectives (as did Cook's and Pallas') but also, and extensively, of those of science and "natural history". Instead of Bougainville's two naturalists,

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[52] Ibid., 85.

[53] Folkwart Wendland, *Peter Simon Pallas (1741–1811)* (Berlin 1992), part 1, 91; John Cawte Beaglehole (ed.), *The Journals of Captain Cook on His Voyages of Discovery* (Rochester 1999), 3 vols. in 4, I: cclxxx, cclxxxiii, 514–517 and II: clxviii (second voyage). The "consent of the natives" requirement is still operative (I: cclxxxiii and II: clxviii).

La Pérouse took an entire "académie"[54] along. Among many other phenomena of scientific interest, its members were to study "the Genius, the character, the ways [mœurs], the habits, the temperament, the language, the form of government and the number of the inhabitants" (I: 48), in other words: the culture of savage populations. And again, this project was to be carried out in the spirit of the utmost respect for the other culture; the friendship of the natives was to be sought (if with all due precautions against a surprise attack); force was to be avoided at all cost; "much gentleness and humanity towards the natives" was *de rigeur*, combined with an effort to "improve their condition"—shades of *la mission civilisatrice* (I: 51–54). This seems to have become the tenor of such instructions; as late as 1819–1821 one hears an echo of it in the directives issued to Fabian Gottlieb von Bellingshausen who, with a team of savants aboard, explored the Antarctic regions at the behest of Tsar Alexander I and the Imperial Academy of Science with a view to an "extension of human knowledge" and no (apparent) interest in territorial gain.[55]

Most directly in the wake of La Pérouse's instructions, not excepting the emphasis on *la mission civilisatrice*, are the directives for Nicolas-Thomas Baudin, the captain of the 1798–1800 scientific (and only secondarily political and commercial) expedition to Australia, sponsored by the Institut de France and the Société des Observateurs de l'Homme. The directives, issued by the Secretary of the Navy and the Colonies, explicitly refer, in the context of "the conduct to be observed toward the natives", to those for La Pérouse; they make a point of enjoining the several scientists to "study the inhabitants" along with plants and animals, but the anthropological, ethnological and broadly cultural focus was clearly the dominant one for this voyage, most explicitly in the eyes of the Société.[56] It should have benefited, above all, from the most elaborate and thoughtful instruction of the age, one that looms large in the beginnings of

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[54] Numa Broc, *La Géographie des philosophes* (Paris 1975), 290. La Pérouse's instructions are to be found in vol. I of Louis Antoine Milet-Mureau (ed.), *Voyage de La Pérouse autour du monde* (Paris 1797), 4 vols.

[55] Frank Debenham (ed.), *The Voyage of Captain Bellingshausen to the Antarctic Seas 1819–1821* (London 1945), 2 vols., I: 1–3 and 12–29; quotation: 19.

[56] Baudin 2000 (note 34), 75 (quotation), 79 (quotation) and 99. On the relative importance of anthropological research versus political goals in this expedition, see Jean-Paul Faivre, *L'Expansion française dans le Pacifique de 1800 à 1842* (Paris 1953), 106–113, and Jean-Luc Chappey, *La Société des Observateurs de l'homme (1799–1804). Des anthropologues au temps de Bonaparte* (Paris 2002), 280.

ethnology and is "recognised today as a classic of social anthropology".[57] This is Joseph-Marie Degérando's booklet *Considérations sur les diverses méthodes à suivre dans l'observation des peuples sauvages* (Paris 1800, published by and written for the Société des Observateurs). From the point of view of the present study, it is of particular interest because it insists that the ultimate goal the study of savages serves is the promotion of global education. To be sure, this is also the point of François Péron's argument for the Baudin expedition and the primacy of its anthropological focus, in his 15-page brochure *Observations sur l'anthropologie* (Paris 1800).[58] For Péron, however, the greatest benefit of the study of the "barbarians", of "their moral and intellectual qualities, . . . their dominant passions [and] ways of living", consists, in somewhat starry-eyed Rousseauan fashion, in providing an antidote to the evils of European civilisation. This antidote is the closeness to nature of "people less civilized" who are more in touch with their "instinct" than the "degenerate and depraved man in society" (3, 4, 7, 9, 10). Degérando, in his 57-page *Considérations*, is rather more sophisticated, though no less enthusiastic about his project.

His overall guiding principle is Pope's "The proper study of mankind is man"; "the wise man is one who knows himself well" (1). The "philosophical traveller" [voyageur philosophe, 4] achieves that end by observing others and comparing himself to them, thus arriving at "general laws" of human nature (2). The others are to be of "different degrees of civilisation" (3), but it is especially "the savages peoples . . . from whom we can learn" [objet d'instructions pour nous-mêmes, 4]. True, *la mission civilisatrice* does enter into this (5), counterweighed, however, by "our [European] corruption" (56): neither European civilisation nor the savage life are perfect. But the main thrust of the argument is that Europeans now need to learn what they do not as yet know about these others, namely their culture: their thinking and their "moral habits", their *mœurs*, ideas and passions, their laws and social organisations, their moral and religious convictions (7–9). Degérando then proceeds to list, on no less than forty pages, what exactly needs to be done, in the field, to gain this knowledge—a comprehensive anthropologist's and ethnologist's questionnaire or guide to the observation

[57] François Péron, *Voyage of Discovery to the Southern Lands*, ed. by Anthony J. Brown (Adelaide 2006), xviii.

[58] Both are reprinted in Jean Copans and Jean Jamin (eds.), *Aux origines de l'anthropologie française* (Paris 1978). On the Baudin expedition, see also Joseph-Marie Degérando, *The Observation of Savage Peoples*, trl. by F.C.T. Moore (Berkeley and Los Angeles 1969), 1–58, Chappey 2002 (note 56), 246–292, and Péron 2006 (note 57), xiii–xl.

of the physical, social, intellectual and psychological life of unfamiliar cultures, specifically "savage" ones. The net result of such investigations would be a richly detailed image of the life of the other. And once Western man compares himself critically with this image, thereby readjusting his self-image and thus achieving full realisation of his formative potential, nothing less than a "new Europe" would come into being (55). And not only that. Degérando concludes his booklet with a visionary anticipation of "a new future": a world-wide culture resulting from the mutually respectful and self-critical familiarity of the savage and the civilized. This is a veritable utopia, "a new world", similar to what Georg Forster had envisioned decades earlier:[59] all mankind globally aware, fraternally united, "happier and wiser". "Perfectionnement" triumphing at last over the "égoïsme" prevalent in civilised society as it is (1, 56).

Conclusion

Looking back from the vantage point of our own age—an age that increasingly favours "outward bound" global education over the "inwardness" of classical humanistic *Bildung* (commonly rendered as "self-cultivation")[60]—one cannot fail to see merit in the various endeavours of eighteenth-century scholars to open up new horizons. These endeavours consisted in the accumulation, consolidation and organization of knowledge concerning the non-European world, the transfer of such knowledge within and beyond the republic of letters and the advancement of such knowledge beyond the *status quo*. The most eloquent of these scholars, Degérando, writing, not coincidentally, at the very end of the century, after nearly half a century of "philosophical voyages", shares these endeavours, but he goes one step further, indulging in a glowing vision of a Golden Age of global awareness which creates that universal "happiness" that the age craved like no other. Of this vision some of us today may be sceptical. But who is to say that the eighteenth-century scholars championing global education in their various ways were on the wrong track?

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[59] Forster 1958ff. (note 2), VII: 49–55.

[60] The standard English history of the German idea of *Bildung* is Walter Horace Bruford's *The German Tradition of Self-Cultivation* (Cambridge 1975).

RESEARCH PRACTICES IN THE EARLY EIGHTEENTH CENTURY: THE EXAMPLE OF JOHANN JAKOB SCHEUCHZER

Urs B. Leu

Conrad Gessner (1516–1565), Johann Jakob Scheuchzer (1672–1733), and Albrecht von Haller (1708–1777) are the three great Swiss polymaths of early modern times. All three were trained physicians whose scientific curiosity led them to venture into unknown terrain; all three devoted themselves to exploring the Alps, had extensive networks of correspondents, and attempted, as librarians or by means of their work in library science, to record and organise the exponentially growing flood of contemporary publications. In addition, they participated in ongoing specialised discussions by contributing numerous publications of their own, and owned impressive private libraries.[1] Both Gessner and Scheuchzer were well known to Haller; the intellectual climate in Haller's young years was strongly influenced by the research of Scheuchzer, who died when Haller was twenty-four.[2] Haller studied Scheuchzer's work, in certain cases using it as a basis for his own work,[3] and collected as many as 22 publications

[1] Maria Teresa Monti, *Catalogo del Fondo Haller della Biblioteca Nazionale Braidense di Milano* (Milan 1983–1994), 13 vols.; Urs B. Leu, Raffael Keller and Sandra Weidmann, *Conrad Gessner's Private Library* (Leiden 2008). Only a few individual volumes from Scheuchzer's private library could be retrieved at the Central Library of Zurich [Zentralbibliothek Zürich]. However, the University Library in Basle [Universitätsbibliothek Basel] holds an incomplete catalogue of Scheuchzer's library (Ms K II 7, 461–466) listing around 300 titles, which is being reviewed by the author of the present article in connection with preparations for an exhibition on Scheuchzer in the Zentralbibliothek Zürich planned for 2012. On Scheuchzer's appreciation of books and libraries, see also his "Utopia lecture": Bernhard Milt, 'Johann Jakob Scheuchzer und seine Reise ins Land Utopia', *Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich* 91 (1946), 143–146.

[2] See the most recent publication on Scheuchzer: Simona Boscani Leoni (ed.), *Wissenschaft—Berge—Ideologien. Johann Jakob Scheuchzer (1672–1733) und die frühneuzeitliche Naturforschung* (Basel 2009).

[3] This was the case particularly in his research on Swiss flora; see Luc Lienhard, '"La machine botanique". Zur Entstehung von Hallers Flora der Schweiz', in Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005), 371–405: 384–386. At the same time, however, Haller also emphasised the differences distinguishing his specialised botany from Scheuchzer's broad natural history; see Hubert Steinke and Martin Stuber: 'Hallers Alpen—Kontinuität und Abgrenzung', in Boscani Leoni 2009 (note 2), 235–258.

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by Scheuchzer in his library.[4] The latter comprised a total of 26,000 titles, several thousand of which were slim dissertations.[5] Haller's colleague in Zurich, Johannes Gessner (1709–1790), owned even more than 30,000 items;[6] the two of them possessed probably the largest private libraries existing in the Swiss Confederation at their time.

When browsing through Haller's library, at least two titles that testify to an important archaeological and natural-scientific dispute at the time catch the eye. One was authored by the archaeologist and theologian Johann Georg Altmann (1695–1758) of Bern, the other by Scheuchzer. Both explore the subject of mysterious cubes found in Baden, in the Swiss Canton of Aargau.[7] The nearly one-hundred-year history of research into these objects provides an impressive example of the emergence and subsequent refinement of meticulous observation and empirical methods in scientific practice.

Empiricism and Experimentation

The Baden dice were presumably first mentioned in print in a description of the Lake of Lucerne by Johann Leopold Cysat (1601–1663), an assistant city clerk [Unterstadtschreiber] in Lucerne. He regarded them as a freak of nature, just like fossils.[8] Another early report can be found in the *Speculum Helvetico-Tigurinum* written by the theologian and orientalist Johann Heinrich Hottinger (1620–1667) of Zurich.[9] He, too, recorded the cubes, which he considered to be of stone, as a sport of nature, together with fossils. Three years later, the German baroque poet Sigmund von Birken

[4] This number increases to 25 if publications co-authored or edited by Scheuchzer are included.

[5] Around 20,000 titles have been preserved and are kept at the Biblioteca Nazionale Braidense in Milan. See Monti 1983–1994 (note 1); see also Barbara Braun-Bucher, 'Hallers Bibliothek und Nachlass', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008), 515–526.

[6] See the auction catalogue of Gessner's library: *Catalogus librorum bibliothecae Joannis Gessneri* (Zürich 1798). One copy of this rare catalogue is kept at the Zentralbibliothek Zürich, carrying the call number O 456_4.

[7] Johann Georg Altmann, *Exercitatio historico-critica de tesseris Badae Helvetiorum erutis* (Bern 1750); Johann Jakob Scheuchzer, *Vernunfftmässige Untersuchung des Bads zu Baden, dessen Eigenschafften und Würckungen* (Zürich 1732).

[8] Johann Leopold Cysat, *Beschreibung dess Beruehmbten Luzerner- oder 4 Waldstaetten Sees* (Luzern 1661), 250f.

[9] Johann Heinrich Hottinger, *Speculum Helvetico-Tigurinum* (Zürich 1665), 548.

(1626–1681) described the Baden cubes, without, however, specifying their origins.[10]

Johann Jakob Wagner (1641–1695), an orphanage physician in Zurich, took up the issue again in 1680 and for the first time referred to the cubes as stone gaming dice [Tesserae lusoriae lapideae]. However, like his predecessors, he explained them as being wondrous products of nature.[11] Finally, in 1702, the physician and canon Salomon Hottinger (1649–1716) of Zurich demonstrated convincingly that these objects were man-made gaming devices originating with Roman soldiers stationed in Baden.[12] Scheuchzer stated his basic agreement with this view in 1706. Like Hottinger, he disputed the theory of the cubes being a freak of nature, pointing out that the numbers of dots on opposing faces of the dice always added up to seven. Moreover, the rocks in the vicinity of Baden were of another colour than the dice, and never had one of these objects been found embedded in rock like a fossil. Through close observation and by subjecting them to fire, Scheuchzer, the empiricist, determined without doubt that the dice were made of bone.[13] He was, however, unable to resolve the final question of who might have fashioned them. In the issue of 6 October 1706 of *Beschreibung der Natur-Geschichten des Schweizerlands*, a journal he edited, Scheuchzer discussed the possibility that the dice might have originated with the Jewish residents of Baden or private individuals. He ruled out the first possibility, but in the end could not bring himself to make a clear statement.[14]

In 1717 the above-mentioned Bernese archaeologist Johann Georg Altmann published his interpretation of the much-discussed Baden dice. He understood them to be Roman gaming devices, just as Hottinger had maintained fifteen years earlier; he believed that they were made from bone, but also considered ivory as a possible material. By contrast with Hottinger, he did not attribute them to a Roman legionary camp—on the grounds that no such camp had existed in Baden—but to visitors of the famous thermae of Baden.[15] The archaeologist Johann Caspar Hagenbuch

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[10] Sigmund von Birken, *HochFuerstlicher Brandenburgischer Ulysses* (Bayreuth 1668), 43.

[11] Johann Jakob Wagner, *Historia naturalis Helvetiae curiosa* (Zürich 1680), 329.

[12] Salomon Hottinger, *Thermae Argovia-Badenses* (Baden 1702), 11–17.

[13] Johann Jakob Scheuchzer, *Beschreibung der Natur-Geschichten Des Schweizerlands*, second part, no. 39 (29 September 1706), 153–156: 156.

[14] See Johann Jakob Scheuchzer, *Beschreibung der Natur-Geschichten Des Schweizerlands*, second part, no. 40 (6 October 1706), 157f.

[15] See Johann Georg Altmann, 'Brieff an den Verfasser des Alten und Neuen, betreffend die so genanten Baderwuerffel, welche zu Baden im Argeu gefunden werden', *Altes und Neues Aus der Gelehrten Welt* 4 (1717), 235–254: 242.

(1700–1763) of Zurich, four years younger than Altmann, disagreed with his Bernese colleague in two treatises published anonymously[16] in the journal *Altes und Neues aus der Gelehrten Welt*.[17] Hagenbuch raised doubts about Altmann's theory and advanced the opinion that the dice were no more than 200 years old.[18] Moreover, the author did not exclude the possibility that counterfeiters of antiques had been at work.

In 1718, in the same journal, Altmann published a reply to the objections raised by Hagenbuch.[19] This, in turn, prompted a further contribution by the latter.[20] In the January issue of 1719 of *Sammlung von Natur- und Medicin- wie auch hierzu gehoerigen Kunst- und Literatur-Geschichten*, printed in Breslau only in 1720, this journal's editor, Johann Kanold (1679–1729), published a summary of the scholarly dispute, in which he reported further possible interpretations[21] and which he concluded by pointing out that perhaps the dice were, after all, independent products of nature, given that entire groups of the cubes had been found surrounded by a rock matrix.[22]

Johann Jakob Scheuchzer spoke up in the February issue, briefly describing how he and his brother Johannes (1684–1738) had proved by means of experimentation that the finds referred to by Kanold were counterfeits and that the dice had been placed in the rocks purposely.[23] Such counterfeits were also reported in 1721 by the apothecary Johann Heinrich

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[16] The fact that Hagenbuch was the author of these contributions follows from a comment by Johann Jakob Scheuchzer, quoted in another journal by an anonymous author, probably the editor Johann Kanold; see [Johann Kanold], 'Fernere Nachricht von denen Schweitzerischen Bader-Wuerffeln', *Sammlung von Natur- und Medicin- Wie auch hierzu gehoerigen Kunst- und Literatur-Geschichte* (February 1719) (Breslau 1720), 178f.: 179.

[17] [Johann Caspar Hagenbuch], 'Einiche Reflexionen ueber die Baderwuerffel', *Altes und Neues aus der Gelehrten Welt* 5 (1718), 337–347, and 8 (1718), 535–560.

[18] Ibid., 5 (1718), 344–346.

[19] See Johann Georg Altmann, 'Antwort auf die Reflexionen ueber die Bader-Wuerffel', *Altes und Neues aus der Gelehrten Welt* 6 (1718), 400–438.

[20] See [Johann Caspar Hagenbuch], 'Continuation der Reflexionen ueber die Bader-Wuerffel', *Altes und Neues aus der Gelehrten Welt* 8 (1718), 535–560.

[21] The oddest of these involved a pious priest who was reported to have said that "in the place where these dice were being found, a dice used by the soldiers to divide the coat of Christ had been lost, wherefore God had let so many dice grow forth there as a punishment." See [Johann Kanold], 'Von Schweitzerischen Bader-Wuerffeln', *Sammlung von Natur- und Medicin- Wie auch hierzu gehoerigen Kunst- und Literatur-Geschichte* (January 1719) (Breslau 1720), 57–62: 60.

[22] See ibid., 57–62.

[23] See Kanold 1720 (note 16), 178f.

Linck (1674–1734) of Leipzig. Like Scheuchzer, Linck held the view that the cubes were gaming dice of unknown origin.[24]

In his work of 1732 entitled *Vernunfftmaeßige Untersuchung Des Bads zu Baden*, J.J. Scheuchzer returned to the subject of the dice in passing and wrote that they were being found between the large baths and the town, on the meadow known as *Würffelwiese* or *Stulwiese*. Moreover, he repeated his disagreement with those who maintained that the dice had grown in the ground like minerals.[25]

In 1735 his above-mentioned brother Johannes Scheuchzer once again demonstrated in great detail in a dissertation[26] that these dice could not possibly have been produced by nature. In addition, using a microscope, he proved that they consisted of bone. His work was reviewed in the *Helvetische Bibliothek*, and the anonymous reviewer provided information about other sites where dice of this type had been found.[27]

The discussion about the Baden dice—"of which there is so much talk", as David-Francois de Merveilleux remarked in 1739[28]—remained on Johann Georg Altmann's mind. In 1750 he presented another publication about these controversial objects. In his treatise *De tesseris Badae Helvetiorum erutis* he once again provided proof that the bone cubes were not products of nature but gaming dice that had been used as a pastime by bathing Romans. Finally, in 1754, the philologist Jean-Bernard Michault (1707–1770) suggested that possibly the dice had once been part of a game devoted to a local deity in Baden.[29]

After several decades of discussion and investigation regarding the Baden cubes it was thus an established fact that these objects must have been Roman gaming dice; yet the context of their manufacture and use was still not entirely clear to all scholars. These relics of antiquity continue to be found in Baden to the present day, though no longer in such great a number as in the eighteenth century. The dice were made not only of bone, but also of wood and glass. Modern finds from Baden are no

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[24] Johann Heinrich Linck, 'Von Bader-Wuerffeln', *Sammlung Von Natur- und Medicin-Wie auch hierzu gehoerigen Kunst- und Literatur-Geschichte* (December 1721) (Leipzig and Bautzen 1723), 610–611.

[25] See Johann Jakob Scheuchzer, *Vernunftmaessige Untersuchung Des Bads zu Baden* (Zürich 1732), 39.

[26] Johannes Scheuchzer, *Dissertatio philosophica de tesseris Badensibus* (Zürich 1735).

[27] *Helvetische Bibliothek* 1 (1735), 183–190.

[28] [David-Francois Merveilleux], *Angenehmer Zeitvertreib in den Baedern zu Baaden, in der Schweitz, zu Schintznach und Pfeffers* (Danzig 1739), 256. This work appeared in French and in German within the same year.

[29] Jean-Bernard Michault, *Mélanges historiques et philologiques* (Paris 1754), vol. 1, 82f.

longer associated with visitors of the thermae but with legionaries stationed there, as Hottinger had already proposed in 1702.[30]

This century-long preoccupation with the Baden dice may strike us as strange today, but it is typical of the seventeenth and early eighteenth centuries, during which scholars struggled harder than ever before to explain minerals, fossils, and other objects dug from the ground, and throw light on how they came into being. The different views reported above, from popular mysticism and the theory of nature playing tricks to a more modern understanding, show the broad range of lenses through which archaeological, mineralogical and palaeontological objects were viewed in early modern times. Johann Jakob Scheuchzer of Zurich played a central role in demythologising fossils and, not least, the Baden dice as well. The interpretations advanced throughout the course of more than a century reflect the status of knowledge at the time; but they also illustrate how the enlightened, historical-critical way of looking at the world slowly took shape and was trained on concrete objects.

The Museum as a Laboratory

A further publication by Scheuchzer that can be found in Haller's library is his *Museum diluvianum*, printed in 1716, in which he documented his collection of minerals and fossils, with the minerals simply listed by quantity on one barely filled printed page. It appears that Haller was interested in this inventory, which follows pre-Linnaean methods of classification and is possibly the first printed attempt to systematically describe and access a palaeontological collection based on criteria of classification.[31] The modernness of the catalogue becomes particularly clear when it is compared with the inventory of the cabinet of curiosities [Kunstkammer] in the Zurich city library,[32] which Scheuchzer had drawn up from 1698 to 1702.[33] While he classified the fossils in the city collection only roughly

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[30] See Hans Widmer, *Römische Welt. Kleine illustrierte Kulturgeschichte* (Biberstein 1994), 136; Caty Schucany, *Aquae Helveticae. Zum Romanisierungsprozess am Beispiel des römischen Baden* (Basel 1996), 150.

[31] See also Urs B. Leu, 'Johann Jakob Scheuchzer als Paläontologe', in Boscani Leoni 2009 (note 2), 89–106. On natural history collecting activities in early modern times, see the following important volume: Andreas Grote (ed.), *Macrocosmos in Microcosmo: Die Welt in der Stube. Zur Geschichte des Sammelns 1450 bis 1800* (Opladen 1994).

[32] Zentralbibliothek Zürich, Arch St 24.

[33] Rudolf Steiger, *Verzeichnis des wissenschaftlichen Nachlasses von Johann Jakob Scheuchzer (1672–1733)* (Zürich 1933), 35. See also Claudia Rütsche, *Die Kunstkammer in*

and in various cases—for example, in that of the ammonites—did not yet recognise their true character, the *Museum diluvianum* presents itself as a systematic collection catalogue. For the ammonites, which he now correctly placed in close association with the nautili, he devised his own, detailed classification scheme. In identifying and classifying fossil plants he followed the botanical system of Joseph Pitton de Tournefort (1656–1708), and for the crustaceans he consulted the *Amboinsche rariteitkamer* by Georg Eberhard Rumpf (1627–1702) published in Amsterdam in 1705.[34] After Scheuchzer's printed *Museum diluvianum*, the first other collection inventory following a palaeontological taxonomy in Zurich appears to be the catalogue of the *Museum Muraltianum*, which was penned in 1722 by Johann Kaspar Scheuchzer and built on Johann Jakob Scheuchzer's classification concept.[35] The comparable catalogue of the famous fossil collection of the Englishman John Woodward (1665–1728) likewise appeared only years after Scheuchzer's publication.[36]

The polymath of Zurich also attached great importance to accurate designation of origin for each piece wherever possible. He appears to have been particularly interested in fossils from Switzerland, which he designated with an asterisk. His museum, therefore, was not only a systematic collection, but also a collection of specimens of Swiss fossil fauna and flora. This documentary value of natural history collections, which continues to be cultivated to the present day, can also be found in the case of Scheuchzer's contemporary Johann Heinrich Zoller (1671–1763), a member of the city council of Zurich, who after 1709 drew up an inventory of Jurassic fossils he had found at Lägern near Baden.[37] He listed his 200 finds by hand and made a drawing of each of them. These illustrations show that his interest was not limited to particularly beautiful pieces; he seems to have inventoried everything he could find at Lägern. Moreover, he wrote in an introductory note that contributions of further finds from Lägern by

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der Zürcher Wasserkirche. Öffentliche Sammeltätigkeit einer gelehrten Bürgerschaft im 17. und 18. Jahrhundert aus museumsgeschichtlicher Sicht (Bern 1997); Alfred Messerli, 'Was aus der Kunstkammer in der Zürcher Wasserkirche im Laufe des 18. Jahrhunderts wurde', in Benno Schubiger et al. (eds.), *Sammeln und Sammlungen im 18. Jahrhundert in der Schweiz: Akten des Kolloquiums Basel, 16.–18. Oktober 2003* (Genf 2007), 451–470.

[34] Johann Jakob Scheuchzer, *Museum diluvianum* (Zürich 1716), 1 and 18.

[35] This manuscript is now kept at the Universitätsbibliothek Basel, Ms K II 7.

[36] John Woodward, 'An Attempt Towards a Natural History of the Fossils of England', in *A Catalogue of the English Fossils in the Collection of J. Woodward* . . . (London 1729).

[37] On page 6 of his inventory, Zoller refers to Scheuchzer's *Herbarium diluvianum*, which was printed in 1709. Zoller's manuscript must therefore have been written after that date. Zentralbibliothek Zürich, Ms Z VIII 668.

other scholars could lead to an impressive collection of a wide range of varieties from this location, not to mention the collection that could be achieved if this endeavour were continued for the whole of Switzerland.[38]

In Scheuchzer's eyes, the significance of his museum extended beyond taxonomy and location-specific documentation. He also saw the collection as an important means of conveying theological and scientific truths: on the one hand, the fossils testified to God and His terrible judgement over a depraved humanity, and on the other hand, the museum demonstrated that fossils were not some freak of nature but the relics of previously living creatures. Thus Scheuchzer wrote that a visit to his museum had freed many a famous man of preconceived opinions.[39]

According to Scheuchzer's *Museum diluvianum*, at the time of writing he owned 528 Swiss and 985 foreign fossils, as well as 667 Swiss and 1,328 foreign minerals and rocks. A second catalogue entitled *Supplementum ad J. Jac: Scheuchzeri Musaeum Diluvianum* lists 988 additional fossils in his collection. This list exists only as a handwritten manuscript and is now located at the library of the Botanical Garden in Zurich;[40] it carries the ownership inscription "J. Scheuchzer. 1760.", which presumably refers to Scheuchzer's nephew, the medical scientist Johann Jakob Scheuchzer (1738–1815). In total, Scheuchzer thus owned at least 2,501 fossils. Between 1716 and 1723 he attempted to sell the collection for 30,000 French livres, but to no avail.

For his natural history cabinet, Scheuchzer considered fossils not only from Switzerland or from the German town of Öhningen near the Swiss border, but from throughout Europe:

> Thus his collection includes Ordovician and Silurian fossils from Öland and Gotland in Sweden, as well as from England and Bohemia; Devonian fossils from England and the Eifel in the Rhenish Massif; Carbonian from England, Bohemia, Saxony, and Silesia; Permian from Thuringia and Sicily; Triassic from various regions in Germany and from South Tyrol; Jurassic from England (Yorkshire and Dorset), Germany (Swabian and Franconian Jura), Burgundy, Normandy, and numerous Swiss locations; Cretaceous from the island of Rügen as well as various locations in the Swiss and Austrian Alps; Tertiary from Malta, northern Italy, the vicinity of Paris, Bohemia, and the

[38] Zentralbibliothek Zürich, Ms Z VIII 668, 7f.

[39] Johann Jakob Scheuchzer, *Museum diluvianum* (Zürich 1716), Lectori salutem: "Taceo perplures magni nominis viros, qui vel ex conspectu mei Musei a praeconceptis opinionibus fuere liberati."

[40] Bibliothek der Botanischen Institute, collection located directly at the Botanical Garden of the University of Zurich, old call number: 6348; new call number: 3295.

wider vicinity of his home town, as well as from the glacial deposits in the Neckar valley near Stuttgart and in the Zurich Unterland.[41]

Most of Scheuchzer's fossil collection still exists and is kept at the Palaeontological Museum of the University of Zurich. It consists of 1,402 boxes containing one or more pieces each. Many carry hand-written numbers or contain a slip of paper with a number; the numbers refer either to the *Museum diluvianum* of 1716 or to the unprinted *Supplementum ad J. Jac: Scheuchzeri Musaeum Diluvianum*. Almost 80 fossils in the collection have been identified as models for copperplate engravings in Scheuchzer's works. One of them is of particular interest: it shows a fossilised pike from the Miocene strata of Öhningen—the same pike to which Scheuchzer gives extensive voice in his essay *Piscium querelae et vindiciae*[42] published in 1708. In this work, as announced in the Latin title, fossilised fishes lament the fact that they have erroneously been considered to be sports of nature instead of real animals that once lived on earth. The aforesaid pike, by the name of *Lucius antediluvianus*, is their spokesperson. It relates its fate, describing how it lost its life and was buried in the universal deluge—a view that Scheuchzer had taken over from the Englishman John Woodward. Along with the text, Scheuchzer provided an etching in which he documented the animal's anatomical details and thereby demonstrated visually that this object from within the earth could be nothing other than a petrified fish. When comparing the fossil with the drawing it becomes clear that Scheuchzer (or the artist) emphasised certain anatomical elements, such as the head, the spine, and the ribs, in order to underline this fact. Graphic emphasis on the essential structures has until today remained the strength of natural-scientific drawings, which, by contrast with photographs, allow for artistic emphasis or omissions to facilitate better understanding by the viewer.[43]

Based on comparison with living species, Scheuchzer also sought to identify other fossilised sea dwellers depicted in this work as precisely as possible. He used the Öhningen pike and other fish from the same site to shed light on the true nature of fossils, which remained a source of puzzlement and contradictory opinions among scholars for a long time.

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[41] Karl A. Hünermann and Hans P. Rieber, *Johann Jakob Scheuchzer (1672–1733), ein bedeutender Sohn Zürichs* (Zürich 1988), 13.

[42] See the new Latin edition with a French translation: Johann Jakob Scheuchzer, *Les fossiles témoins du deluge*, ed. by Jean Gaudant (Paris 2008).

[43] See Urs B. Leu, 'Streifzüge durch vier Jahrhunderte naturwissenschaftliche Buchillustration', *Librarium* 42 (1999), 78–119.

Fig. 1. Copperplate etching of Scheuchzer's deluge pike from the Upper Miocene in Öhningen, with letter key for anatomical details. Zentralbibliothek Zürich.

Fig. 2. The original Öhningen pike fossil from Scheuchzer's collection. Paläontologisches Institut und Museum der Universität Zürich.

In this respect, it is worth recalling that the physician Karl Nikolaus Lang (1670–1741) of Lucerne, in his *Historia lapidum figuratorum Helvetiae*, likewise published in 1708, still expressed the conviction that fossils were formed directly in the ground.[44] It can hardly be emphasised enough that Scheuchzer, more than any other scholar of the eighteenth century, paved the way not only for the deluge theory, but also for the idea that fossils must be understood as relics of former living creatures.[45] In *Piscium querelae et vindiciae* he provided detailed scientific arguments for his opinion, and, at the same time, laid the foundation for the demythologisation of palaeontology. From there, it was a comparatively small step to interpreting fossils as historical evidence of the history of the earth.

Study of the fossil evidence he had collected led him to believe that the universal deluge had begun in spring. He proved this by means of certain exegetic considerations and three special fossil finds which he depicted in the first volume of his *Kupfer-Bibel*, published in 1731, on Plate 43, as figures I, II, and III. These three pieces consisted of a dragonfly larva from Öhningen, slightly coalified hazelnut shells from a peat or slate-coal horizon, and the tail of a beaked mackerel [Palaeorhynchus glarisianus] from the Landesplattenberg in Engi, Switzerland, which Scheuchzer considered to be an ear of barley due to its peculiar appearance.[46] In his eyes, all three pieces—the dragonfly, the hazelnuts, and the barley—represented stages of growth that can be observed in spring. He wrote:

> A substantial foundation for relics of the universal deluge is given to us by nature, for among those that we seek with great diligence today and have already found plentifully, there are more than a few which prove clearly that this flood began in spring; and although I have presented a still immature ear of barley from my own cabinet along with a description in my Herbario Diluviano, I once again present the learned world with Fig. I; Fig. II. Hazelnuts with still tender, immature shells. From the animal kingdom Fig. III. Dragonflies or 'ear cutters', in the shape in which these insects grow towards their perfection in the month of May; and since the metamorphoses of insects generally shed a great light on this matter; hence these, besides all

[44] Michael Gnehm, ' "Sein Hirn gleich einem Magneten in den Fylspönen". Karl Niklaus Langs Sammlung von Bildersteinen', in Schubiger et al. 2007 (note 33), 379–414.

[45] Michael Kempe, *Wissenschaft, Theologie, Aufklärung: Johann Jakob Scheuchzer (1672–1733) und die Sintfluttheorie* (Tübingen 2003); id., 'Die Gedächtnisspur der Berge und Fossilien: Johann Jakob Scheuchzers Sintfluttheorie als Theologie der Erdgeschichte', in Martin Muslow and Jan Assmann (eds.), *Sintflut und Gedächtnis: Erinnern und Vergessen des Ursprungs* (Paderborn 2006), 199–222.

[46] Heinz Furrer and Urs B. Leu, *Der Landesplattenberg Engi: Forschungsgeschichte, Fossilien und Geologie* (Engi 1998), 40–43.

Fig. 3. Plate 43 from Scheuchzer's *Kupfer-Bibel* (Vol. 1, Augsburg 1731). Zentralbibliothek Zürich.

> plants, most correctly befit the spring-time; these markers and time-pointers, according to the highly renowned author of the Collections of the Royal French Society of the Sciences in 1710, are older, weightier, and more correct than all Greek and Roman coins.[47]

Scheuchzer was one of the first natural historians who used fossils to elucidate and date geological processes. The fossil in his hands became a historical document! This way of thinking is more than familiar to modern palaeontologists. Scheuchzer not only collected fossils, but also tried to read them. The three above-mentioned fossils belonged to his collection and are still kept at the Palaeontological Institute and Museum of the University of Zurich.[48]

Careful observation of objects from his collection also led Scheuchzer to a number of accurate conclusions about animals that were still unknown at that time, such as brachiopods. For example, Scheuchzer correctly noted that brachiopod finds, unlike fossil bivalves, usually included both halves of the shell. It was established later that this is due to their complex hinge mechanism, which prevents the shells from being torn apart.[49]

Scheuchzer's studies of fossils, not least of the Öhningen pike described above, demonstrate impressively how, to him, his collection reached far beyond the Wunderkammern of his contemporaries. It was not a cabinet of curiosities, but a documentation of fossil fauna and flora that aimed at completeness, and it also served to elucidate geological processes. It did not primarily include exotica; every fossil creature was integrated and carefully inventoried.[50] Scheuchzer frequently added notes regarding find-spots, a practice that was not at all common in his day and provides instructive insights into palaeontological sites in his time. His *Museum diluvianum* is an interesting testimony to this important change in the history of science, from collecting out of mere curiosity to collecting

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47 Johann Jakob Scheuchzer, *Kupfer-Bibel* (Augsburg 1731), vol. 1, 58.

48 Urs B. Leu, 'Geschichte der Paläontologie in Zürich', in *Paläontologie in Zürich. Fossilien und ihre Erforschung in Geschichte und Gegenwart* (Zürich 1999), 11–76: 30f.

49 Urs B. Leu and Heinz Sulser, 'Fossile Brachiopoden aus der Sammlung von Johann Jakob Scheuchzer (1672–1733) auf dem Hintergrund der frühneuzeitlichen Paläontologie', *Eclogae Geologicae Helvetiae* 93 (2000), 517–530: 525.

50 Scheuchzer's English correspondent John Woodward pursued the same objectives with his own geological collection. See David Price, 'John Woodward and a Surviving British Geological Collection from the Early Eighteenth Century', *Journal of the History of Collection* 1 (1989), 79–95; see also Michael Kempe, 'The Anglo-Swiss Connection. Zur Kommunikationskultur der Gelehrtenrepublik der Frühaufklärung', in Robert Seidel (ed.), *Wissen und Wissensvermittlung im 18. Jahrhundert. Beiträge zur Sozialgeschichte der Naturwissenschaften zur Zeit der Aufklärung* (Heidelberg 2001), 71–91.

systematically, and it documents the new function of museums as a place of work and research.

This is confirmed when studying the fully preserved geological collection of Scheuchzer's contemporary and correspondent, John Woodward, and the appurtenant hand-written inventories, all of which are kept in the Sedgwick Museum in Cambridge. Scheuchzer sent Woodward 143 rocks and fossils, which the latter carefully inventoried and, in part, briefly commented on. Among the bivalves of the *Spondylus* genus Woodward incorrectly listed a prominently ribbed fossilised oyster with a belemnite stuck on its reverse side. His colleague from Zurich had sent him the piece along with the following description: "*Conchae Fossiles ex Territorio Basiliensi, quae illustrant doctrinam de Belemnitis*". Scheuchzer appears to have believed that the origin of the belemnites was somehow related to these bivalves, or possibly considered belemnites to be individual ribs on the bivalves' shells. Woodward likewise studied the object closely and discerned correctly that the bivalve and the belemnite did not belong together and that their occurrence next to each other in the same piece of rock was a coincidence. He noted the following:

> Part of a large Spondylus, with the Ridges big, rising and round, at last Standing off from the shell in a tubular Form. Sent by Dr. Scheuchzer, with this Title Conchae Fossiles ex Territorio Basiliensi, quae illustrant doctrinam de Belemnitis. By which he seems to believe the Belemnite only parts of this Species of Shells. But a little further Observation would have shown him that was a great Mistake.[51]

As was demonstrated also in the case of the Baden dice, analysis of the same or similar objects of study by different scholars, and critical debate within a network of correspondents, have solved many a riddle, shattered myths, and advanced science.

Emergence and Significance of the Scientific Journal Culture

Cross-border correspondence between scholars, as well as the emergence of scientific periodicals in the second half of the seventeenth century, provided eminently important platforms for scientific discourse.[52] While the

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[51] John Woodward, Woodwardian Museum, Cabinet E, fol. 206v–207r (Sedgwick Museum Cambridge).

[52] See Jeanne Pfeiffer and Jean-Piere Vittu, 'Les journaux savants, formes de la communication et agents de la construction des savoirs (17e–18e siècles)', *Dix-huitième Siècle* 40

piecemeal information contained in letters frequently resembled a quarry, periodicals disseminated scientific information that had been screened by the editors and was thus of high quality. By contrast with printed books, results now no longer flowed intermittently, from monograph to monograph; instead, the periodicity of publication dates guaranteed a regular flow and exchange of knowledge.

Beginning in 1665, with the appearance of the *Transactions of the Royal Society* in England and the *Journal des scavans* in France, the number of newly-founded scientific journals in Europe grew exponentially. These first two journals were followed in Germany by the important periodical *Miscellanea curiosa medico-physica* in 1670; the famous *Acta eruditorum* in 1682; and the first German-language journal, *Monatsgespräche*, edited by the philosopher Christian Thomasius (1655–1728), in 1688. Beginning in 1694 various periodicals emerged in Switzerland, as well, two of which were called into being by Scheuchzer: *Nova literaria Helvetica*, published between 1702 and 1715, and *Beschreibung der Natur-Geschichten des Schweizerlands*, printed as a weekly periodical between 1706 and 1708. *Nova literaria Helvetica* was the first Latin journal in the Swiss Confederation, whereas *Beschreibung der Natur-Geschichten des Schweizerlands* was the second Swiss journal published in German, following *Historischer und Politischer Mercurius* that had been printed in Zurich as of 1694.[53] Scheuchzer included information from his network of over 700 correspondents[54] in both of his periodicals and—like Haller after him—made frequent use of the new medium himself, publishing almost 160 of his 256 works printed during his lifetime in journals.[55]

While the Latin-language *Nova literaria Helvetica* as a review journal was directed at an international scholarly audience, with *Beschreibung der Natur-Geschichten* Scheuchzer attempted to address a broader public on topics from the realm of natural history, with the intention of entering into discussions and scientific exchanges with his readers. In the preface

(2008), 281–300; Martin Stuber, 'Journal and Letter: The Interaction between Two Communications Media in the Correspondence of Albrecht von Haller', in Hans-Jürgen Lüsebrink and Jeremy D. Popkin (eds.), *Enlightenment, Revolution and the Periodical Press* (Oxford 2004), 114–141.

[53] See Hanspeter Marti and Emil Erne, *Index der deutsch- und lateinsprachigen Schweizer Zeitschriften von den Anfängen bis 1750* (Basel 1998), 16–21.

[54] See Rudolf Steiger, *Verzeichnis des wissenschaftlichen Nachlasses von Johann Jakob Scheuchzer (1672–1733)* (Zürich 1933), 49–73.

[55] Ibid., 3–18.

to the first issue, dated 11 February 1705, he explained that it was his desire to make his observations regarding Swiss natural history also

> known to private individuals. To this end, so that I may entertain both scholars and non-scholars, I have resolved to present every week, on half a sheet, with one or several histories of Nature of the Swiss Confederation written in the German language, and to disclose my thoughts on them; but above all to give others an occasion in many regards to correct me in this or that, to improve my opinions, and otherwise to pay closer attention to natural occurrences in our fatherland. As I also entertain the hope that this well-intentioned work of mine will not displease curious minds, and that they shall therefore keep such an unusual newspaper, I have resolved, with the help of God, to produce a proper index towards the end of the year, and enclose it with the last sheet.[56]

At the end of the year Scheuchzer combined these weekly accounts [Wochentliche Erzehlungen]—consisting of half a folio sheet each (i.e. four quarto pages)—in one volume and added an index and a front page with the heading: *Beschreibung der Natur-Geschichten des Schweizerlands*. At the end of the last fascicle of the volume published on 30 December 1705, which comprised a total of 188 pages, Scheuchzer informed his readers of the journal's price: "It serves for further report that a complete copy [= all 47 issues of the entire year] costs 1 Gl. 12 s." One gulden and 12 shillings correspond to 52 shillings. A single issue of this weekly journal thus cost little more than a shilling. This was a price that even artisans and ordinary people could afford—a master bricklayer in Zurich at that time earned for example 17 shilling a day.[57]

Conclusion

Already beginning to unfold in the renaissance art of a Leonardo da Vinci or an Albrecht Dürer, exact observation and description of natural physical objects was refined in the course of the sixteenth and seventeenth centuries. In addition, it was complemented with comparative and inductive methods that helped to correctly interpret controversial objects such as archaeological and palaeontological finds. Natural history collections also played an important role in this task, developing from spectacular

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[56] Johann Jakob Scheuchzer, *Beschreibung der Natur-Geschichten des Schweizerlands*, first part, no. 1 (11 February 1705), 1–4: 1.

[57] Albert Hauser, *Vom Essen und Trinken im alten Zürich. Tafelsitten, Kochkunst und Lebenshaltung vom Mittelalter bis in die Neuzeit* (Zürich 1961), plate in annex.

Wunderkammern into places of scientific research and knowledge generation. Scientific journals as a new medium made it possible for scientists to exchange results rapidly, even across national borders. Empirical-experimental methods, the development of systematic collections, and the establishment of a culture of scientific journals were thus basic elements enabling the seminal natural-historical discourse in the century of Albrecht von Haller.

FACED WITH THE FLOOD: SCHOLARLY WORKING PRACTICES AND EDITORIAL TRANSFORMATIONS AT THE HIGHPOINT OF SCIENTIFIC PUBLICATIONS

Miriam Nicoli

Introduction[1]

What did being a man of science working in the second half of the eighteenth century actually mean as far as his daily life was concerned? Carrying out dissections, rambling in the Alps in search of botanical specimens, conducting experiments with the aid of a microscope, corresponding with the most prestigious Academies, or bleeding or purging a patient: for all these aspects of the scholar's work, artists have provided us with magnificent illustrations, which we can summon to our aid when such a question is asked. But it is less easy to answer this question: what did it mean to be a man of science working at the dawn of the "second revolution of the book"?[2] Artists have indeed painted many pictures of scholars holding large tomes, but these images give us only a static vision, which does not help us to imagine what might lie hidden behind the simple gesture. After setting the context into which they are to be inserted, we propose to show how these portraits fit into the bustle of the scholar's daily life.

The art of printing had scarcely developed in technical terms since the time of Gutenberg, but in the second half of the eighteenth century major changes were influencing the book market and giving a new dynamic to the circulation of knowledge that had been progressing constantly since 1450: the development of important trade and road networks, the introduction of subscriptions, making it possible to raise large sums in capital, and the assertion of new ways to consume the written word. The most

[1] This article was written in the context of the author's doctoral thesis entitled *Les savants et les livres. Autour d'Albrecht von Haller (1708–1777) et Samuel-Auguste Tissot (1728–1797)*, under the supervision of Professor Danièle Tosato-Rigo (University of Lausanne).

[2] French historians speak of three revolutions of the book, the first being the age of Gutenberg, the second between the end of the Ancien Régime and the industrial age, and the third the appearance of information technology. See Frédéric Barbier (ed.), *Les trois révolutions du livre* (Genève 2000).

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striking change is undeniably the spectacular increase in the number of places where books were produced. In the eighteenth century knowledge became a major business.[3] This upsurge, which can be quantified as a threefold rise in production between 1701 and 1770,[4] led to keen competition in the marketplace. It was at this time too that the figure of the industrial-scale publisher started to emerge. In Paris, in 1771, 40 workshops with a total of 317 printing presses were kept continuously busy (not counting the clandestine ones),[5] making the French capital one of the major centres of printing along with London, which, in 1777, had 72 booksellers. Switzerland, too, was experiencing a golden age following the decline of the Dutch. If it had 24 printing workshops in 1700, that figure was to double in less than a century. Five new workshops opened between 1703 and 1711, and sixteen came into being between 1732 and 1792.[6] Statistical research by François Furet has shown on the basis of public licences to print that in France a large proportion of the presses were printing technical or scientific works. Between 1723 and 1788, books in the category of "sciences and arts"—and in particular those on medicine—experienced a considerable increase, at the expense of books on theology and religion.[7] But science books were gaining ground against other types of books as well. From his study of tacit permissions to print,[8] where the proportion of theology is small, Henri-Jean Martin has demonstrated the "gradual replacement of belles-lettres (55 per cent in 1750–1754; less than 40 per cent in 1780–1784) by the arts and sciences (which progress from 25 per cent to about 40 per cent)".[9] Despite the lack of statistical studies for Switzerland, a glance at the catalogues of Swiss booksellers is enough for

[3] Peter Burke, *A Social History of Knowledge. From Gutenberg to Diderot* (Cambridge 2000), 173.

[4] Henri-Jean Martin, 'Une croissance séculaire', in Roger Chartier and Henri-Jean Martin (eds.), *Histoire de l'édition française. Le livre triomphant 1660–1830* (first edn. 1984, Paris 1990), 113–127: 119.

[5] Ibid., 118.

[6] Jean-Daniel Candaux, 'Imprimeurs et libraires dans la Suisse des Lumières', in Robert Darnton and Michel Schlup (eds.), *Le rayonnement d'une maison d'édition dans l'Europe des Lumières: la Société typographique de Neuchâtel, 1769–1789* (Neuchâtel 2005), 52–68: 52.

[7] François Furet, 'La "librairie" du royaume de France au 18e siècle', in id. (ed.), *Livre et société dans la France du XVIIIe siècle* (Paris 1965), 3–32.

[8] Tacit permission was a special privilege granted in eighteenth-century France as a response to the need to soften censure. It allowed for the publication of writing that was avant-garde or indirectly critical of state orthodoxy, and which would not have been granted official royal privilege. A work published tacitly did not carry the royal seal or the name of the censor.

[9] Martin 1990 (note 4), 121.

an intuitive confirmation that the trend here was no different from that observed in France: there were a large number of scientific publications coming off the Swiss presses; Euler, Bernoulli, De Crousaz, Gessner, Pictet, Bonnet, De Saussure, Trembley, Cramer, Tissot, and Haller, to mention no more than them, kept printers and booksellers working unremittingly.

Having outlined this change in production, we must now define what is meant by a scientific publication. The definition of science in modern history was less clear-cut than it is today. In the sixteenth century, philosophy and theology could also have fitted into the category. Nevertheless, in the eighteenth century subjects were becoming more clearly compartmentalised. On this basis we shall classify the natural sciences—physics, chemistry, mathematics, medicine, and astronomy—under the label of science, despite being aware that for this period it is not really possible to make a clear division between astronomy and astrology, physiology and psychology or even philosophy, chemistry and alchemy, and, above all, a science book from a popularising book. It might perhaps seem more sensible to follow Benoît Melançon's suggestion and define the science book in terms of its material characteristics: large format, use of non-textual elements and Latin, large numbers of special characters, aimed at a highly educated public, written by an author whose authority is recognised by an academy or a university, and whose purpose has to do with knowledge and its acquisition, rather than with entertainment…[10] But at a time of change and transition, like the one under study, nothing can be less certain, since the typical characteristics of the "scientific publication" as an object were constantly evolving, as we shall see.

We shall treat this "highpoint of the science book"[11] by looking at the following questions: How did the scholars perceive and relate to this phenomenon? What impact did it have on the working practice of scholars and on the "scientific publication" as an object? Rather than using statistical studies, we have chosen to take scholarly correspondence as our point of entry, where the scholar is simultaneously actor, observer, and critic of this moment. Our aim is to understand the relationship of the scholar to the book in his daily life, and how he perceived the publishing market

[10] Benoît Melançon, 'Qu'est-ce qu'un livre savant?', in id. (ed.), *Le Savoir des livres* (Montreal 2005), 9–42.

[11] Bruno Jammes, 'Le livre de science', in Chartier and Martin 1990 (note 4), 256–268; see also Bernhard Fabian, *Der Gelehrte als Leser. Über Bücher und Bibliotheken* (Hildesheim et al. 1998); Marina Frasca-Spada and Nick Jardine (eds.), *Books and the Sciences in History* (Cambridge 2000).

and the practices of publishers and booksellers. The correspondence will enable us to explore what it meant to "do" science on a day-to-day basis in a way that other sources, such as the learned academies or the publishing houses, cannot. All the more so since as the publication of works expanded and accelerated, the interlinkage between letter and book grew greater and closer.[12]

The exchange between Albrecht von Haller (1708–1777)[13] and Samuel-Auguste Tissot (1728–1797)[14] lends itself well to our purpose. A brief description of the two scholars based on their respective works could amount to the following: the former, a citizen of Bern, was a prolific author whose chief work, the *Elementa physiologiae*, consists of eight quarto volumes totalling about 5,000 pages in Latin; the second, a generation younger, a physician from Lausanne—at that time under the rule of Bern—owes his fame to one of the best-selling medical works of the century, the *Avis au peuple sur sa santé*, a small duodecimo work of 570 pages written in the vernacular. These two works, in some ways antithetical to each other, were two major successes of eighteenth-century medical literature and illustrate the heterogeneity of the genre. We shall use their authors' correspondence, exchanged over a period of over twenty years (1754–1777), and their letters to their publishers and booksellers, as well as to a small network of mutual friends, including Charles Bonnet and Johann Georg Zimmermann,[15] to probe the attitudes and strategies of scholars in the face of this blossoming of the scientific book.[16] But first we shall examine this highpoint in more detail.

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[12] Marie-Claire Hoock-Demarle, *L'Europe des lettres: réseaux épistolaires et construction de l'espace européen* (Paris 2008), 202.

[13] See Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008).

[14] See Vincent Barras and Michelle Courvoisier (eds.), *La médecine des Lumières: tout autour de Tissot* (Genève 2001); Antoinette Emch-Dériaz, *Tissot: Physician of the Enlightenment* (New York 1992).

[15] These are letters exchanged over a length of time or occasionally, often with a practical purpose or of an informal nature. Our interest is focused on writings about ordinary things, with no aesthetic purpose and not addressed to the general public.

[16] See Urs Boschung et al. (eds.), *Repertorium zu Albrecht von Hallers Korrespondenz 1724–1777* (Basel 2002), 2 vols.; Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005); Antoinette Emch-Dériaz (ed.), *Samuel-Auguste-André-David Tissot—Johann Georg Zimmermann. Correspondance 1754–1797* (Genève 2007).

In the Face of the Flood

The sources convey a picture of researchers literally "inundated" by printed works. "The Leipzig fair submerged us in books,"[17] Haller wrote to his colleague Rast de Maupas in Lyon. The practice of reading is described as "never-ending",[18] making it impossible to "digest"[19] what was read and to keep up to date: "I thought I had read a lot," wrote Haller, in an attempt to justify himself, "but I find infinitely more still left to read";[20] "I am besieged by books",[21] he claimed some time later. Continuous purchases of books and periodicals, new or second-hand, testify to the increasing supply of publications on scientific subjects and the acceleration in their production. The ever more widespread practice of translation greatly increased the number of works now accessible to those who did not speak this or that language, or were not comfortable with Latin. If back in 1680 Leibniz had already been dazed by a "horrible mass of books which keeps on growing",[22] a century later a real change of tempo is clearly perceptible in the way scholars juggled their time between their field or laboratory work and the work they did in their studies, reading and studying. Ideally, but with ever greater difficulty, this reading covered the ancient writers at the same time as the mass of modern ones: "Our successors will have a prodigious amount of reading to do",[23] exclaimed Tissot in this connection. Anyone who is even slightly familiar with the learned correspondence of the period knows that almost every letter mentions borrowing this or that book from a colleague, comments on the latest bibliographical review to have appeared on the market, or refers to bookseller's assistants being sent out to the four corners of Europe in the hope of satisfying a list of *desiderata*.[24] And even more often these letters are about "making"

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[17] Letter from Haller to Rast de Maupas, 18 August 1774, in Vernay (ed.), *Correspondance inédite de Albert de Haller, Barthèz, Tronchin, Tissot avec le Dr. Rast de Lyon* (Lyon 1856), 21.

[18] Letter from Haller to Tissot, 15 February 1758, in Erich Hintzsche (ed.), *Albrecht von Hallers Briefe an Auguste Tissot 1754–1777* (Bern 1977), 534.

[19] Letter from Haller to Charles Bonnet, 31 March 1761, in Otto Sonntag (ed.), *The Correspondence between Albrecht von Haller and Charles Bonnet* (Bern 1983), 235.

[20] Letter from Haller to Tissot, 24 March 1768, in Hintzsche 1977 (note 18), 282.

[21] Letter from Haller to Tissot, 2 August 1776, ibid., 452.

[22] Quoted in Richard Yeo, 'Classifying Science', in Roy Porter (ed.), *The Cambridge History of Science*, vol. 4: *Eighteenth-Century Science* (Cambridge 2003), 241–266: 24.

[23] Letter from Tissot to Haller, 26 (September?) 1774, Burgerbibliothek Bern [BBB].

[24] Martin Stuber, Stefan Hächler and Hubert Steinke, 'Albrecht von Hallers Korrespondenznetz. Eine Gesamtanalyse', in Stuber et al. 2005 (note 16), 1–216: 132–135 and

books, because publishing had become imperative in the world of learning. Bringing one's own works to fruition, correcting those of others, writing articles, reviews and pamphlets to defend oneself in polemics, making translations . . . The daily life of scholars was shaped not only by reading, but also by writing. A publication became a visa allowing entry into the great Academies; according to Charles Bonnet, whom Haller asked to recommend Leopoldo Caldani to the Royal Society, sending a good book was worth more than a thousand recommendations, since these had been abused too often.[25] Even young men were pushed into publishing earlier and earlier to gain visibility on the job market. Bachelors of medicine at the University of Montpellier were obliged by decree to publish their theses, whatever their standard, which brought to light works which had previously lain forgotten in drawers. "What a flood of commonplace ideas," Haller was to comment.[26]

The attitude of scholars towards this "information explosion"[27] was ambiguous. They felt they were caught in the crossfire between the necessity of acquiring as much as possible, on the one hand, and the need to identify and condense the knowledge that was truly useful—the fruit of methodologically sound work—on the other; or, to put it simply, they were caught between the comprehensive and the essential. Thus Tissot wrote to Haller:

> I have, Sir, received the first volume of *Bibli[otheca medicinae] pract[icae]* . . . and I see to my sorrow that you intend to mention all the dissertations you are aware of, directly or indirectly, and since one can say without exaggeration that for every 50, 49 are not worth reading, why overburden your volumes and spend your time preserving the memory of hotchpotch efforts that should never have existed at all [?]

Haller replied: "I was not sure about the theses, and a list of names and titles with no content certainly makes for poor reading. But the Germans would condemn me if I omitted the names of these items. The *Bibliothèque* is supposed to be the first step towards a complete Library, and other collections should add to it what I lack."[28]

177–183; Hubert Steinke and Martin Stuber, 'Haller und die Gelehrtenrepublik', in Steinke et al. 2009 (note 13), 381–414.

[25] Letter from Charles Bonnet to Haller, 11 March 1767, in Sonntag 1983 (note 19), 585.

[26] Letter from Haller to Tissot, 6 February 1758, in Hintzsche 1977 (note 18), 78.

[27] Yeo 2003 (note 22), 247.

[28] Letters from Tissot to Haller, 24 April 1776, and from Haller to Tissot, 28 April 1776, in Hintzsche 1977 (note 18), 447.

Symptomatic of this malaise felt by men in the eighteenth century—a malaise[29] we still experience today faced with the ocean of information provided by the *internet*, this "Library of Babel" *à la* Borges, built by the conversion of books into electronic texts—were the plans by the architect Etienne-Louis Boullée for the *Bibliothèque du Roi* [King's Library] of 1785 and the description that the essayist Louis Sébastien de Mercier gave of the same library in the year 2440 in his utopian novel of 1771. If the former envisaged a building in the form of a basilica, with an imposing reading area able to contain the entirety of all the knowledge that had been produced, the latter wrote: "Instead of these four rooms of immense length containing thousands of volumes, I found only a small study where there were several books which appeared to me no less than voluminous." The librarian of this imaginary reading room explains to the astonished Mercier that the enlightened men of the twenty-fifth century have abridged and gathered together everything that is important in order to make it more easily available.[30] In the area of the arts and sciences this process—the act of "gathering together"—gained speed during the second half of the eighteenth century.[31] An example? The Paris *Encyclopédie*, of course, but also several less obvious signs, such as the simple fact that among the works which the Parisian printer Didot the younger told Tissot were "currently in press" on 18 September 1769, we find three science dictionaries.[32] Organising and selecting knowledge became a philosophical issue, but also a practical one, that was central for every intellectual of the time. The alphabetical arrangement of the multi-volume encyclopaedias reflected the new way in which learned men were using them: not as books, but as reference tools.[33] Haller made an active contribution to this movement, collaborating on the Paris *Encyclopédie*, on the one published in Yverdon, and on a new edition of the dictionary by the naturalist Jacques-Christoph Valmont de Bomare, and planning—together with the publisher Fortunato

[29] For some more than a malaise, but rather an actual psychological disease called "information fatigue syndrome". See Daniel Rosenberg, 'Early Modern Information Overload', *Journal of the History of Ideas* 64 (2003), 1–9: 1.

[30] Louis-Sébastien Mercier, *L'an deux mille quatre cent quarante: rêve s'il en fût jamais* (London 1771), 194–223.

[31] This process started at the beginning of the century with John Harris' *Lexicum Technicum* (1704) and Ephraim Chambers' *Cyclopedia* (1728). See Richard Yeo, *Encyclopaedic Visions: Scientific Dictionaries and Enlightenment Culture* (Cambridge 2001).

[32] Letter from Pierre-François Didot to Tissot, 18 September 1769. Bibliothèque Publique de Genève [BGE], Fonds Eynard 1908, 215–217.

[33] Peter Burke, 'Reflections on the History of Information in Early Modern Europe', *Scientiarum Historia* 17 (1991), 65–73: 70.

Bartolomeo De Felice—a *Dictionnaire universel de médecine*.[34] If bringing together knowledge of a general type was a first step, the second was to classify it by discipline. The scholars of the eighteenth century were confronted with the increasing fragmentation of knowledge. The titles of the encyclopaedias, but even more those of the printed periodicals, are a good indication of this: in the second half of the century not only were these journals multiplying at a frantic rate, but their titles (*The Mathematician*, 1745; *Chemisches Journal*, 1778; *Magazin für Apotheker*, 1785; *Der Arzt*, 1795) show that they were aiming at a more and more specific readership.[35]

At the same time, the same scholars were feeling the need to clear the "dross" from the field of knowledge and to contain the flood caused by the mass of works pouring onto the market whose foundations were not always solid. Methodology is certainly at the centre of the debate. To use Haller's words: "There are two classes of scholars; there are those who observe, often without writing; and there are also those who write without observing. It is impossible to increase too much the first of these classes, nor perhaps to reduce too much the second. A third class is worse still, those who observe badly."[36] Tissot was more categorical:

> I groan at the state in which the sciences find themselves in this fine kingdom [France]. Genius is unknown, knowledge unheard of, wit is becoming rare, taste has been degraded; they are only interested in trivialities. The titles alone of their output are enough to prove how decadent learning has become: shortened versions, simplified methods, portable dictionaries, pocket atlases, keys to science, tables and almanacs. If the boldest among them risk a slightly less banal title, the very first page sinks back to the level of the others.[37]

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[34] See Nathalie Vuillemin, 'L'écriture encyclopédique d'Albrecht von Haller', in Jean-Daniel Candaux et al. (eds.), *Albrecht von Haller zum 300. Geburtstag. Schweizerische Gesellschaft zur Erforschung des 18. Jahrhunderts*, Themenheft 1 (2008), 77–96; Alain Cernuschi, 'Le corpus des articles encyclopédiques de Haller: établissement définitif et histoire de la rédaction', in Candaux et al. 2008 (note 34), 97–107; Martin Fontius, 'Die Encyclopédie d'Yverdon im Spiegel der Anzeigen Albrecht von Hallers', in Jean-Daniel Candaux et al. (eds.), *L'Encyclopédie d'Yverdon et sa résonance européenne. Contextes—contenus—continuités* (Genève 2005), 385–399; Hubert Steinke and Claudia Profos, *Bibliographia Halleriana. Verzeichnis der Schriften von und über Albrecht von Haller* (Basel 2004), 89–113; Erich Hintzsche, 'Albrecht von Hallers Tätigkeit als Enzyklopädist', *Clio medica* 1 (1966), 235–254.

[35] See Jeanne Peiffer and Jean-Pierre Vittu, 'Les journaux savants, formes de la communication et agents de la construction des savoirs (17e–18e siècles)', *Dix-huitième siècle* 40 (2008), 281–300: 284.

[36] Letter from Haller to Charles Bonnet, 5 January 1759, in Sonntag 1983 (note 19), 153.

[37] Letter from Tissot to Haller, 24 May 1760, in Geneviève Minder-Chapuis, *Auguste Tissot: sa correspondance avec A. de Haller et ses œuvres durant la période 1754 à 1761*, dissertation in medicine, University of Bern, 1973, 126.

His assessment would be confirmed a few years later: "It is not only in this country [France] that the sciences are losing; the scarcity of good books shows that the misfortune is general."[38]

So the highpoint of the science book did not necessarily go hand in hand with an acceleration in the production of new knowledge. Printed scientific works, or at least popularising works, were sought out by publishers and had become a potential source of income; they were thus regarded more and more as an item of merchandise. It is hard to see any real desire to transmit knowledge in the proliferation of periodicals which offered nothing but extracts from other journals and which Haller characterised as "parasites".[39] For a gaggle of "petty scholars", mediocre scientists but with a ready pen—people who could be compared with those whom in the field of literature Robert Darnton has called "Rousseaus of the gutter"—publishing popularising works or rearranging someone else's work by adding a few quickly written notes could be an easy way of getting themselves known and, more importantly, of earning money, especially at a time when work as a family physician was not very lucrative outside the large cities. It is worth pointing out that publishers paid authors for their manuscripts or employed salaried writers or translators. At a time when he was still confined to the village of Brugg in Aargau, the physician Johann Georg Zimmermann provided an excellent example of this dynamic. Faced with economic difficulties, and seeing no other way out, he thought seriously about taking up a career as a "quack", in other words, a writer of science books for the general public. He wrote to Haller:

> I wanted to start off (admirably) with a treatise on hypochondria, vapours and melancholy and offer two new and certain remedies for these diseases. . . . The second work of 'quackery' was to be a treatise on impotence and sterility; the third a treatise on the convulsive diseases of children and a reliable remedy to prevent and cure them. . . . After that I shall give up quackery and shall try to show by my treatise on experiment and by other medical works that I can be something quite different from a quack.[40]

Science was fashionable in the eighteenth century. It sold well, particularly popular science, which flooded the market. Even abridged versions,

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[38] Letter from Tissot to Haller, 30 September 1768 (BBB).

[39] Letter from Haller to Charles Bonnet, 15 May 1770, in Sonntag 1983 (note 19), 875. Haller is alluding to the *Journal d'Erlangen*.

[40] Letter from Johann Georg Zimmermann to Haller, 3 January 1760, in Rudolf Ischer (ed.), 'J.G. Zimmermanns Briefe an Haller', *Neues Berner Taschenbuch auf das Jahr 1909*, 257–264.

encyclopaedias, and technical dictionaries, designed specifically to structure and facilitate access to knowledge, by being produced in "portable" formats, inadvertently contributed to a vicious circle which increased the feeling of being drowned in information. An example? The first dictionary of dictionaries came out in 1758.[41] But this over-enthusiasm for scientific works meant that it was not easy, for the working scholar, to find sound literature to support his own work in the race to get published. Between what was comprehensive and what was essential, it was still necessary to locate what was useful.

Keeping One's Head above Water

To be a scholar during the second revolution of the book meant having to handle information—not always an easy task, according to the sources. In the face of this flood of printed works of very uneven quality, reading practices and work strategies changed. If in 1704 Jonathan Swift satirised in *A Tale of a Tub* what he called "index learning"—in other words, the dissemination of abridgements, indices, and the like—proclaiming that this was simply a method for not reading the books in their entirety,[42] half a century later these tools had become indispensable. As Daniel Rosenberg emphasises: "In a world of rapid change, quick access to knowledge becomes as important as knowledge itself."[43] So what were the means that enabled the scholar to gain access to knowledge? Finding works worth reading was no easy task, given the lack of well-stocked libraries and trained librarians—not all libraries could boast of having Leibniz working for them as Wolfenbüttel could…[44] It must be realised that even if "public" libraries—private associations run by important people and often only open to those able to pay a (sometimes high) subscription fee—were evolving at this time, those outside the major university centres were not yet very well stocked, and gave priority to the purchase of works of theology and literature. According to Samuel Engel, who

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[41] Durey de Noinville, *Table alphabétique des dictionnaires utiles en tous arts et science* (Paris 1758).

[42] Example given by Richard Yeo, 'A Solution to the Multitude of Books: Ephraim Chambers's *Cyclopaedia* (1728) as "The Best Book in the Universe"', *Journal of the History of Ideas* 64 (2003), 61–72: 62.

[43] Rosenberg 2003 (note 29), 5.

[44] Haller complained that for his *Bibliotheca* he had had "no help from the public libraries," which had led to gaps in his work. Letter from Haller to Rast de Maupas, 18 July 1772, in Vernay 1856 (note 17), 15.

succeeded Haller as Bern's librarian, even at the end of the 1730s science was not part of the institution's purchasing policy:

> I must admit to you that I do not know if it is the office, or whether you have left behind in our Library something of your ardour for the sciences, but I have recovered so much taste for the sciences; were it not for the scant attention that is paid here to expanding the sciences in general and the Library as a whole, which somewhat disgusts me, I would devote myself to the sciences entirely.[45]

Ten years later, the results of his efforts to increase the number of scientific books would be disappointing: "I cannot persuade the Commission to buy more books on medicine; I shall make another attempt today…"[46]

Young students and experienced scholars sometimes had to feel their way blindly in order to come upon good reading material. "I have just acquired from Germany 65 large volumes of theses; I am much afraid that there will be a hundred losing tickets for one winning one," wrote Tissot gloomily.[47] It was to him that Jourdan de le Cointe, a student at Montpellier, wrote, drowning in the sea of medical literature and looking for a "reliable route". "What study plan ought I to make for myself, and who are the basic authors that I could use to gradually steer my way so as to profit from it [?]" He continues in critical vein: "There are so many described as Most Excellent and so few that are Good…"[48] Tissot's reply is a detailed *vade mecum* of what to read depending on the branch involved and the stage reached: about eighty works to be studied in three years, without counting the periodicals.[49] It was a concentrated programme—and all the more so because scholars practised "double reading"; on the one hand extensive, not because they were carried away with Goethe-style *Lesewut* or reading mania, but because it was essential in order to stay on top of the subject, and on the other hand intensive, not because the corpus was limited—quite the opposite—but because reading required study. "Read and re-read," Tissot advises the young student. Learning to read well, to evaluate and to memorise what they had read became central to the education of new scholars. Since the Middle Ages, several authors

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[45] Letter from Samuel Engel to Haller, 1 May 1737 (BBB); on Samuel Engel as librarian, see the contribution by Thomas Sander in this volume.

[46] Letter from Samuel Engel to Haller, 3 January 1742 (BBB).

[47] Letter from Tissot to Haller, 21 [October] 1772 (BBB).

[48] Letter from Jourdan de le Cointe to Tissot, 26 August 1776. Bibliothèque Cantonale et Universitaire Lausanne [BCUL], *Fonds Tissot*, IS 3784/130/1, 29–30.

[49] Letter from Tissot to Jourdan de le Cointe, 15 October 1776. BCUL, *Fonds Tissot*, IS 3784/130/1, 48–52v.

had reflected on the argument proposing handwritten indexing systems to be drawn up while reading, or methods for managing basic ideas. In the Renaissance, these note-taking systems were made even more structured. But if, in an ideal world, the learned man was supposed to follow such practices, in his everyday work in the period of the second revolution of the book the scholar did not always have time to apply them, since they were strict and constraining. In this period practically no man of science earned his bread solely from his intellectual production. Most combined their studies with practising medicine, teaching, or political duties, which left little time for intellectual activity. Scholars complained of this: dividing up their time was detrimental to their intellectual activity and the smoothness of their writing. It was thus important to make the best use of time.

So in the face of the flood, it was necessary to be pragmatic. What reading practices were open to scholars? Tissot, who claimed on several occasions that months had gone by without him finding time to read, admits that if when one is young it is instructive to make extracts, "later it is enough to make this a mental summary";[50] Haller, for his part, although he had been an advocate of critical summaries of books since 1725, admitted to Tissot that his reading practice was so specialised and that he had been accustomed to reading so fast, finding almost instinctively the passages that that could be useful to him for his current research, that it was hard for him to read a work in its entirety, word for word.[51] Faced with the huge amount of reading to be done, of material to grasp, and with the vast range of his research, Haller—who defined himself as being "little given to meditation"—managed his activities by dividing all his studies into "an infinite number of different parts. The more difficult the material is, the smaller I make the part, until I can see the whole of it at a glance . . ."[52]

In such a context, where the scientific publication had become less and less a collector's item and was developing into a working tool, the question of the cost of books became one that scholars could not ignore. As a young man Tissot learned this the hard way. Once he had completed his studies, he did not have enough money to build up a library for himself. So when he was writing his *Inoculation justifiée* (1754), he did not have access

[50] *De la philosophie*, undated. BCUL, *Fonds Tissot*, IS 3784/ 67, 149.
[51] Letter from Haller to Tissot, 9 May 1766, in Hintzsche 1977 (note 18), 234.
[52] Letter from Haller to Charles Bonnet, 5 March 1762, in Sonntag 1983 (note 19), 263.

to an "adequate" medical library, a lack which he said meant that he was unable to write a work aimed at physicians.[53] So it is hardly surprising that when a young student asked his advice, Tissot suggested only books that are accessible in duodecimo and octavo formats. According to Tissot, the layout of a book and the choice of format, typeface and paper were not simply questions for booksellers. For the pragmatic Tissot, making books and journals inexpensive was an issue of public health: it allowed for the "continuing education" of physicians. As physician to the poor of Lausanne, he had come into close contact with surgeons and country doctors and had seen for himself the gaps in their training as well as the difficulties they had in earning a living.[54] He probably had them in mind just as much as students when he encouraged Haller to publish in separate small works his valuable contributions to the encyclopaedias that, he said, "three quarters of all physicians will never read" if they were slipped into such costly works. Other physicians also spoke up for the need to bring down the price of scientific books. The Valaisan physician, naturalist and magistrate Jean-Baptiste Claret requested Haller on behalf of "poor" scholars to bear certain details in mind, such as using small characters, making the best possible use of the page, using abbreviations and above all not including illustrations. The purpose was to avoid having lots of volumes, even if it meant producing a different version for the "wealthy".[55] An outlay of 50 livres for the eight quarto volumes of Haller's *Elementa physiologiae* was a heavy burden on the budget of a general practitioner . . . which goes some way to explain the success of his *Primae lineae physiologiae*, sold in duodecimo format for 1 livre 10 sous, or of Tissot's *Avis au peuple*, the two duodecimo volumes of which cost 2 livres.[56] Compared to the daily salary of a physician to the poor in Lausanne in 1767, which amounted to 1,095 batz,[57] the price of the *Avis au peuple* amounted to approximately 12 days of work, whereas the *Elementa* cost the equivalent of 300 days of work.[58]

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[53] Letter from Tissot to Haller, 22 February 1754, in Minder-Chapuis 1973 (note 37), 15–17.

[54] Tissot, *De la médecine civile ou de la police de la médecine*. BCUL, *Fonds Tissot*, IS 3784/ 66, 162–163.

[55] Letter from Jean-Baptiste Claret to Haller, 3 September 1764 (BBB).

[56] Prices without binding charged by the bookseller François Grasset of Lausanne.

[57] Tissot received an annual allowance in cash of 100 florins. See Eugène Olivier, *Médecine et santé dans le Pays de Vaud au XVIII^e siècle (1765–1798)* (Lausanne 1962), vol. 1, 124.

[58] As a basis for comparison it should be noted that in 1767 the price of one kilo of bread was 1,36 batz. See Norbert Furrer, *Vade-mecum monétaire vaudois, XVI^e–XVIII^e siècles: systèmes et parités monétaires, cours d'espèces, prix, revenus et dépenses dans le Pays de Vaud sous le régime bernois* (Lausanne 2010), 78–79.

This flood of information and the price of printed works led to the need to have easy access to good reading material. How could this be achieved? One strategy was to keep asking one's discussion partners abroad about the value of the books they said they had read. Other tools were exploited in parallel to the network of correspondents. Catalogues, whether issued by libraries or booksellers, became indispensable. Booksellers started sending them to their customers by post. The catalogues of the major book fairs, headed by Leipzig, were much in demand; since the middle of the seventeenth century they had included periodicals[59]—new tools which had become part of the scholar's work. Catalogues of private libraries, often made public when debt or death resulted in an auction, were also much sought after: rare or out-of-print works might be obtained at low prices. One way not to miss a sale was to follow the death notices of members of the republic of letters; as soon as the death of Paul Gottlieb Werlhof was announced, Tissot wrote to Haller: "Will his library be sold [?] May I beg you for the catalogue if it appears."[60]

However, reading catalogues required a certain background knowledge. For the non-initiated they could sometimes be deceptive. Since the translation market had started to flourish, an alluring title could turn out to be a simple translation, usually badly done to the extent of distorting the sense intended by the author.[61] This translation "war" which broke out during the second half of the century often undermined original works. In order to be the first to bring out a translation, publishers did not hesitate to call on the services of rather unscrupulous "translators" who produced some very dubious renderings, particularly from Latin; they would even claim that the work had been supervised by the author when this was not the case . . .[62]

A work announced as being an expanded version might be very little different from the original. Haller was quick to contact the bookseller Jacques Wettstein when he had news of a "physiologie hollandaise" printed in Amsterdam. Wettstein's answer was that "There is not a single

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[59] Peiffer and Vittu 2008 (note 35), 285.

[60] Letter from Tissot to Haller, 17 August 1767 (BBB).

[61] Haller made the following remark about the translations of his works: "You are very fortunate to have good translators; I have been very unlucky in this regard, except for the little *Primae lineae* of which the German translation is good." Letter from Haller to Tissot, 12 May 1775, in Hintzsche 1977 (note 18), 413. On the subject of translations of Haller's works, see Florence Catherine's contribution to this volume.

[62] Tissot complains of this in his preface to *De la santé des gens de lettres* (Lausanne 1770), VI–VII.

new folio in the whole book; it consists of word-for-word excerpts from authors who have written on the subject, which have been translated."[63] Nor were the catalogues necessarily of much help in choosing a good edition from among the numerous counterfeits or editions enlarged by other authors, who sometimes remained anonymous—a practice which flourished at the time. Buying the "wrong book" could turn out to be risky. For example, the pirated edition of Charles Bonnet's *Contemplation de la nature* and his *Corps organisés* produced in Rouen "teems with errors";[64] and in his book *Elemens de Pharmacie*, the ill-informed Antoine Baumé commits a very serious error when, speaking of Gérard Van Swieten's remedy for venereal diseases, he suggests using sixteen grains of corrosive sublimate (mercuric chloride) instead of the twelve normally mixed with wheat spirit. And yet he prescribed it with "all the more confidence as M. Tissot, in . . . his *Avis au Peuple*, gives the same dosage in No. 91 of his formulae." In fact Baumé had simply been the victim of a bad edition. "He was deceived," Tissot explained. "I gave only 71 prescriptions, and the one quoted by M. Baumé is one of the additions made by the Paris publisher. I did not mention this treatment at all . . . M. V[an] SW[ieten]'s remedy has done a great deal of harm, and corrosive sublimate, the strongest of all poisons, should only be administered with the greatest caution even by physicians."[65]

Prefaces became a way for scholars to control, one might say, the use being made of their writings, and a beacon to guide readers. In his *Avis au people*, for example, Tissot enumerated the different editions and translations, specifying which ones were authorised, which ones he considered close to his text, and openly criticising those which distorted his ideas and which the reader should not trust. Of several translations into the same language, he advised the best. Haller, in order to help his readers find their way around the numerous title pages rightly or wrongly featuring his name, even went so far as to publish catalogues of his official works; he did this also to prevent himself from being attacked over errors which might have found their way into pirated editions, something he claimed had happened frequently.[66] These examples, which might be labelled "consumers' guides" of the Republic of Letters, far from being

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[63] Letter from Jacques Wettstein to Haller, 27 July 1759 (BBB).

[64] Letter from Charles Bonnet to François Grasset, 15 December 1765. BGE, *Fonds Bonnet*, Ms Bonnet 71.

[65] BCUL, *Fonds Tissot*, IS 3784/I/116, 5.

[66] 'Operum Alberti v. Haller Catalogus', *Epistolarum ab eruditis viris* (Bernae 1775), 157.

isolated cases, show how the purchase of books and the business of reading and writing interacted like a set of self-reflecting mirrors, which has to be studied as a whole. This is the case in particular for scholars who, more than other authors, wrote while reading and vice versa. In the field of science, and of medicine in particular, where a simple mistake in the ingredients of a remedy could literally be a matter of life and death and could sink the reputation and the career of the presumed author, the question of how to navigate safely through the ocean of book production was not something to be underestimated. At a time when output was soaring and the number of counterfeits increasing, these problems became more and more delicate for scholars who had to place ever more trust in publishing professionals. As Adrian Johns has put it: "The recognition of printed books as reliable thus depended substantially on prior representations of the Stationers' community as well ordered. Fixity depends on civility."[67]

In addition to the catalogues, help in finding one's way around book production was available in the form of reviews, bibliographies, notes and indexes. Scholarly journals that featured reviews were highly valued, especially those which covered the output of the whole of Europe.[68] As an initial filter of everything that had been produced, their extracts and summaries enabled the scholar to keep up to date with what was going on without being faced with the duty of having to do too much exhausting reading. The work performed by journalists—new and important players in the Republic of Letters, who are difficult to characterise, sometimes scholars (Haller *in primis*), sometimes simply paid hacks—became more and more a kind of substitute for the work previously done by the scholar in his handwritten summaries. In a clear illustration of the change, Tissot, speaking of the scholar's method of work, in particular that part which consists of making extracts from books, claims that "to say what these summaries should be and to say what a journalist should do, is the same thing."[69] That leads to reflections about the role, method and ethics of journalists who henceforth played a key role. Bonnet, for example, complained that the accounts of his books were often written by journalists

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[67] Adrian Johns, *The Nature of the Book* (Chicago 1998), 624.

[68] Ute Schneider, 'Die Funktion wissenschaftlicher Rezensionszeitschriften im Kommunikationsprozess der Gelehrten', in Ulrich Johannes Schneider (ed.), *Kultur der Kommunikation. Die europäische Gelehrtenrepublik im Zeitalter von Leibniz und Lessing* (Wiesbaden 2005), 279–291; Thomas Habel, *Gelehrte Journale und Zeitungen der Aufklärung. Zur Entstehung, Entwicklung und Erschliessung deutschsprachiger Rezensionszeitschriften des 18. Jahrhunderts* (Bremen 2007).

[69] Tissot (note 50), 156.

who did not have the adequate background to understand the material contained in them, nor enough time to think about the works they were to review—factors which could damage his reputation and the dissemination of his books.[70]

Scholars did not hesitate to spend money on journals. But their correspondence shows that the distribution of these reviews was not always easy in more remote places.[71] It was no easy matter, for example, to obtain the *Göttingische Anzeigen von gelehrten Sachen* regularly in Switzerland via the commercial network of booksellers. Both the mathematician Frédéric Moula of Neuchâtel and Johann Bernoulli of Basle complained about this.[72] Similarly, the *Philosophical Transactions*, which were greatly sought after, arrived on the Continent very late after their publication. These delays were often caused or magnified because they were sent by post or via an intermediary; indeed, scholars tried more and more often to help each other out because of the extremely heavy postal charges. According to Haller, to avoid such annoyances, the best thing would be to secure an eager assistant, bookseller or merchant near the major centres of production and distribution.[73] At a period when the science book was flourishing, managing information also meant having good commercial connections.

Bibliographies were also a working tool found more and more often in the hands of scholars. Indeed, Haller with his *Bibliothecae* made an undeniable contribution to the drawing up of a comprehensive catalogue of new medical and botanical knowledge. Both useful and complete, they reflect the author's erudition. But it should be noted that they disappointed the expectations of readers faced with an increase in the production of printed works. The reader is invited to read these huge volumes more or less in linear fashion; it is difficult to target one's search or to go back and forth. It was said of the *Bibliotheca medicinae practicae*: "We possess a treasure we cannot enjoy, for lack of a key to open it"; "since this excellent *Bibliotheca* is arranged only according to the chronological order

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[70] Charles Bonnet to Haller, 19 August 1755, in Sonntag 1983 (note 19), 70; see also Bonnet's preface to the *Contemplation de la nature* (1764).

[71] Martin Stuber, 'Journal and Letter: The Interaction between Two Communication Media in the Correspondence of Albrecht von Haller', in Hans-Jürgen Lüsebrink and Jeremy D. Popkin (eds.), *Enlightenment, Revolution and the Periodical Press* (Oxford 2004), 114–141: 123–124.

[72] Letter from Frédéric Moula to Haller, 8 October 1753 (BBB).

[73] Letter from Haller to Charles Bonnet, 6 March 1767, in Sonntag 1983 (note 19), 334. Quoted in Peiffer and Vittu 2008 (note 35), 286.

of the authors, and, in the tables, in alphabetical order of their names, it is almost impossible to discover which books one can consult about this or that subject, except by chance and very imperfectly."[74] It was thanks to a resolution by the readers that a subscription was launched to find the necessary money to draw up and print an index to the latter. This initiative followed the failure of Haller's personal copyist, the physician Philippe-Rodolphe Vicat, who had suggested unsuccessfully to the publishers that they should add an index. They refused because of the printing costs, which they considered too high for a work that was certainly very useful, but which, by its very nature as a working tool, had had low sales.[75] For printers, the critical apparatus was still a hybrid item. On the one hand, they were worried about the extra costs it generated—titles, indexes, footnotes, cross-references all made the already arduous layout of the pages where they occurred yet more complicated when those pages contained, as they often did in scientific books, intaglio illustrations which had to be printed on a different press. On the other hand, printers were attracted by these aspects of the product that could be exploited as a sales argument.

Indeed, for the scholar at the time of the second revolution of the book, to have a critical apparatus at his disposal—a paratext (detailed title page, prefaces, etc.)—was a major benefit which eased his daily work in many ways. Firstly, in order to protect his intellectual labour, the scholar had to know how to consume correctly, and the only labelling which provided evidence of the origin of the product "book" was the paratext. Secondly, an author who in the paratext of his book could cite the name of another celebrated scholar raised his credibility (and certainly the number of volumes sold…): according to Bonnet, the name of Haller was a "passport…for the general public".[76] Thirdly, this same paratext—especially the notes and the bibliography—were a guide for future research and enabled the reader to test the reliability of the book. Tissot, who had gained a certain margin of manœuvre in the face of publishing professionals

[74] Letter from Joseph-Ferdinand Lex to Haller, 15 July 1777 (BBB).

[75] We have not found exact sales figures for the *Bibliotheca medicinae practicae*, which, like the *Bibliotheca chirurgica*, was published by Niklaus Emanuel Haller in Bern and Johannes Schweighauser in Basle. But sales of the *Bibliotheca botanica* and the *Bibliotheca anatomica* were disastrous; more than 1,200 copies remained unsold in April 1773 for the two volumes of the former which came out between 1771 and 1772. The publishers informed Haller that they were no longer interested in the other volumes, being worried both about unsold copies and the possibility that Haller might die. Letters from Orell, Gessner, Füssli & Co. to Haller, 28 April 1773 and 8 May 1773 (BBB).

[76] Letter from Charles Bonnet to Haller, 6 February 1759, in Sonntag 1983 (note 19), 154.

thanks to the success of his books, did not give in to editorial demands and preferred to keep an extensive critical apparatus in order to respect the intellectual property of the authors whose ideas he borrowed, and to guide his readers.[77]

Of course index and notes were not an eighteenth century invention; the humanists of the Renaissance as well as the schoolmen of the Middle Ages had already had recourse to the same practice. But what needs to be studied is not so much these items themselves, which were traditionally reserved for theological or historical texts, but the demand for this kind of tool in the area of the sciences. If it is true that the first indexes of scientific works appeared at the end of the fifteenth century in herbariums in order to list the names and diseases of plants, it is important to note that these were alphabetical indexes, and sometimes only rudimentary ones. The rise of the science book encouraged the creation of systematic indexes, allowing targeted cross searches. More generally, the blossoming of scientific publications prompted scholars to see the classification and organisation of knowledge in a different way. Although selective, the following two examples illustrate this need, as well as the importance of "knowledge management": on an individual scale, Haller's productivity was certainly facilitated by the rigorous management of the catalogue of his huge library;[78] on a broader scale, the library in Göttingen owes its fame not just to the quality and quantity of its collection, but also to its *Realkatalog*, a precious instrument in 208 folio volumes produced in 1755, of which a French traveller wrote: "It is unbelievably complete, such that one may not only easily find a book, but at the same time one may discover straight away what this or that author has written."[79] This was the atmosphere in which the catalogues of libraries developed from simple

[77] Samuel-Auguste Tissot, 'Préface', in id., *De la santé des gens de lettres* (Lausanne 1775), X. Swiss scholars often criticised their French counterparts over the lack of critical commentary in their work. This echoes the views advocated by Haller and Tissot on the methodology of scientific work.

[78] See Maria Teresa Monti (ed.), *Catalogo del Fondo Haller della Biblioteca Nazionale Braidense di Milano* (Milano 1983–1994), 13 vols.; Urs Boschung, '"Mein Vergnügen . . . bey den Büchern". Albrecht von Hallers Bibliothek—Von den Anfängen bis 1736', *Librarium* 38 (1995), 154–174; Barbara Braun-Bucher, 'Hallers Bibliothek und Nachlass', in Steinke et al. 2008 (note 13), 515–526: 515–518.

[79] *Gazette littéraire de Berlin ou le Conservateur* 12 (1792). Quoted in Anne Saada, 'La communication à l'intérieur de la République des Lettres observée à partir de la bibliothèque universitaire de Göttingen', in Schneider 2005 (note 68), 243–254: 243.

lists of books drawn up on the visual basis of their physical location on the shelves, to lists based on rational and virtual logic.[80]

Conclusion

When examined closely, the portrait of the scholar at work during the second revolution of the book is anything but static. The highpoint of the science book with its flood of printed material of all sorts brought about a real change in tempo and shows us scholars regularly confronted with issues of publishing and bookselling. The result was that not only compilations, reviews, notes, catalogues, bibliographies and indexes, but also journalists, clerks and librarians became helpers without whose support scholars would have been lost.

It is true that the correspondence does not always tell us in detail about how the scholars felt when confronted with this flood, nor about the choices they made on how to manage the related challenges. Often it simply suggests impressions, to be looked for in letters crammed with other topics, of forthright assertions that need to be read against the backdrop of the methodological diatribes that were vexing scholars, and of the rivalries within a Republic of Letters that was becoming ever more aggressive and competitive; where to call someone a "compiler" was to insult him.[81] The individual practices of information management often remained a personal matter closely dependent on the work being done and the type of responsibilities held. Nevertheless, the correspondence has enabled us, in a way that a quantitative study would not have, to enter the daily life of scholars, showing us, on the one hand, a number of emerging problems arising from the success of the sales of science publications, in particular the problems of counterfeits or new editions augmented without the author's consent. This raises a whole area we only touched upon, and which deserves more sustained attention: the reliability of the knowledge contained in the books. On the other hand, this study has brought out a range of practices, demands and strategies adopted by scholars to "keep their head above water", ranging from participation in projects for encyclopaedias, to the realisation that the structure and

[80] William Clark, 'On the Bureaucratic Plots of the Research Library', in Frasca-Spada and Jardine 2000 (note 11), 190–206: 201.

[81] Albinus wanted to wound Haller, his former pupil, by applying this label to him. Letter from Haller to Charles Bonnet, 3 January 1763, in Sonntag 1983 (note 19), 312.

critical apparatus of books needed to be rethought, or even that the flood of scientific literature could no longer be brought completely under control. Among all this, one fact stands out clearly: ever since the second half of the eighteenth century—a decisive turning point in that it undermined for ever the foundations which made the scientific book the best way of disseminating knowledge on a wide scale—the evolution of research has no longer been thinkable without an effective system of knowledge management, fully mastered by the scholar.

PART FIVE

OBSERVING AND EXPERIMENTING: THE PRODUCTION OF KNOWLEDGE

PRESENTATIONS AND REPRESENTATIONS OF EXPERIMENTAL PERFORMANCES. THE SPREAD OF THE DISPOSITIF OF EXPERIMENT ACROSS PRACTICES, APPARATUSES, AND ARCHITECTURES AT THE UNIVERSITY OF GÖTTINGEN IN THE EIGHTEENTH CENTURY

Gunhild Berg

Since the so-called Scientific Revolution of the seventeenth century, experimentation has become the leading method in scientific practice.[1] The new experimental culture was grounded in a specific kind of evidence that was no longer obtained primarily by understanding a consistent set of reasons but by observing a natural or experimental phenomenon. Moreover, experience based on observing processes replaced a culture of continually archived knowledge contained in books. In contrast to readily accessible written knowledge, experiments became the basis of a new type of science that focused on process-related phenomena, i.e. on change. Such momentary phenomena are not always available for observation. Instruments, as well as the observer, must be prepared before phenomena can be observed. For instance, the astronomer has to arm the eye.[2] Consequently, it was necessary to develop new ways of harnessing these changes. In order to report on such fugitive events, both new and traditional vehicles, such as descriptions and journals, were used. Illustrations, for example in textbooks, became more important for showing experimental apparatuses and procedures that can be perceived only aesthetically. But there were more ways of presenting and representing experimentation that took centre stage among the new empirically based sciences.

Following Michel Foucault's concept of dispositif, this article investigates the history of experimentation by assuming that experimental practices govern ways of perception and recognition as well as discourses and maneuvers by hand, institutional structures, and architectural

[1] Shapin describes the beginning of "the reformed practices of making observations and constituting experience in a wider range of sciences". Steven Shapin, *The Scientific Revolution* (London and Chicago 1996), 12.

[2] Under the assumption that an experiment is about capturing fugitive phenomena that are naturally or technically provoked, I consider observations to be experimentations, as well. Moreover, since Galileo Galilei, astronomy is arguably counted among the experimental sciences due to its technical and operative requirements.

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constructions.[3] I argue that the new experimental method and its practices not only influenced rules of argumentation and limitations of thought, texts and discourses. Above and beyond ways of propagating, telling, thinking and writing, they also structured actions, procedures, and constructions meant to capture the fugitive event provoked by experimentation. They became *manifest* in argumentative figures in texts, lectures and practical training. They also became arguments *cemented* in the architecture of laboratories and other buildings.[4] In this way, they impacted the character of texts, objects, and humans.

As a fugitive event, the experiment is almost always absent. The experimental process is present as long as it is on the stage. Its surroundings, instruments, labs and other objects are conditions as well as residuals of the experimental process. In this conceptualization, experiments are presented and represented with these objects. In order to capture the experimental proceeding, experiments can recur through repetitive presentation or may be stabilized by representation. First, the experimental process can be replicated as often as possible by repeating the experimental action. This is one reason why training of subsequent experimenting generations became professionalized and standardized.[5] People rehearse experimental practices through training in lecture halls and laboratories specifically built to optimize teaching and assimilation of these practices. Second, devices and buildings constructed for conducting and observing experiments represent experimentation. Magnificent instruments and institutes not only show the experimenters' social ambitions; in addition, their' tools express their epistemic ambitions by representing the new experimental method. Apparatuses and other objects may even replace experimental processes that have been carried out and, even more important, that can be repeated every time by using them. By contrast with memorials, they are more than monuments to singular events in the past

[3] For Foucault's concept of dispositif, see 'Le jeu de Michel Foucault', in Michel Foucault, *Dits et Écrits 1954–1988*, ed. by Daniel Defert and François Ewald (Paris 1994), vol. 3, 298–329: 298ff.

[4] How the modern disciplinary power corresponds to the architectural structure of Jeremy Bentham's Panopticon is analyzed in exemplary fashion by Michel Foucault, *Surveiller et punir. Naissance de la prison* (Paris 1975).

[5] I consider that the absorption of experimentation practices is a seminal part of bequeathing a specific "thought style" [Denkstil], cf. Ludwik Fleck, *Entstehung und Entwicklung einer wissenschaftlichen Tatsache. Einführung in die Lehre vom Denkstil und Denkkollektiv*, ed. by Lothar Schäfer and Thomas Schnelle (Frankfurt/M. 1980).

because experimental objects signify their users' potential to replicate the experiment at any point in the future.

Experimental practices are derived from experience and successful operations. By contrast with practical knowledge that was traditionally passed on as an exclusive heritage from one generation of technicians and craftsmen to another, scientific experimental practices represented commitment by several institutional collectives, subjects, and manners. Starting at the new research academies and universities in the Enlightenment period, where the experimental method and practices were discussed, they began to cover all scientific fields and reached new social areas and groups: The experiment first invented as a research tool was established as a method in more and more fields of research. It subsequently became an explicated theoretical teaching subject. Experiments were reported and instruments were shown in academic lectures around 1700.[6] Special courses and hands-on experimental lectures became basic training for more and more students and scholars from 1800. Thus, experimental practices were standardized and gradually became normative. New academic disciplines were founded on the experimental method in the late eighteenth century, such as psychology, pedagogy, and sociology. In addition, several fields in the arts such as aesthetics, literature, and theatre adapted the concept of experiment, so that many of them explicitly called themselves "experimental" in the nineteenth and twentieth centuries.[7] The prevalence of this process made the experiment the dominant instrument of modern sciences and arts.

The horizontal dissemination of the experimental method in almost every academic group simultaneously complemented its social vertical dissemination. Penetrating theory and practice, it played an important role in popular forums and academic theatres. Scholars as well as travelling experimenters promoted the new experimental culture with their magic or experimentation shows.[8] Due to their visual fascination, these

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[6] For universities on the Continent, see Gerhard Wiesenfeldt, *Leerer Raum in Minveras Haus. Experimentelle Naturlehre an der Universität Leiden, 1675–1715* (Amsterdam, Berlin and Diepholz 2002).

[7] Cf. Gunhild Berg, 'Zur Konjunktur des Begriffs "Experiment" in den Natur-, Sozial- und Geisteswissenschaften', in Michael Eggers and Matthias Rothe (eds.), *Wissenschaftsgeschichte als Begriffsgeschichte. Terminologische Umbrüche im Entstehungsprozess der modernen Wissenschaften* (Bielefeld 2009), 51–82.

[8] The competition between both experimenting groups did not compromise their efficiency in disseminating the experimental method. On this historical rivalry, see Oliver

shows appealed to people of both the upper and lower social classes. Such performances communicated the principles of experimental practices. Popular experimentation books, experimental kits, portable labs, and amusement chests offered coaching as well. As an important effect, more and more people of all social classes became "experienced" in experimental practices by observing or by conducting them. Due to this dissemination process, the experiment became an implicit self-evident argument that informed the modern world view, gaining the status of a dispositif.

Academic research and teaching institutions were the starting point of the experimental culture. They integrated experimental performances and offered appropriate teaching programs. Moreover, they had to provide a mental as well as a material and architectural infrastructure for experimentation. Universities had to restructure their academic curriculum,[9] but they also had to provide instruments, scientific assistance, space, laboratories and other rooms that met the requirements for conducting as well as observing experiments.

The University of Göttingen, founded in 1737, was a seminal university of the Enlightenment period. Georgia Augusta was founded as a utilitarian corporation to educate religious and public servants, to aim for applicable results, and to promote the state of Kurhannover's welfare.[10] It designed a program of experimental knowledge and practices imparted in studies, lectures, training, and laboratories. Its scientific departments showed the overwhelming power of the new dispositif of experiment. To admit the power of this dispositif does not hide the fact that scholars, as a part of these institutions, actually encouraged this process of inaugurating experimental practices, first of all with regard to those academic scientists who acquired and collected the essential apparatuses.[11] Constitutively, promotion by the university administration was also undertaken by a personality as important as Gerlach Adolph von Münchhausen (1688–1770), who took the initiative not least with the professorial appointments he was responsible

Hochadel, *Öffentliche Wissenschaft. Elektrizität in der deutschen Aufklärung* (Göttingen 2003).

[9] Above all concerning the new natural philosophy and experimental physics, respectively, cf. Rudolf Stichweh, *Zur Entstehung des modernen Systems wissenschaftlicher Disziplinen. Physik in Deutschland 1740–1890* (Frankfurt/M. 1984).

[10] For J.D. Gruber's draft, see Emil Franz Rössler (ed.), *Die Gründung der Universität Göttingen (1855)* (reprint, Aalen 1987), 3f.; Ulrich Hunger, 'Die Universitätsstadt Göttingen', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008), 99–118: 100 and 103.

[11] Regarding a professor's private expenses for experimentation devices, see Wiesenfeldt 2002 (note 6).

for. He brought leading scientists to Göttingen, including Samuel Christian Hollmann (1696–1787), Albrecht Haller (1708–1777), Johann Andreas von Segner (1704–1777), and Tobias Mayer (1723–1762), famous figures in the new experimental sciences. He also provided an unusually high amount of equipment in terms of apparatuses and laboratories for that time, in order to reduce the private expenses of the newly employed professors.[12] With excellent starting prerequisites for the empirical and practical needs of the university members, he set the stage for the progress of experimentation.

Ulrich Hunger and Peter Hanns Reill point out that Haller was the main protagonist who installed the empirical method at the young University of Göttingen.[13] There is no doubt about Haller's importance for the new experimental culture of the European Enlightenment.[14] Nevertheless, one cannot trace later experimental activities in Göttingen back to Haller without appreciating the consistent formation of the dispositif of experiment in which he was involved. For it is almost impossible to prove Haller's influence on experimental practices in Göttingen after his sudden departure in 1753. Many of his pupils died prematurely or dropped out of Göttingen,[15] and many of his resident admirers alluded to him but did not specify how he inspired them.

But following Haller's path in Göttingen, one may see that he had a great influence on experimental practices by impacting long-lasting academic structures as well as architectural constructions that expressed experimental ambitions and necessities. People were the driving force that advanced the dispositif of experiment, even unintentionally. Despite conflicts and contentions between the different academic disciplines and their exponents, respectively, the dispositif of experiment proceeded.[16] Individual quarrels as, for example, between Haller and Johann Gottfried Brendel,

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[12] Norbert Kamp, 'Die Georgia Augusta als Neugründung', in id. (ed.), *250 Jahre Vorlesungen an der Georgia Augusta 1734–1984* (Göttingen 1985), 7–29: 17.

[13] Cf. Hunger 2008 (note 10), 109; Peter Hanns Reill, '"Pflanzgarten der Aufklärung". Haller und die Gründung der Göttinger Universität', in Norbert Elsner and Nicolaas A. Rupke (ed.), *Albrecht von Haller im Göttingen der Aufklärung* (Göttingen 2009), 47–69.

[14] Cf. Hubert Steinke, *Irritating Experiments. Haller's Concept and the European Controversy on Irritability and Sensibility, 1750–90* (Amsterdam 2005).

[15] Thus they probably prevented the early emergence of a continuous tradition of animal experimentation. Ibid., 58.

[16] This is why this article aims not to present a detailed chronicle of the University of Göttingen, but to point out certain facts showing how the dispositif of experiment was established. I omit many things that could have been selected for this argumentation, such as the collections of mathematical and technical models, minerals and fossils, and the cranial or nummary collection, which are also worthy of analysis from this perspective.

faded away in a long-term process.[17] Thus experimentation, which was greatly intensified by Haller, was autonomously continued, for instance by Georg Christoph Lichtenberg (1742–1799), who in his hundreds of still existing letters and notes never referred to Haller as an ideal for his own extensive experimental work. However, Lichtenberg is our second exemplary protagonist precisely because of this missing link between both men, which demonstrates the spread of the dispositif of experiment at the University of Göttingen.

Stages for Presentations of Experiments

Johann Wilhelm Albrecht (1703–1736), the first professor of medicine in Göttingen, had to do his anatomical work in a fortification tower in a former city wall next to the Albani town gate in the eastern part of Göttingen. When Haller arrived in 1736, the first theatrum anatomicum was built especially for his use.[18] Pütter, the oldest historian of the University of Göttingen, describes five large rooms in this new building designed specifically for the needs of an academic anatomist: lecture hall, study room, hall for demonstrations, chamber for preparations, and another study, the so-called injections room.

Evidence from experiments depends on the conditions under which the experimental process is observed. For the universities as pedagogical institutions, it was no less important to guarantee that empirical studies and experimental performances could be observed by their students than to take care of the needs of the experimenting researcher. Haller was famous for his exploratory experiments, but he was also obliged to perform autopsies on bodies in the anatomical theatre. Even though surgeons had medical practices in the eighteenth century, it remained the duty of the professor of anatomy to give theoretical surgery lessons and to demonstrate cuts on a body in practice.[19] Pütter, who aimed to give the University of Göttingen publicity by writing about its history and present state, depicts the hall of demonstrations in detail because this was the

[17] For difficulties and tensions inside the "Göttingen experimental community", see Steinke 2005 (note 14), 52–54.

[18] Haller had previously negotiated the construction of the anatomical theatre and of the greenhouse with Münchhausen, cf. Rössler 1987 (note 10), 362f.

[19] Urs Boschung, 'Praktische Medizin', in Steinke, Boschung and Proß 2008 (note 10), 274–291: 279.

largest and most important room in the new anatomical building from the university's as well as from outsiders' point of view:

> The hall for demonstrations is a quadrangular place 30 feet in length and two floors or 28 feet height. It is arranged in a semi-circle with 7 tiers, so that there is enough room for about 200 people. The demonstration table stands in the middle of the theatre and can be moved in all directions. For illumination the windows give light from all directions and especially from the top, in order to light the theatre without any shadow.[20]

The requirements of watching dissections were met by lighting the room through windows at the top of the hall and by the architectural arrangement of tiered rows as in classical amphitheatres.[21] Traditional architectural forms were used in an eclectic way to determine the best environment for experimentation.[22] This model shows the epistemological condition of visibility. The round and rising arrangement of the tiers secured the best view for everybody because it reduced the distance from the demonstrator's hand to all observers' eyes. Obviously, this architectural structure succeeded because Göttingen's second anatomical theatre was built on a similar floor plan in 1829.[23]

It was part of the structural improvement to build Haller's living place next to his working place, as he requested.[24] His residential building, anatomical theatre, and botanical garden together made one ensemble fenced by the bricks of the buildings on one side and the town wall on the other side. Haller was supposed to spend most of his time there, merging his life with his work.

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[20] Johann Stephan Pütter, *Versuch einer academischen Gelehrten-Geschichte von der Georg-Augustus-Universität zu Göttingen* (Göttingen 1765, 1788 and 1820), vol. I: [1736]–1765, vol. II: 1765–88, vol. III: 1788–1820, here I: 233 (translated by G.B.).

[21] For similarities of anatomy and theatre, see Stefanie Stockhorst, 'Unterweisung und Ostentation auf dem anatomischen Theater der Frühen Neuzeit. Die öffentliche Leichensektion als Modellfall des theatrum mundi', in Albert Schirrmeister (ed.), *Zergliederungen. Anatomie und Wahrnehmung in der Frühen Neuzeit* (Frankfurt/M. 2005), 271–290.

[22] The form of the classical amphitheatre or arena was typically used for anatomical auditoriums since the sixteenth century, cf. Gottfried Richter, *Das anatomische Theater (1936)* (reprint, Nendeln 1977), 25f.

[23] It became a science to plan a modern auditorium. This so-called auditoriology defines the distances between the experimentation table and general seating by prescribing the architectural dimensions of lecture halls. For a modern example, see Volker Aschoff (ed.), *Hörsaalplanung. Grundlagen und Ergebnisse der Auditoriologie. Empfehlungen für den Bau von Hörsälen* (Essen 1971), 66ff.

[24] On the inappropriateness of living inside the anatomical theatre next to corpses, see a letter from Münchhausen to Haller written on 27 December 1737, cf. Rössler 1987 (note 10), 367.

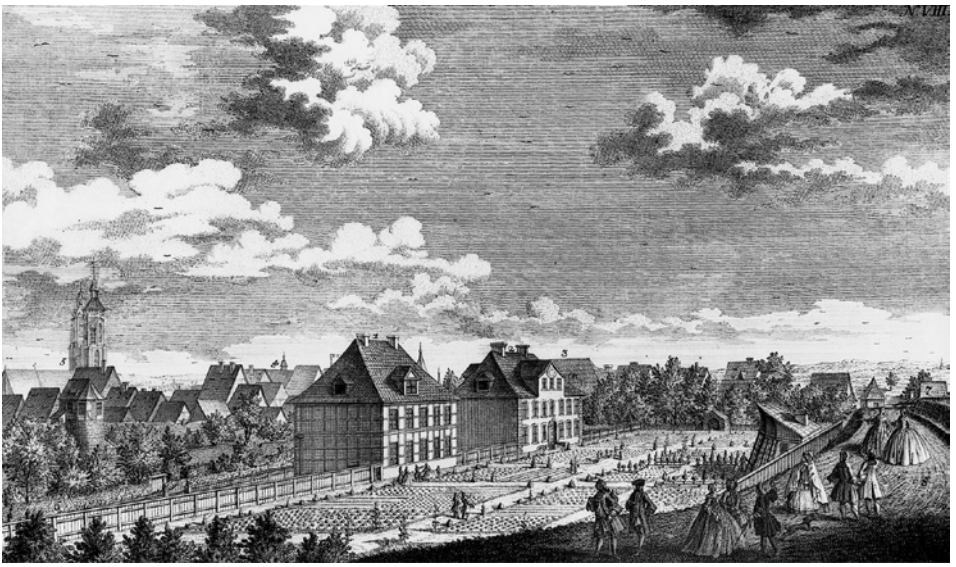

Fig. 1. Botanical garden in Göttingen with anatomy building and Haller's own residence. Frontispiece to Haller's Enumeratio Plantarum Horti Regii et Agri Gottingensis, 2nd ed. (Göttingen 1753).

The infrastructure adapts to the needs of experimental practices by minimizing the distances that the scientist has to cover. The older natural philosopher studied mostly in the place where he lived. The scholar may have worked in a library or scriptorium inside a monastery, or he may have had a study or a small laboratory in his living place. On the contrary, the modern experimental scientist lives where he works, meaning where the equipment is in order to do experiments. The essential observatory or laboratory may become the centre of an experimenter's life if he is comfortable in it or in an extra building for his personal needs next to it. Making infrastructure more effective means making an investment in more concentrated experimental work.

Because chemistry was not an autonomous discipline in the eighteenth century, it was Haller's merit to suggest an ordinary professorship with remuneration in Göttingen's department of medicine, where he had a duty to lecture on chemistry. The second professor who held this chair was Johann Friedrich Gmelin (since 1778). A public chemical laboratory "for the demonstrative lecture of chemistry" was erected for him in 1783. Gedike reports that it was "comfortable and equipped with abounding tools." In his day, it still seemed noteworthy to him that "in the

same building the respective professor of chemistry has a commodious apartment".[25] Apparently, it was something exceptional that this institute was already built with a laboratory, lecture hall, chamber for instruments on the first floor, and a residence for the director on the second floor. Though this building was improved continually in the 1790s, another even larger one was built in the southern part of the town next to the former Kreuz Church in 1830.[26]

The idea of giving the scientist a place to live within the laboratory due to lengthy operations at night was even part of the plan for the first observatory in Göttingen, finished in 1751, where Johann Andreas von Segner and Tobias Mayer worked. Like the first anatomical theatre, it was established in a former fortification city tower. Pütter writes that "they erected a hall on top of the tower wherein is space for the instruments and for observation. . . . A room below could be used for the comfort of the observer." He regrets that "[t]here was not enough room for an actual apartment."[27] The reason for the inadequate size of both rooms was the growing quantity of instruments that they included: among other things "an astrolabe, several sun dials, different kinds of simple and compound microscopes, telescopes, camerae obscurae, a concave mirror and so on", "a vacuum pump with two cylinders, besides a considerable number of machines that are necessary for different experiments, an electrostatic generator, artificial Knight's magnets with many accessories from England; . . . moreover three tidy models in plaster of Bilfinger's method of fortifying."[28] Experimenters demanded new and larger instruments as well as more filigree instruments. Due to their constant upgrading, more and more space was needed to store them. Growing experimental activities implied a rising desiderata of instruments and a growing need for working space that crystallized during this expanding process of the dispositif of experiment.

Rooms seem to decrease in size not only due to the number and size of instruments, but also due to the increasing number of persons who were interested in experimentation. Pütter explains why all these instruments were kept at the observatory: It was "the place where they can be used and

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[25] Hartmut Boockmann (ed.), *Mehr als irgend eine andere in Deutschland bekannt. Die Göttinger Universität im Bericht des "Universitätsbereisers" Friedrich Gedike aus dem Jahre 1789* (Göttingen 1996), 25.

[26] Georg Benno Gruber, *Naturwissenschaftliche und medizinische Einrichtungen der jungen Georg-August-Universität in Göttingen* (Göttingen 1955), 14ff. and 19f.

[27] Pütter 1765 (note 20), I: 239 (all following quotations translated by G.B.).

[28] Ibid., 242.

shown to strangers most easily."[29] For instruments of observation were not only used but also shown. They were objects of observation along with the phenomena that they made it possible to observe. They were not only presented to students but to visitors, too. Shows such as experimental performances and astronomical observations provided experimental experiences for people outside the academic world. Amateurs (with a certain social status) were invited to accompany experimentations and to exercise observations. Experimental scientists such as astronomers, anatomists, and physicists could act in theatrical fashion. Like stage directors, they were able to direct the spectators' attention to the natural phenomena or the celestial event.

Growing public interest was to be taken into account, for instance concerning the second place that Abraham Gotthelf Kästner (1719–1800) prepared for the needs of his astronomical work:

> Professor Kästner, to whom the observatory was now entrusted [in 1765], enjoys the comfort of a very close apartment. . . . This offers the advantage that celestial events can be easily observed in his apartment by a greater number of spectators because he has his own telescopes and other equipment. Therefore, everybody can be satisfied, including those are not in the way of others who do not know how to observe correctly.[30]

Experienced scholars demonstrated the scientific method of observation to colleagues, students, and non-experts, too. That meant that the laymen not only learned how to keep out of the experts' way but that they also got to know the specific scientific procedures. Moreover, they lived to see the astronomical spectacle as part of an experimental-observing collective of scientists. This joint event was more than the celestial phenomenon itself and rather more than an ordinary form of social entertainment. Even more important, townsmen and scientists shared an experience based on experimentation. In disseminating the experimental method, it is not relevant whether non-academics observe on their own later on or not. What they learn and what they may have circulated is the ambition of the new experimental method as well as some knowledge about how to arm the eye, to manipulate perspective, and to direct one's attention to experimental focusing.[31]

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[29] Ibid., 241.
[30] Ibid., 241.
[31] Ways of gaining relevant experience "had to be controlled, monitored, and disciplined", see Shapin 1996 (note 1), 93f.

Architecture as a Representation of Experiments

Concerning teaching practices, Haller was not able to inaugurate a course in what he called experimental medicine [Experimental-Medicin] at the University of Göttingen, contrary to his intention.[32] This might have strengthened experimental activities enormously. Johann Juncker had already begun bedside teaching for this purpose at the Franckesche Stiftungen in order to reform the medical curriculum at the University of Halle. Haller's model probably was his teacher Hermann Boerhaave, who inaugurated a similar course at the University of Leyden. But Göttingen received only a small, state-subsidized polyclinic under the direction of Ernst Gottfried Baldinger (1738–1804) in 1773 and Georg Gottlob Richter's academic hospital for internal medicine and surgical dressing with only 15 beds in 1781, in order to instruct students how to diagnose, prescribe pharmaceuticals, and operate autonomously.[33] Previously, Johann Georg Roederer (1726–1763) and Rudolf Augustin Vogel (1724–1774) had established consulting facilities for poor patients in order to give practical medical instruction on private initiative. These lessons are considered as having constituted one of the first polyclinics at German universities.[34]

Though Haller strove to promote the experimental sciences, not all later improvements can be traced to him. However, Haller left his mark on later experimental practices through his involvement in the creation of new structures especially for the department of medicine, which were built up in the first years of the university. One of them was the botanical garden laid out in 1736 under his direction. As professor of both anatomy and botany, Haller cultivated an increasing number of species by collecting plants from Switzerland and the Harz region and by swapping seeds via letters.[35] His inaugural lecture in 1736 advised students to study botany empirically and autonomously, without a teacher.[36] The garden was arranged for this purpose: "A student of medicine can become familiar with the external appearance of more than 300 plants that are used in

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[32] Johann Georg Zimmermann, *Das Leben des Herrn von Haller* (Zürich 1755), 273 and Gruber 1955 (note 26), 25f.

[33] Boockmann 1996 (note 25), 26; Ulrich Tröhler and Volker Zimmermann, '250 Jahre Medizin an der Georgia Augusta', in Hans-Günther Schlotter, *Die Geschichte der Verfassung und der Fachbereiche der Georg-August-Universität zu Göttingen* (Göttingen 1994), 66–85: 74ff.

[34] Gruber 1955 (note 26), 25.

[35] Pütter 1765 (note 20), I: 235ff.

[36] Albrecht Haller, *De Methodico Studio Botanices Absque Praeceptore* (Gottingae 1736).

medicine within only 8 days."[37] The plants in this garden were specifically arranged as a form of horticultural architecture, as Pütter describes, in order to make groups for the special interests of physicians. Some years later, all plants were bedded out in single lines, and the paths between them were broadened for easy access by students and scholars.[38] Obviously, aesthetic aspects were suspended in order to satisfy the needs of teaching by visual instruction and learning by inspection. These needs were met by a small forest [Wäldchen] in the modern English style of horticulture near the garden.[39]

Furthermore, an agricultural garden was laid out near the first observatory in 1768. Johann Beckmann (1739–1811), professor of cameralistics, grew all types of agricultural plants there and also experimented on them. He offered a weekly lecture in order to demonstrate plants and give practical instructions for engrafting and other botanical practices. For these demonstrative purposes he collected agricultural machines, tools and ploughs as well as forest plants and seeds from trees. He also visited manufactories, mines, glass factories, and other industrial facilities with his students.[40] He contributed much to the founding of the later sciences of forestry, agriculture and technology, which were all taught empirically. Thirty years later, the agricultural garden was not large, comparatively, but it contained almost every type of agricultural plant.[41]

Another important room for medical studies was the accouchement clinic [Accouchier-Anstalt] near Kreuz Church that is considered the first in Germany. In 1751, Haller supported Roederer as the director of this new maternity hospital.[42] Roederer supervised physicians and midwives who observed and trained in obstetric practices on live patients. Because women in the eighteenth century usually gave birth at home, it was difficult to recruit pregnant women as teaching objects. Hence, unmarried women from the lower classes were offered free treatment if they delivered their children in the hospital and endured the curious views, touches, and forceps used by trainees.[43] Even though the first

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37 Pütter 1765 (note 20), I: 236 (translated by G.B.).
38 Pütter 1788 (note 20), II: 251.
39 Ibid.
40 Götz von Selle, *Die Georg-August-Universität zu Göttingen 1737–1937* (Göttingen 1937), 149.
41 Boockmann 2006 (note 25), 27.
42 Von Selle 1937 (note 40), 72.
43 Jürgen Schlumbohm, ' "Die Schwangeren sind der Lehranstalt halber da". Das Entbindungshospital der Universität Göttingen 1751 bis ca. 1830', in Jürgen Schlumbohm and

Fig. 2. Accouchement clinic in Göttingen (1791): "Interior of the accouchement clinic" / "View from the main floor in the accouchement clinic" / "The accouchement clinic"; copperplate engravings by Chr. A. Besemann, Niedersächsische Staats- und Universitätsbibliothek Göttingen.

trials with clinical accouchements were no less complicated and dangerous than domestic ones, this model proved to be such a success that the old building with two rooms became too small. Thus, the second accouchement clinic was built for this empirical-experimental way of teaching and practical training in 1791. Obviously, the function of this larger and more splendid building was not only to meet the medical requirements of obstetrics. Lichtenberg called it an "accouchment palace" [Akkouchier-Palast].[44] Aside from the functions of teaching and learning this "new, very good-looking" hospital[45] served another purpose: This building, like many other buildings constructed for experimentation, represented the rise of experimental sciences. In fact the architecture, with a magnificent lobby dominated by curved stairs, was not useful for medical purposes at all.[46] Like a temple for "humanity and charity" with a splendid entrance, it could have inspired confidence in the patients. It was conducive to affording comfort for patients but also to commanding the admiration of visitors. Even without any special collection and having been constructed only for experimental medical studies, the clinic gained the status of an attraction. Thus Goethe, for instance, visited it during his sightseeing-tour of Göttingen in 1801.[47] It expressed the ambitions of practical demonstration of medicine as part of the university that devoted itself to the new experimental sciences.

The second observatory, finished in 1816, succeeded the first, which had become "dark, clammy, and muffled".[48] Moreover, the baroque tower observatory was now considered insufficient compared to modern buildings such as the observatory on top of the Seeberg hill near Gotha. Astronomers now preferred buildings outside the town because of the cumulative city lightning that interfered with observations by night. In Göttingen, they found a place near Geismar town gate. The observatory instruments could be set up with low vibration close to the ground in this one-storied building. The middle wing, oriented to the south, was the

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Claudia Wiesemann (eds.), *Die Entstehung der Geburtsklinik in Deutschland 1751–1850: Göttingen, Kassel, Braunschweig* (Göttingen 2004), 31–62: 38ff.

[44] Georg Christoph Lichtenberg, *Schriften und Briefe*, ed. by Wolfgang Promies (München 1968–1972), 4 vols., IV: 664.

[45] Boockmann 2006 (note 25), 25f.

[46] Only ventilation that could have prevented infections can be seen as one advantage resulting from its height, cf. Schlumbohm 2004 (note 43), 34. But its representative and ornate design was not related to any reason concerned with health.

[47] Johann Wolfgang von Goethe, *Werke. Weimarer Ausgabe* (reprint, München 1919), 80/III.3: 20.

[48] Boockmann 2006 (note 25), 27.

Fig. 3. Observatory in Göttingen (1816). Engraving, property of Klaus Beuermann.

workplace, while the eastern and western wings provided living places primarily for the observers. Its neo-classical front and the rotunda in the lobby next to the two spacious halls for the meridian circles signified the importance of astronomy. Not least of all, Carl Friedrich Gauß, who lived and worked there until his death in 1855, contributed to the progress of this science.[49] The high hemispheric cupola for observation became a landmark of the empirical-experimental sciences. Such exteriors represent both the social ambitions of experimenters and the epistemic ambitions of their experiments.

The interior surrounding the experimental desk was adapted to the needs of the experimenter and his audience. Step by step, the technical, instrumental, and architectural conditions were optimized, for example room sizes, laboratory equipment, number and design of laboratories and desk space, lighting facilities, means of transport, and the distances

[49] Hartmut Grosser and Hans-Heinrich Voigt, 'Die Universitäts-Sternwarte', in Dietrich Hoffmann and Kathrin Maack-Rheinländer (eds.), *"Ganz für das Studium angelegt". Die Museen, Sammlungen und Gärten der Universität Göttingen* (Göttingen 2001), 188–193: 190f.

between rooms with different functions.[50] Finally, work environment, tools, and experimental activities were adapted to each other. The architecture of the laboratories and lecture halls corresponded with the theatricality of scientific performance.[51]

Instruments, apparatuses, and the architecture of labs, lecture and study rooms were not only operational; they also replaced experimentation in some way, because the experiment itself is just a fugitive event. All technical equipment represented an experimental process, even if the experiment was not ongoing. In this context, the interior and exterior of experimentations are the signs of experiments. They are the residual of the experimental process that is almost always absent. Like a theatre stage, instruments and rooms are framed for experimental actions and formed by experimental performances, and refer to experiments that were done there and that can be repeated there. Buildings, interiors, and instruments represent the dispositif of experiment. Consequently, objects and space provide a constant, visible manifestation of experiments. This modeling corresponds to the growing importance of experiments in academic teaching on the one hand and in learning experimental practices on the other hand.

Experimental Practices in Academic Performance and Training

Even though Hollmann, Segner, and Kästner experimented in their lectures on physics and chemistry, such performances became the main part of the lectures in experimental physics given by Johann Christian Polycarp Erxleben (1744–1777) and especially by Lichtenberg.[52] Lichtenberg conducted more than 600 experiments per semester, as his student Gamauf related, or even more than 800 experiments.[53] Another student

[50] In addition, Kohlrausch demanded electricity, central heating, ventilation, and an iron-free building for Würzburg's institute of experimental physics in the late nineteenth century, cf. Friedrich Kohlrausch, 'Promemoria zum Neubau eines physikalischen Instituts an der kgl. Universität Würzburg (1875)', in Friedrich Kohlrausch, *Gesammelte Abhandlungen*, ed. by Wilhelm Hallwachs et al. (Leipzig 1910), vol. 1, 1009–1019: 1015–1019.

[51] Auditoriology currently demands the same conditions and technical facilities for experimentation tables in lecture halls as for laboratories, cf. Aschoff 1971 (note 23), 247. Thus the experimentation desk became a standardized stage for both teaching and research.

[52] Friedrich Hund, *Die Geschichte der Göttinger Physik* (Göttingen 1987), 26.

[53] Gottlieb Gamauf, *Erinnerungen aus Lichtenbergs Vorlesungen*, ed. by Albert Krayer (Göttingen 2008), 18; letter from Lichtenberg to J.A. Schernhagen, 31 March 1783, see Georg

wrote about Lichtenberg's teaching: "Usually they say that they do not listen to a reading about physics but they attend a lecture with experiments. In this sense, he has not listeners but rather spectators."[54] So Lichtenberg modeled himself on his ideal of experimental physics in a way that "we accept nothing by experience that we did not prove by visual inspection."[55] Lichtenberg taught experimental physics for 23 years. He became so famous for experimentations that he had more than 100 people in the audience every semester. But in contrast to the chemical experimenter Gmelin for whom a laboratory was built, the professor of physics did not get his own institute due to the lower reputation of this discipline after the first advent of the new experimental sciences. For teaching purposes, Lichtenberg rented a hall in the house of the publisher Dieterich, where he lived. Because of the rising number of students who wanted to attend his lectures, he moved to a larger lecture hall above Dieterich's living room around 1784. But there was not enough room for his equipment. Hence, his instruments had to be carried downstairs from another room every time when they were needed in the lectures.[56] Contemporary descriptions of his second lecture hall make clear that Lichtenberg tried to arrange it considering the needs of experimenters as well as of observers. The long side of this room was the place for the experimentation table. On the narrow side that adjoined his own living room, there stood an elevated lectern for the professor. He adjusted the seating banks in the manner of an amphitheater [amphitheatralisch].[57] But the room was level with the ground; this is why not every seat provided the best view of the experimentation table. Lichtenberg handed out receipts with seat numbers for those who paid for the course. The ticket determined the quality of one's view.[58]

Although experiments took the centre stage, Lichtenberg's lectures did not turn out to be solely physical theatre shows but theoretically informative experimental performances. He experimented in order to demonstrate

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Christoph Lichtenberg, *Briefwechsel*, ed. by Ulrich Joost (München 1985), 5 vols., II: 582. The figure of 800 might have referred to Lichtenberg's experiment repertoire.

[54] For this quotation from Wilhelm Friedrich August Mackensen around 1788/89, see Ulrich Joost, 'Einleitung', in Gamauf 2008 (note 53), VII–XL: LIX (translated by G.B.).

[55] Georg Christoph Lichtenberg, *Vorlesungen zur Naturlehre. Notizen und Materialien zur Experimentalphysik*, ed. by Akademie der Wissenschaften zu Göttingen (Göttingen 2007), 3 vols., I: 29 (translated by G.B.).

[56] Joost 2008 (note 54), XXVI.

[57] Gamauf 2008 (note 53), 10.

[58] Joost 2008 (note 54), XXVI.

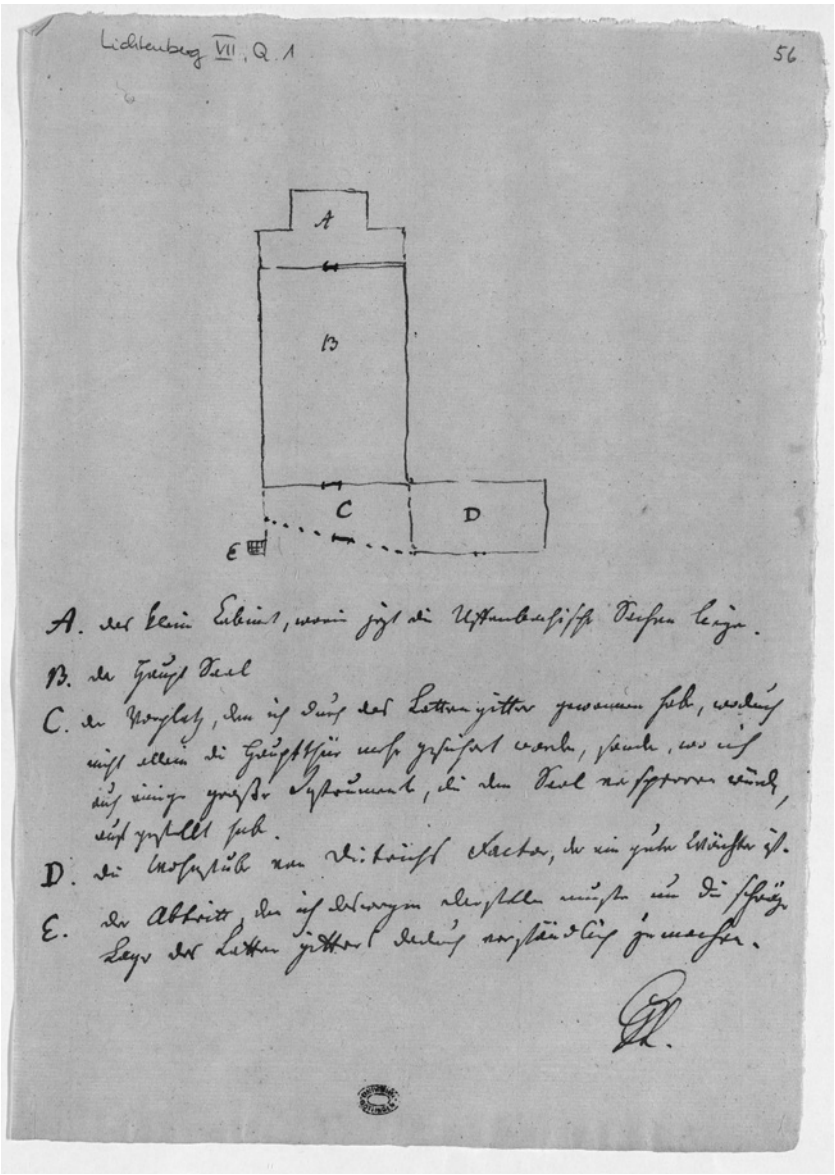

Fig. 4. Layout plan of Lichtenberg's physics cabinet in the Büttner house in Göttingen, Niedersächsische Staats- und Universitätsbibliothek Göttingen.

physical theorems. For practical purposes, he presented the latest and best instruments, their improvements, and their flaws. Furthermore, he explained in detail how to use them, how much they cost, where to buy them, and how they could be copied. However, the experiment is primarily demonstrated; its explanation and the theorem were imparted afterwards. The experiment as well as the technical devices, their experimental function, and instructions for how to use them became the main subject. Thus, the rise of the experiment created a focus on experimental practices and technical devices. In Göttingen, Lichtenberg started extra shows of physical apparatuses as Kästner did for astronomical instruments. Aside from performing experiments and explaining instruments during the lecture hours, presentations of apparatuses alone were offered regularly, for instance by Lichtenberg's assistants Klindworth and Seyde on Saturday or on Sunday.

Although Lichtenberg sold his apparatus to the University of Göttingen in 1789 and earned a life annuity for it, he was allowed to continue using it in his residence during his life-time. Among other instruments, his four electrostatic generators, electrophori, air pump, and an apparatus for demonstrating centrifugal force were the core of the University's later collection of physical instruments.[59] After Lichtenberg's death, his successor Johann Tobias Mayer moved the apparatus to the university museum. Instead of being preserved, it was still used for demonstrations there, since it was put into a neighboring chamber of the lecture hall.[60] Even Lichtenberg's audience of instrument presentations was usually restricted to those who had paid for his private lectures. Pütter points out that students as well as non-academics might now view it there. Pütter relates that Apel, the University's mechanic who was one of the guards of the physical cabinet and assisted with the physics lectures, welcomed "also strangers who want to see the apparatus".[61] Sightseeing of places (as we saw in the example of the accouchement clinic) and of apparatuses as well (e.g. the observatory) was seminal for the establishment of the experimental method. Those who did not join the academic community had an opportunity to become a part of the experimenting society by attending guided tours and hands-on observations. These presentations

[59] Hund 1987 (note 52), 29ff.
[60] Pütter 1820 (note 20), III: 488f.
[61] Ibid., III: 493.

for non-academics broke up the exclusivity of academic circles.[62] Besides the individual experimenters' curiosity, some kinds of experiment tourism strengthened the spread of experimentation inside as well as outside academic structures.

As for practices, Haller and Lichtenberg experimented consistently: Haller intensified his specialized research by performing experiments, Lichtenberg extensified his experimentation in almost all fields of natural philosophy for research as well as for teaching purposes. Both effected the implementation of the experimental method and of experimental practices into research, lectures, apparatuses collections, and the architecture of the university. Their efforts seem to be summed up in Wilhelm Weber's work for the University of Göttingen as a place of studies and training in experimental physics. When Weber (1804–1891) came to Göttingen, the "physical cabinet" moved, because it had been stored in a room so small that one could conduct neither research nor demonstration experiments therein. The new room was heated and met the requirements for training in experimental practices. The establishment of a physical cabinet and physical training in Göttingen is closely associated with Weber's research success.[63] His pupil Friedrich Kohlrausch strengthened practical education and gave guidelines for physical procedures that are still standards today.[64]

By contrast with Lichtenberg's well-documented experimentation spectacle, we do not know much about the first attempt to teach experimental chemistry. Johann Christoph Cron announced a Collegium Chymicum theoreticum experimentalem, in which he promised to give a demonstration and hands-on seminar,[65] and a Collegium metallurgicum practicum,

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[62] In contrast to the experimental movement of the nineteenth century, however, such shows were still offered exclusively to people with a certain social status and not to a general public.

[63] Hund 1987 (note 52), 38.

[64] Friedrich Kohlrausch, *Leitfaden der praktischen Physik zunächst für das physikalische Prakticum in Göttingen* (Leipzig 1870). The 24th edition of this book was published in 1996.

[65] "A [lecture] on theoretical and experimental chemistry following the method of the most famous chemists, especially Stahl and Boerhaave. He [i.e. Cron] promises to collect their experiments and to communicate them most clearly so that curious gentlemen can not only observe the most important chemcial operations from all three parts of nature but can also practice hands-on experiments if they want to." [Ein [Collegium] Chymicum Theoretico-Experimentale, nach der Methode derer berühmtesten Chymicorum, sonderlich Stahlii und Boerhavii derer . . . experimenta er zu sammeln, und . . . aufs deutlichste zu communiciren, verspricht, also dass die Herren Curiosi . . . nicht allein die vornehmsten Operationes chymicas aus allen 3 Natur-Reichen sehen, sondern auch, wenn es beliebig ist,

in which he wanted to demonstrate how to amalgamate, to found, to separate, and to analyze different sorts of minerals, in 1735. To be sure, Segner began to teach chemistry and to demonstrate chemical operations in 1748. Brendel and Vogel also held such lectures, perhaps in the pharmacy or in their private labs.[66] Paul Gottlieb Werlhof (1699–1767) had already asked for a chemical laboratory to be incorporated in the department of medicine, which he wanted to be well equipped with instruments and a heating place, even before the university was founded.[67] But Münchhausen satisfied the chemists with only the university pharmacy, not with a lab of their own. Only in 1783 did the chemist Gmelin got a public chemical laboratory in order to train students and do research on metallurgy to improve the mining industries of the Harz Mountains. Gmelin gave a wide range of courses on pharmaceutics, mineralogy, and technical analysis, which he complemented with experimental lectures on chemistry, especially on technical chemistry applied for arts and crafts.[68] Friedrich Stromeyer (1776–1835), Gmelin's successor, inaugurated practical training for students in 1806 for the first time at a German university.[69] Making a habit of experimental practices became an essential part of modern education for students in chemistry and other experimental sciences. The main protagonist of a systematic study program in chemistry, including experimental training, was Justus von Liebig, who promoted courses of this sort at the University of Gießen beginning in the 1820s.

Other experimental disciplines besides anatomy, physics, and chemistry were taught at the University of Göttingen in the eighteenth century. Due to his school of veterinary medicine [Vieh-Arzneischule], Erxleben was the first German academic veterinarian.[70] The university management did not initially regard veterinary practice as an academic discipline, but admitted that it was useful especially for horsemanship, horse and cattle breeding, and agriculture. It considered supporting Erxleben's plan financially, allowing him to found a practical training centre of veterinary

selbst Hand ans Werck legen können …]. Günther Beer, 'Die Anfänge der Chemie an der Universität Göttingen', *Museumsbrief der Göttinger Chemie* 26 (2007), 2–17: 4f.

66 Oskar Glemser, 'Die Entwicklung der Chemie in Göttingen seit Gründung der Universität 1734', in Schlotter 1994 (note 33), 173–184: 173.

67 'Paul Gottlieb von Werlhofs erfordertes Gutachten wegen einer medicinischen Facultät 1733', in Rössler 1987 (note 10), 298–304: 300.

68 Glemser 1994 (note 66), 174.

69 In order to train pharmacists, chemists, and other practitioners, some courses were available only outside of the universities, for example those offered by Johann Bartholomäus Trommsdorff (1770–1837) in Erfurt since 1795.

70 Gruber 1955 (note 26), 33.

medicine in 1770. Due to his premature death, the academic development of this discipline came to a standstill until Friedrich Karl Lappe (1787–1854) continued it after fifty years. Although Lappe as director of the veterinary institute had to fight to be respected by his colleagues,[71] the administrators' change of mind shows the power of the experimental method: Experimental practices and techniques had gained a higher status in the academic hierarchy. They were able to institutionalize new subjects and disciplines as well as disciplinary operations by means of training.

The Establishment of the Dispositif of Experiment

Experimentations were supposed to be presented and represented by showing instruments, demonstrating and teaching experimental practices, and creating an experimental environment. Although fugitive experimental events could not be presented constantly, their dynamics could be adapted by repeating them (ideally non-stop), or reflected in architectural and technical experimental structures representing them. It is not by chance that Haller, who paved the way for the new experimental method, called for adequate buildings for the experimental sciences and also demanded that experiments be repeated, even though for a different explicit reason. From Haller's point of view, the experimenter should not trust a singular experience: "There is no experiment or operation that is to be done only once; and truth can never be recognized other than by the invariable success of repeated experiences."[72] British empiricism also claimed the replication of experiments in physics, but Haller was one of the earliest scientists in the German-speaking countries to insist that research experiments not only in physics but in biology and other disciplines as well should be done more than once. For him it was inevitable to replicate research experiments in order to demonstrate exactly the same results and to discuss differing hypotheses.[73] Before experimental setups, devices, and practices were standardized, any experiment conducted combined research and teaching activities by hazarding the theoretical

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[71] Johannes Tütken, *Privatdozenten im Schatten der Georgia Augusta* (Göttingen 2005), 2 vols., II: 779–781 and 788–812.

[72] Albrecht von Haller, 'Vorrede des Verfassers', in id., *Anfangsgründe der Phisiologie des menschlichen Körpers* [Elementa physiologiae corporis humani], transl. by Johann Samuel Haller (Berlin and Leipzig 1759–1776), 8 vols., I: unpaginated.

[73] Steinke 2005 (note 14), 150. Concerning the controversy between Haller and Coschwitz, cf. Rainer Godel in this volume.

assumptions. This is why his research procedures and results are distinguished from contemporaries' works in anatomy, physiology, embryology, and botany by complex and comparative observations as well as exact and repeated experimentation.[74] Haller regularized experimental setups by giving detailed descriptions and prescriptions of his experiments. By this means, he encouraged the standardization of instruments and their use, e.g. experimental maneuvers by hand. His efforts thus served the research as well as the teaching purposes of experimentation.

As this look at epistemic change has shown, experimentation is about capturing a fugitive natural event that is observable or that is provoked by technical devices. Presentation and representation of the fugitive experimental activity may work by conducting and re-conducting experimental events. Instruments, experimentation desks, and buildings closely related to and associated with the experimental performances are evocative of the experimental event even after it is conducted. They must assure the replicability of experiments at any time. In this sense, rooms are a kind of memorial to experimental events. Moreover, they demonstrate the all-time potential of their repetition in future by providing the technical conditions for performance. Technical and architectural structures for experimental requirements are no less social than epistemic representations of experiments. The campus buildings and laboratories that were erected for the new experimental sciences, scattered through the town of Göttingen, are analogous to the dispositif of experiment that shaped the infrastructure of minds and collectives.

As we have seen, the experimental method infiltrated scientific disciplines such as medicine, anatomy, physics, botany, and astronomy and helped establish new disciplines such as veterinary medicine and technology. This illustrates the establishment of the dispositif of experiment. Undoubtedly, individual efforts and expenses were involved in shaping an academic structure according to experimental requirements. For example, Haller and Lichtenberg enforced the growth of the experimental method during the first decades of the University of Göttingen. Overall, Georgia Augusta was a driving force in promoting experimentation in the sciences due to its programmatic progress, local concentration and dynamic force, financial investments, interdisciplinary dissemination, and European-wide

[74] Otto Sonntag and Hubert Steinke, 'Der Forscher und Gelehrte', in Steinke, Boschung, Proß 2008 (note 10), 317–346: 326–328.

impact.[75] Nevertheless, the continuance of the experimental "movement" until today cannot be totally explained by certain celebrities who are virtually forgotten in our day, or the spirit of an age [Zeitgeist], but by the overwhelming effort of the dispositif of experiment that became manifest in discourses, architectures, apparatuses, and practices since the epistemic revolution of the early Enlightenment.

[75] Kamp 1985 (note 12), 17f. and 21.

OBSERVATION AND ENLIGHTENMENT

Lorraine Daston

Introduction: The Age of Observation

On 22 July 1757 the Genevan naturalist Charles Bonnet wrote to his Bernese colleague Albrecht von Haller:

> I have often revolved in my mind the plan of a work which I would have entitled *Essay on the Art of Observing*. I would have collected as in a tableau the most beautiful discoveries that had been made since the birth of philosophy. I would have shown the routes by which the great masters of the art had reached the sanctuary of Nature. I would have indicated the obstacles they had to overcome; the means they used; the different views offered to their minds [and] the use to which they put these. I would have demonstrated that the spirit of observation is the universal spirit of the arts and sciences. But, Monsieur, for a work like that I would have to have had your head. If your occupations ever allowed you to undertake [such a work], what an excellent logic it would furnish us with![1]

Neither Bonnet nor Haller ever managed to write such a work on the art of observation,[2] but Bonnet's claim that "the spirit of observation is the universal spirit of the arts and sciences" and that scientific observation was a new and powerful kind of logic would have been loudly echoed by many

[1] "J'ai souvent eu dans l'esprit le plan d'un Ouvrage que j'aurois intitulé *Essai sur l'Art d'Observer*. J'y aurois rassemblé comme dans un Tableau les plus belles Découvertes qui ont été faites depuis la naissance de la Phylosophie. J'aurois montré les routes par lesquelles les Grands Maîtres de l'Art sont parvenus dans le Sanctuaire de la Nature. J'aurois indiqué les obstacles qu'ils ont eu à prendre; les moyens qu'ils ont eu à employer; les différentes vuës qui se sont offertes à leur esprit; l'emploi qu'ils ont sçu en faire. J'aurois fait voir que l'esprit d'Observation est l'esprit universel des Sciences et des Arts. Mais, Monsieur, pour un Ouvrage comme celui là il me faudroit votre Téte. Ha! Si vos occupations vous permettoient jamais de l'entreprendre, quelle excellente Logique ne nous vaudroit-il pas!" Charles Bonnet to Albrecht von Haller, Geneva, 22 July 1757, in Otto Sonntag (ed.), *The Correspondence between Albrecht von Haller and Charles Bonnet* (Bern 1983), 107 (translation by L.D.).

[2] At Bonnet's urging, the Genevan pastor and naturalist Jean Senebier ended up writing the treatise: Jean Senebier, *L'Art d'observer* (Genève 1775), 2 vols. On the background, see Hans Poser, 'Die Kunst der Beobachtung: Zur Preisfrage der Holländischen Akademie von 1768', in id. (ed.), *Erfahrung und Beobachtung: Erkenntnistheoretische Untersuchungen zur Erkenntnisbegründung* (Berlin 1992), 99–119.

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Enlightenment savants, whether anatomists or astronomers, botanists or chemists, physicians or physicists. By the mid-eighteenth century, observation was practiced, theorized, and celebrated in almost all sciences. "Never has so much been observed, as in our century."[3] The Enlightenment has been called the Age of Reason, but from the standpoint of the natural and human sciences, it would be still more accurate to call it the Age of Observation.

During the Enlightenment, the prestige of scientific observation reached its zenith—as an art, a logic, a way of life. Never before or since has observation figured so prominently among cultivated scientific practices. Throughout the Latin Middle Ages, *observatio* was associated with shepherds, sailors, farmers, and other outdoor workers who practiced what Cicero had called "natural divination": waiting and watching for correlations between the stars, the weather, fat and lean harvests, the migration of birds, and other natural phenomena. Observation on this model was slow, cumulative, and anonymous, handed down orally from generation to generation in the form of proverbs like "Red in the morning, sailors take warning". Only astronomical observations counted as part of the learned tradition and even these were made rarely; until well into the sixteenth century, European astronomers and astrologers relied largely on ancient observations. For medieval natural philosophers, observation was useful but not scientific: at best, it was a tool of the conjectural sciences like medicine and alchemy, condemned to deal with individual particulars rather than universal causes.[4] Observation, since Antiquity linked with divination, was triply at the mercy of chance: the chance concatenation of causes, the chance opportunity of being at the right place at the right time, and the chance accumulation and transmission of past wisdom. For Aristotelian natural philosophers, chance was most unpromising material for genuine science.

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[3] Benjamin-Samuel-Georges Carrard, *Essai qui a remporté le prix de la Société Hollandoise des Sciences de Haarlem en 1770, sur cette question, qu'est-ce qui est requis dans l'art d'observer* (Amsterdam 1777), 1. Carrard won the Haarlem Academy of Science's prize for the best work on observation: Poser 1992 (note 2), 99–119; Jan Gerrit Bruijn, *Inventaris van de Prijsvragen uitgeschreven door de Hollandsche Maatschappij der Wettenschappen 1753–1917* (Haarlem 1977). Senebier's entry was awarded the Academy's approbation and was probably more widely read (and translated) than Carrard.

[4] See Katharine Park, 'Observation in the Margins, 500–1500', in Lorraine Daston and Elizabeth Lunbeck (eds.), *Histories of Scientific Observation* (Chicago 2011), 15–44.

For very different reasons, scientists since the mid-nineteenth century have also taken a jaundiced view of observation. Unlike their medieval predecessors, nineteenth-century men of science considered observation to be essential to science. But they distinguished observation sharply from experiment, describing the one as passive and requiring minimal skill and the other as active and demanding the utmost ingenuity. The French physiologist Claude Bernard emphasized that "the mind of the experimenter must be active, that is to say he must interrogate nature and pose questions in every sense, following the various hypotheses that suggest themselves to him", whereas the observer embodied "the passive senses that obeyed the intellect in order to realize an experiment designed with a preconceived idea in view."[5] The British astronomer John Herschel demoted observation to an amateur activity, to be discharged by an army of volunteers who would diligently "observe regularly and methodically some particular class of facts" and fill out standardized forms consisting of "distinct and pertinent questions, admitting of short and definite answers".[6] Twentieth-century philosophers of science took the devaluation of observation in science a step further by positing a "neutral observation language" that barely differed from mere looking—a form of empiricism too rudimentary to be suspected of being "theory-laden".[7]

Such condescension would have greatly surprised Bonnet, for whom observation was the highest, not the lowest form of scientific inquiry. For Enlightenment savants, observation was an elite learned activity, too lofty for unlettered sailors or shepherds and too demanding for amateur foot soldiers. Observation was decidedly active, fully engaging the senses and the intellect; observation and experiment were intertwined, not opposed. True observers were born, not made: "Depending on the kind of observations in question, it is necessary that he [the observer] have clear-sighted eyes, very sensitive touch, a good nose, a delicate palate, and keen hearing.

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[5] Claude Bernard, *Introduction à l'étude de la médecine expérimentale* [1865], ed. by François Dagognet (Paris 1866), 52–54 and 71.

[6] John F.W. Herschel, *A Preliminary Discourse on the Study of Natural Philosophy* (reprint of 1830 edn., Chicago 1987), 131–134. Herschel's vision of centralized networks of standardized volunteer observers was to some extent realized in nineteenth-century meteorology: Fabien Locher, *Le Nombre et le temps. La météorologie en France (1830–1880)*, dissertation, Ecole des Hautes Etudes en Sciences Sociales, 2004; Katharine Anderson, *Predicting the Weather: Victorians and the Science of Meteorology* (Chicago 2005).

[7] For a brisk, perspicuous account of the philosophical positions in the mid-twentieth-century anglophone discussion of scientific observation, see Ian Hacking, *Representing and Intervening: Introductory Topics in the Philosophy of Natural Science* (Cambridge 1983), 167–185.

He also needs dexterity, sagacity, and intellectual penetration, which are gifts of nature that can be more or less developed but not acquired by art."[8] Throughout the long eighteenth century, observation featured prominently in the titles of learned books and articles; its prestige surpassed that of both experiment and deduction; it was the yardstick by which savants took each other's measure; it was even possible to become a "genius of observation".

My aim in this paper is to reconstruct what scientific observation meant in precept and practice for Enlightenment savants like Bonnet, von Haller, and a host of other citizens of the eighteenth-century Republic of Letters. Between circa 1660 and 1830 observation reigned supreme in the natural and human sciences: cultivated as a practice, analyzed as a logic, embraced as a vocation. How did observation rise to such heights after centuries of learned neglect? How were perception, attention, judgment, and memory schooled to craft an observation? Who was the observer and what demands were made on a life dedicated to observation, which notoriously disrupted diurnal rhythms, constrained socializing, and endangered health? Above all, what kind of knowledge did observation promise; in other words, how could observation serve, in Bonnet's phrase, as an "excellent logic".

Observation Comes of Age

By the turn of the seventeenth century, observation as both word and practice was taking root in the activities of the learned as well in the routines and proverbs of farmers, sailors, and shepherds. The Holy See and the Spanish Council of the Indies issued voluminous questionnaires to solicit the observations of missionaries and colonial administrators in foreign lands; northern European humanists wrote treatises with detailed advice on what to observe while travelling for young men bound for Paris or Padua; physicians compiled and published "observations" of rare and

[8] "Selon ce qu'exige le genre d'observations dont il s'occupe, il faut qu'il [l'observateur] ait des yeux clairvoyans, le tact très-sensible, l'odorat bon, le gout délicat, & l'ouie fine. Il a aussi besoin d'une dextérité, d'une sagacité, & d'une penetration d'esprit, qui sont un present de la Nature, & dont le germe ne peut s'acquérir par l'art, mais seulement se developper par ce moyen, plus ou moins complètement." Benjamin Carrard, *Essai qui a remporté le prix de la Société Hollandaise des Sciences de Haarlem en 1770. Sur cette question. Qu'est-ce qui est requis dans l'Art d'Observer; & jusques-où cet Art contribue-t-il à perfectionner l'Entendement?* (Amsterdam 1777), 5.

striking cases; naturalists exchanged specimens, descriptions, and images in correspondence and in print; astronomers self-consciously improved upon older observations and enlarged the store of new ones. As an English guide for educated travellers composed around 1600 and probably edited by Francis Bacon declared, book learning and firsthand observation now marched hand-in-hand: "The best scholler is fittest for a Traveller, as being able to make the most useful observation: Experience added to learning, makes a perfect man."[9] As a form of learned experience, *observatio* took its place among a throng of other early modern innovations, including *historia, factum, casus*, and *experimentum*.[10]

A rough census of title of books published in Latin, English, French, Italian, and German between 1600–1800 containing the word "observation(s)" in the title shows a steadily rising tendency.[11] Perhaps as a concomitant to that trend, the subject matter is highly diverse. However, some thematic clusters do emerge, here listed in rough chronological order: astronomical/astrological and meteorological observations; philological observations

[9] Robert, Earl of Essex, Sir Philip Sidney and Secretary Davison, *Profitable Instructions; Describing What Speciall Observations Are to Be Taken by Travellers in All Nations, States, and Countries; Pleasant and Profitable* (London 1633), sig. A_3v. On the book's date of composition and connection with Bacon, see Joan-Pau Rubiés, 'Instructions for Travellers: Teaching the Eye to See', *History and Anthropology* 9 (1996), 139–190: 187 (note 72).

[10] There now exists a substantial literature on the history of early modern scientific experience. Book-length studies include: Arno Seifert, *Cognitio historica. Die Geschichte als Namengeberin der frühneuzeitlichen Empirie* (Berlin 1976); Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton 1985); Giuseppe Olmi, *L'inventario del mondo. Catalogazione della natura e longhi del sapere nella prima età moderna* (Bologna 1992); Paula Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Berkeley 1994); Peter Dear, *Discipline and Experience: The Mathematical Way in the Scientific Revolution* (Chicago 1995); Christian Licoppe, *La Formation de la pratique scientifique: le discours de l'expérience en France et en Angleterre* (1630–1820) (Paris 1996); Mary Poovey, *A History of the Modern Fact: Problems of Knowledge in the Sciences of Wealth and Society* (Chicago 1998); Lorraine Daston and Katharine Park, *Wonders and the Order of Nature, 1150–1750* (New York 1998); Barbara J. Shapiro, *A Culture of Fact: England, 1550–1720* (Ithaca 2000); Simona Cerutti and Gianna Pomata (eds.), *Fatti: storie dell'evidenza empirica*, a special issue of *Quaderni storici* 108 (2001); Gianna Pomata and Nancy G. Siraisi (eds.), *Historia: Empiricism and Erudition in Early Modern Europe* (Cambridge 2005); Jean-Claude Passeron and Jacques Revel (eds.), *Penser par cas* (Paris 2005); Johannes Süßmann, Susanne Scholz and Gisela Engel (eds.), *Fallstudien: Theorie—Geschichte—Methode* (Berlin 2007).

[11] Based on a preliminary bibliography prepared by Sebastian Gottschalk, using the online catalogues of World Cat, the British Library, the Library of Congress, and the Herzog-August-Bibliothek Wolfenbüttel, and counting titles in Latin, French, Italian, German, and English, circa 82 titles were published 1550–1599, 98 from 1600–1649, 246 from 1650–1699, 681 from 1700–1750, and 1988 from 1751–1800. These figures of course give only a rough indication, but the relative increases are probably reliable.

on classical texts (a humanist publishing enterprise in full swing by the mid-sixteenth century); travel reports by the mid-sixteenth century and instructions to travellers as to what to observe by the early seventeenth century; medical observations based on individual cases by the late sixteenth century; ditto for the *observationes forenses* concerning judicial procedures; and, by the mid-seventeenth century, observations on a wide range of natural philosophical and natural historical topics.

Although all the book titles describing their contents as "observations" seem to recur to the sense of that word as a "remark" or "comment upon", by the late seventeenth century, self-avowed scientific observations clearly meant something more specific by the term. Special procedures, carried out by specially qualified people, under special circumstances distinguish the scientific observation from the all-purpose remark. At very least, these observers were expected to exercise unusual care: in his preface to the third year of the *Philosophical Transactions*, Secretary to the Royal Society Henry Oldenburg expressed the hope that "our Ingenious Correspondents have examin'd all circumstances of their communicated Relations, with all the care and diligence necessary to be used in such Collections . . ."[12] These sentiments were echoed in the *Histoire naturelle des animaux*, published by the Paris Académie royale des sciences, which purportedly contained "no facts that have not been verified by the whole Company, composed of people who have eyes for seeing these sorts of things, in contrast to the majority of the rest of the world . . ."[13] The Paris Académie also occasionally noted the special qualifications of a correspondent to make exact observations.[14] This was especially the case when the phenomenon in question was extraordinary, likely to pander to the "love of the marvelous" or to excite fear in unqualified observers: a French astronomer observing a spectacular aurora borealis in 1726 remarked smugly that although everyone had seen the celestial lights, there was "nonetheless this difference,

[12] [Henry Oldenburg], 'A Preface to the Third Year of these Tracts', *Philosophical Transactions of the Royal Society of London* 2 (1667), 409–415: 410.

[13] *Mémoires de mathématique et de physique. Année MDCXCII. Tirez des registres de l'Académie Royale des Sciences*, Amsterdam 1723, 'Avertissement', call number 2r. Readers were assured that "petites pièces" published in the journal were just anticipations of and distractions from "des longs Ouvrages à quoi ils [the academicians] sont assidûment appliquez."

[14] See for example 'Observations physiques', *Histoire de l'Académie Royale des Sciences 1666–1699*, vol. 1, 177, apropos of Richer's observations of the pendulum and refraction of solar light in Cayenne.

that the philosophers had observed it with a tranquil eye, and the people were always carried away by fear".[15]

Although "experiments" differed from "observations" in involving "trials", which manipulated nature to bring about an effect, the boundary between the two genres remained fluid throughout the eighteenth century. From the 1670s onward, "observations and experiments" were coupled in the fashion of "love and marriage" or "horse and carriage". Experiments were often mingled with observations, as when Parisian anatomists tried to inflate the lungs of a strangled corpse they were dissecting,[16] and observations were always part of experiments. The boundary between observation and experiment could be quite fluid: when for example Haller described his investigations of the embryological development of chicks in his letters to Bonnet, he used the words *observation* and *expérience* almost interchangeably.[17] Nonetheless, there were at least two crucial differences: first, experiments tested conjectures already formulated while observations served as a source of new conjectures (a point to which I shall return in the conclusion); and second, while experiments were usually about particulars, an account of an event localized in time and space,[18] even if their conclusions were generalized to the universe at large, observations could be general as well as particular.

Some observations, especially of singular events, were as particularized as experiments, but many were about a category—bees, pineapples, saltpetre, comets—in general. Sometimes generalization took the form of "reflections" appended to descriptions of particulars, but sometimes it was built into the very diction of the observation: "There are four principal parts of the oyster",[19] "The branches [of the American cedar] are furry

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[15] "cette différence néantmoins que les Philosophes l'ont observée d'un oeil tranquille, & que le Peuple [étaient] toûjours porté à craindre…" [Louis] Godin, 'Sur le météore qui a paru le 19 octobre de cette Année', *Mémoires de l'Académie Royale des Sciences. Année 1726* (Paris 1728), 287–302: 287.

[16] 'Observations anatomiques', Archives de l'Académie des Sciences, Paris. MS. Procès-Verbaux, 22 décembre 1666–avril 1668, 52–57: 53.

[17] Haller to Bonnet, 14 October 1754; Haller to Bonnet, 26 November 1754; Haller to Bonnet, 9 October 1755, Haller to Bonnet, 7 December 1756, in Sonntag 1983 (note 1), 107.

[18] On the late seventeenth-century experimental report as a historical narration of particular, localized events, as opposed to an assertion of what happens always or most of the time, see Dear 1995 (note 10), 210–232; Licoppe 1996 (note 10), 53–87.

[19] "On decouvre quatre principales parties dans les huîtres écaillées." Joseph Pitton de Tournefort, *Observations sur les huîtres*, Bibliothèque du Muséum National d'Histoire Naturelle, Paris. MS. 254, fol. 1r.

or covered with a white membrane."[20] What in these textual examples is accomplished by the use of the singular definite article and the eternal present tense was accomplished perceptually and intellectually by remarkable feats of seeing, noting, selecting, and synthesizing. These were the *practices* of observation, the subject of the next section.

Making Observations

Bacon, the first philosopher of observation, anticipated that most scholars would find the actual making of observations an intensely unpleasant business: laborious, tedious, bewildering, demeaning, even disgusting.[21] It would be both exasperating and expensive—and perhaps hazardous to one's health to boot. If the division of labor in the House of Salomon described in *The New Atlantis* (1627) is anything to go by, Bacon did not intend to do the grunt work himself; small armies of underlings (starting with the "Merchants of Light") would labor to fill the warehouses of natural history with data that the Interpreters of Nature could then thresh and grind into a new and better natural philosophy.[22] The surviving manuscript notes for Bacon's own unfinished natural history, the *Sylva sylvarum*, are dotted with commissions like "To send to Meverell" or "To send to a Diall-Maker";[23] of some thousand entries, only twenty-six seem to be based on Bacon's own observations.[24] Much of Book I of the *Novum organum* can be read as a pep talk to reluctant naturalists, coaxing and cajoling them on the necessity of making observations: how were bookish

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[20] "Ses branchages [du cypre de l'Amérique] sont velus ou couverts d'un poil blanc." *Observations sur quelques Plantes de l'Amerique avec les Descriptions et quelques figures envoyées a Messieurs Fagon premier Medecin de Louis XIV Roy de France et Raudot. Par le R. Pere Le Breton, Missionnaire Apostolique de La Compagnie de Jesus. du Cap François de Saint Dominique. Le 27 Juillet 1715* du Muséum National d'Histoire Naturelle, Paris. MS. 668, 91.

[21] See, for example, Bacon, *Novum organum* [1620], Bk. I, Aphorisms LXXXIII, CXX, in Basil Montagu (ed.), *Lord Bacon's Works* (London 1825–1834), 17 vols., IX: 242–244 and 270–271.

[22] Francis Bacon, *The New Atlantis* [1627], in Francis Bacon, *The Great Instauration and the New Atlantis*, ed. by Jerry Weinberger (Arlington Heights 1980), 79–80.

[23] British Library, Additional MSS. 38, 693. Graham Rees identifies the hand as that of Bacon's amanuensis William Rawley and suggests that Meverell might have been an alchemist: Graham Rees, 'An Unpublished Manuscript by Francis Bacon: Sylva sylvarum Drafts and Other Working Notes', *Annals of Science* 38 (1981), 377–412.

[24] Ibid., 385–390.

scholars trained to handle, appraise, and coin words to learn to manipulate, assay, and order things?

Some solutions to this dilemma were reminiscent of the "great number of servants and attendants" to be employed in Solomon's House.[25] Professional gardeners were engaged to cultivate the physic gardens of Pisa and Leiden; assistants performed experiments in the laboratories of Robert Boyle and Christiaan Huygens; curators arranged and dusted the specimens in many a *Wunderkammer*. Yet recourse to hired help to deal with the recalcitrant and laborious world of things had its limits, and these were not only budgetary. Even among Bacon's contemporaries, firsthand observation of naturalia was coming to be seen in terms of both duty and delight. The Zurich humanist and naturalist Conrad Gessner wrote feelingly of the pleasures of botanizing excursions into the surrounding countryside;[26] English natural philosopher Robert Hooke promised new recruits to the pursuit of natural knowledge not only "high *rapture* and *delight* of the mind" but also "*material* and *sensible Pleasure*."[27] Even having a paid staff at one's beck and call did not preclude conducting one's own observations. Boyle took a luminous diamond to bed with him, "holding it a good while upon a warm part of my naked body", to see if it would thereby shine more brightly;[28] the imperial botanist Charles l'Ecluse (also known as Carolus Clusius) collected his own plant specimens in the Austrian Alps, rain or shine.[29]

Moreover, the elaborate methods that Bacon had recommended for the sifting and correlating of observations—the compilation of Tables of Essence and Presence, the Presentation of Instances, the Exclusion of Natures, and the successive Vintages—all of these baroque how-to instructions were internalized and integrated by subsequent generations of naturalists. Eighteenth-century treatises on the art of observation taught by example and precept rather than by laborious method. Whereas Bacon had called for mechanical aids that would level the differences between

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[25] Bacon 1980 (note 22), 80.

[26] Brian Ogilvie, *The Science of Describing* (Chicago 2006), 70.

[27] Robert Hooke, *Micrographia: Or Some Physiological Descriptions of Minute Bodies Made by Magnifying Glasses* (London 1665), unpaginated preface.

[28] Robert Boyle, 'A Short Account of Some Observations Made by Mr. Boyle, about a Diamond, that Shines in the Dark', in *The Works of the Honourable Robert Boyle*, ed. by Thomas Birch (reprint of 1772 edn., Hildesheim 1965), vol. 1, 789–799: 797.

[29] Brian Ogilvie, *The Science of Describing* (Chicago 2006), chapter 5.

intellects,[30] later theorists of observation invoked "genius".[31] Observation had become a matter of pleasure rather than discipline, virtuosity rather than plodding method, implicit practices rather than explicit techniques. For these reasons, it is necessary to have recourse to manuscript jottings as well as published presentations and manuals in order to reconstruct these practices.

Such a reconstruction could easily furnish material for a fat book, especially if it included the use of instruments and the making of images, from rough sketch to engraved plate. Here I can consider only two such practices: channelling attention and synthesizing multiple impressions. Both of these practices had a cognitive as well as a material dimension: the habits of framing experience in excerpts, of mentally analyzing objects into component parts, and of selectively remarking and remembering the essential rather than the accidental, the characteristic rather than the anomalous, the type rather than the deviation. Cognitive practices are by their nature more difficult to excavate; yet they are integral to any understanding what is epistemic about an epistemic category like observation or experiment. It would be a mistake to dismiss them as merely psychological and therefore not of epistemological import. They certainly *were* psychological, but they also crystallized objects of inquiry, dictated how they could be rendered intelligible, and, above all, bridged the particular and the universal and connected past, present, and future.

Paying Attention

For Enlightenment naturalists, observing was first and foremost an exercise of attention. As Bonnet's protegé, the Genevan pastor and naturalist Jean Senebier wrote in his influential 1775 treatise *L'Art d'observer*: "... attention alone renders the observer master of the subjects he studies, in uniting all the forces of his soul, in making him carefully discard all that could distract him, and in regarding the object as the only one that exists for it [i.e. attention] at that moment ..."[32] Attention is by definition exclusive, the faculty of creating foreground and background, focus and fringes. But economies of attention differ not only in their preferred objects, but also in their specific practices.

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[30] Bacon, *Novum organum* [1620], Bk. I, Aphorism CXXII., in Montagu 1825–1834 (note 21), IX: 273–275.

[31] Senebier 1775 (note 2), I: 15–16.

[32] Ibid., 144.

We still lack anything like a full-dress history of attention,[33] but some sense of the diversity of practices can be gleaned from the rich literature on the history of spiritual exercises in ancient philosophy and religious meditation. There is for example the question of the favoured physical posture: certain ancient schools of philosophy recommended that discussions between masters and pupils be conducted while walking to stimulate attention (hence the term "peripatetic" to designate the tradition stemming from Aristotle's Lyceum); others, like the Stoics, commanded disciples to lie down in order to let the events of the day pass before mind's eye in review[34]—a posture also adopted in Christian meditation and visionary trance, as in the case of Boethius.[35] Then there is the matter of the object of attention: Allegorical ornaments? The stations of the cross? A drunken man? The smooth beads of the rosary fingered one by one?[36] In the long history of Christian meditation, there were multiple points of departure for the deepening and brightening of attention, each appealing to a different sense and bodily habitus. A broader survey of other meditative traditions would no doubt expand still further the repertoire of possible postures, objects, and disciplines. Hence merely to gesture towards the central role of attention in Enlightenment observation

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[33] Studies of various special topics in the history of attention include: for general bibliography, see Lemon L. Uhl, *Attention. A Historical Summary of the Discussions concerning the Subject* (Baltimore 1890); on the place of absorption in eighteenth-century French art criticism, see Michael Fried, *Absorption and Theatricality: Painting and Beholder in the Age of Diderot* (Berkeley, Los Angeles and London 1980) and on links between forms of attention and modernism in art, Jonathan Crary, *Suspensions of Perception: Attention, Spectacle, and Modern Culture* (Cambridge and London 1999); in literature, Roger Chartier, 'Richardson, Diderot et la lectrice impatiente', *Modern Language Notes* 114 (1999), 647–666, and Adela Pinch, *Strange Fits of Passion: Epistemologies of Emotion, Hume to Austen* (Stanford 1996), especially 152–163; in pedagogy, Christa Kerstig, *Die Genese der Pädagogik im 18. Jahrhundert. Campes "Allgemeine Revision" im Kontext der neuzeitlichen Wissenschaft*, dissertation, Freie Universität Berlin, 1992; in medicine, Michael Hagner, 'Psychophysiologie und Selbsterfahrung: Metamorphosen des Schwindels und der Aufmerksamkeit im 19.Jahrhundert', in Aleida Assmann and Jan Assmann (eds.), *Aufmerksamkeiten* (München 2001), 241–264; in early modern science, Lorraine Daston, *Eine kurze Geschichte der wissenschaftlichen Aufmerksamkeit* (München 2001).

[34] Michel Foucault, *Histoire de la sexualité*, vol. III: *Le Souci de soi* (Paris 1984), 84–87; Pierre Hadot, *Philosophy as a Way of Life*, ed. by Arnold I. Davidson, translated by Michael Chase (Oxford 1995), 81–144.

[35] Mary Carruthers, *The Craft of Thought: Meditation, Rhetoric, and the Making of Images, 400–1200* (Cambridge 1998), 173–179.

[36] Ibid., 167–169; Frank Livingstone Huntley, *Bishop Hall and Protestant Meditation in Seventeenth-Century England: A Study with Texts of the Art of Divine Meditation (1606) and Occasional Meditations (1633)* (Binghamton 1981); François Lecercle, 'Image et médiation: Sur quelques recueils de méditation illustrés de la fin du XVI^{e} siècle', in Cahiers V.L. Saunier, *La Méditation en prose à la Renaissance* (Paris 1990), 44–57.

tells us too little; we must examine the particular practices of attention with the naturalists' own magnifying glass.

Although many Enlightenment naturalists made observations in the field—André Deluc scaling the Alps, Joseph Banks sailing the southern seas with Captain Cook, Charles Marie La Condamine measuring the meridian and botanizing in Peru—the pose associated with the actual making of an observation was frozen immobility, whether seated or standing. The French naturalist René Antoine Ferchault de Réaumur related how during a leisurely promenade along the Loire he had stood stock-still to watch red ants copulate;[37] his Genevan disciple Bonnet spent hours mesmerized by a caterpillar spinning its cocoon.[38]

If the characteristic posture of the attentive Enlightenment naturalist was motionless, hunched, and peering, it was in part because the characteristic objects of attention were often small, and made smaller still by the naturalist. In 1760 the Dutch jurist and naturalist Pierre Lyonet published his magnum opus, a massive anatomical treatise devoted entirely to one species of wood-gnawing caterpillar. Lyonet's original ambition had been to treat many insects, but he had found that the comprehensive description he aimed for could hardly be achieved for even a single species, despite over a decade spent dissecting and drawing every nerve, every muscle, every vein of a caterpillar half the length of his finger. Unwilling to trust an artist to convey the exactitude of his microscopic observations, Lyonet drew and engraved his plates himself: "there was not even the tiniest globule of fat of which I did not take care to represent the least crease and twist exactly after nature. Only this can give the figures that character of merit, that sharpness, that precision, which I hope connoisseurs will recognize in my plates."[39] To see like a naturalist was to analyze, to decompose the small into the minute.

The peculiar economy of attention cultivated by the Enlightenment naturalists was pointillist, magnifying, and therefore deliberately repeti-

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[37] René Antoine Ferchault de Réaumur, *Histoire des fourmis*, introduction de E.L. Bouvier, avec notes de Charles Pérez (Paris 1928), 51–52.

[38] Charles Bonnet, 'Observation XXIII: Particularités sur l'industrie de la grande Chenille *à tubercules* du Poirier', *Traité d'insectologie* [1745] in id., *Oeuvres d'histoire naturelle et de philosophie* (Neuchâtel 1779), vol. 1, 230–237.

[39] "... il n'y a pas jusqu'au plus petit lobe de graisse, dont je n'aye eu soin de représenter exactement d'après nature les moindres plis & replis. C'est ce qui eut seul donner, à des Figures, ce caractère de vérité, cette netteté, cette precision, que j'espère que les Connoisseurs reconnoîtront dans mes Planches." Pierre Lyonet, *Traité anatomique de la chenille, qui ronge le bois de saule* (The Hague 1760), xi.

tive. Visually and intellectually, the observer pulverized the object into a mosaic of details, focusing first on one, then another. Even if observers worked without a lens or microscope, they imitated with the naked eye the circumscribed, pinpoint field of vision imposed by such optical instruments. Senebier directed the fledgling observer to compensate for the "feebleness of his soul and senses in fragmenting [morcelant] the subject of his observations and in studying each of its parts separately."[40] Only the narrowness of focus could sufficiently concentrate attention to the level of intensity required for exact observations, as a parabolic mirror might fortify the intensity of a reflected light beam at the focal point. The metaphor of the burning glass is used advisedly: the exercise of attention was supposed to burn [ébranle] even the most trivial details into the observer's senses and memory.[41] The engravings that illustrated the works of the naturalists carry the traces of these practices of attention. Details were excised and magnified; a swarm of letters and numbers dissected the depicted object into its component parts. So pencil-thin and intense was the beam of attention that it could hardly be sustained over long periods. Hence the observer must return over and over again to the same object, picking out different details, different aspects each time and multiply confirming what had already been observed.[42] Haller wrote to Bonnet that the true secret of the art of observation was to "verify an infinite number of times all that I believed I had seen that was remarkable."[43] Still better was the repetition of observations by several observers, not because the veracity of the initial observations was in doubt, but rather to widen the panorama of different perspectives on the same object[44]—a kind of institutionalization of the blind-men-and-the-elephant procedure, in which one reports on the tail, another on the tusks, still another on the ears. Bonnet urged Italian naturalist Lazzaro Spallanzani to repeat the

[40] "…[attention] seule le [l'observateur] rendra maître des sujets qu'il étudie, en réunissant sur chacun toutes les forces de son ame, en lui faisant écarter soigneusement tout ce qui pourroit la distraire, & regarder l'objet qui l'occupe comme s'il étoit le seul qui exista dans ce moment pour elle…" Senebier 1775 (note 2), I: 144.

[41] "…la faiblesse de son ame & de ses sens, en morcelant le sujet de ses observations, & et en étudiant séparement chacune de ses parties." Ibid., 165.

[42] Ibid., 188.

[43] "…pour moi, mon unique remede contre l'erreur été de verifier une infinité de fois tout ce que j'ai cru voir de remarquable." Haller to Bonnet, 1 September 1757, in Sonntag 1983 (note 1), 109.

[44] Carrard 1777 (note 3), 207.

observations of others, including his own: "Nature is so varied that we can hardly vary our attempts too much."[45]

The result of these practices was an avalanche of descriptive detail, both visual and, especially, verbal. At first naturalists felt obliged to apologize for the tedious length of their descriptions, so ill-suited for polite audiences;[46] later, they apologized for the brevity of their descriptions, at least to other naturalists, for detail had become the proud badge of initiates.[47] Their most ingenious efforts were directed towards the discernment of the most fleeting details, the finest nuances. Yet even the most zealous devotés of detail sometimes felt engulfed and overwhelmed. Lyonet, the demon of detail, quailed before the prospect of naming every organelle of caterpillar anatomy: "Ten thousand names would not have sufficed; a Dictionary would have been needed to find them; . . ." He pardoned the reader who skipped the chapter (seventy-four pages long) on caterpillar bronchia, the number of which by his estimate exceeded the sum total of all other anatomical parts put together.[48] The effect of such painstaking attention was dizzying, even disorienting. The miniscule object of observation—the horns of an aphid, the proboscis of a bee—swelled to fill the entire visual field, only to disintegrate into still more minute minutiae, until the observer lost sight of the object altogether.

Synthesis

No study of natural particulars could afford to become permanently mired in particulars. Bacon had feared naturalists might drown in the "perpetual waves" of experience;[49] Enlightenment observers gladly wallowed in them—but no one deemed them an end in themselves. The practices of taking notes and paying attention as they were cultivated during the mid and late eighteenth century tended to fragment the object of inquiry: numbered, dated notebook entries chopped up time into slices; narrowly

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[45] "La Nature est si variée que nous ne saurions trop varier nos essais." Bonnet to Spallanzani, 27 December 1765, in Charles Bonnet, *Oeuvres d'histoire naturelle* (Neuchâtel 1781), vol. 5, 10.

[46] See for example Denis Dodart, 'Mémoires pour servir à l'Histoire des Plantes', in *Mémoires de l'Académie Royale des Sciences. Depuis 1666 jusqu'a 1699* (Paris 1731), vol. 4, 121–242: 130.

[47] See for example Bonnet to Réaumur, 27 July 1739, Dossier Charles Bonnet, Archives de l'Académie des Sciences, Paris.

[48] "Dix mille Noms n'y auroient pas suffi; il eut fallu un Dictionnaire pour les trouver; . . ." Lyonet 1760 (note 39), vii and x.

[49] Francis Bacon, 'Distributio operis', in Montagu 1825–1834 (note 21), IX: 175.

focused attention dissolved wholes into tiny parts. The challenge to what I will call the practices of synthesis was to glue all these fragments back together again into a coherent mosaic—but not thereby to reconstitute the actual object of observation. Instead, the result of the synthesis was a general object—variously described as an archetype, an ideal, an average, or a pure phenomenon—that was more regular, more stable, more universal, more *real* than any actually existing object. Enlightenment astronomers, anatomists, and naturalists all theorized the general object;[50] here I shall restrict myself to some of the practices they used to synthesize it out of a welter of particular observations.

Although observers were sometimes struck by singular phenomena, such as an aurora borealis or a monstrous birth, by the mid-eighteenth century they attempted whenever possible to situate individual objects and events in a series. This practice had its antecedents in the longstanding astronomical practice, common since the late sixteenth century, of creating long baselines of multiple observations of the same star or planet. In other sciences of the eye, observers repeated observations of the same or similar objects in order to establish a series. Goethe, reflecting in 1798 on his researches in morphology and optics, described the quest for the "pure phenomenon", which can be discerned only in a sequence of observations, never in an isolated instance. "To depict it, the human mind must fix the empirically variable, exclude the accidental, eliminate the impure, unravel the tangled, discover the unknown."[51] If such a sequence was not readily available to direct observation because of the rarity of the phenomenon, it was compiled from past records: the French astronomer Louis Godin began his report to the Académie Royale des Sciences on the October 1726 aurora with a compilation of all previous such sightings, starting with Flavius Josephus and concluding with a summary of the features common to all such cases.[52] Ideally, not only the naturalists but also their artists were supposed to be familiar with a broad range of exemplars,

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[50] See Lorraine Daston and Peter Galison, *Objectivity* (New York 2007), chapter 2, also Patrick Singy, 'Huber's Eyes: The Art of Scientific Observation before the Emergence of Positivism', *Representations* 95 (2006), 54–75.

[51] "Um es darzustellen bestimmt der menschliche Geist das empirisch Wankende, schließt das Zufällige aus, sondert das Unreine, entwickelt das Verworrene, ja entdeckt das Unbekannte." Johann Wolfgang Goethe, 'Erfahrung und Wissenschaft', in Dorothea Kuhn and Rike Wankmüller (eds.), *Goethes Werke* (seventh edn., München 1975), 14 vols., XIII: 25; translated (slightly modified) by Douglas Miller (ed.), *Goethe: Scientific Studies* (New York 1988), 25.

[52] Godin 1728 (note 15), 297–298.

so that images as well as descriptions would be the distillation of not one but many individuals carefully observed. The ways in which naturalists and artists achieved such distillations were conceived along similar lines, and in both cases touted as a title to genius, a faculty of synthetic perception that elevated the master above the mere amateur or artisan.[53]

Copious descriptions in manuscript observation notebooks were also regularly and sometimes radically pruned for publication. Once observers became familiar enough with the phenomenon in question to distinguish the typical from the idiosyncratic, they omitted all but the most salient and essential details.[54] In his published journal of aurora borealis sightings, the French natural philosopher Jean Jacques d'Ortous de Mairan informed readers that he had made exhaustive notes of a 1733 aurora but that it would be "useless to report them in detail here."[55]

The process of how particulars were forged into generalities is most graphically displayed in the observation notebooks. Under the rubrics of "Reflections" or "Results" or "Remarks" were recorded the digestion of first impressions into second (and sometimes third) impressions. Genevan naturalist Horace-Bénédict de Saussure, in his journal labelled *Voyage autour du Mont Blanc en 1774*, jotted down in pencil whatever caught his eye along the way: a ruined château, the strata of slate rock that struck him as displaced from their original position, the nickname of his local guide, barometer and thermometer readings. The timed entries and the execrable handwriting suggest that the entries were made in real-time, bouncing along on a bumpy mountain road. But some entries are exceptionally in ink and in a far more legible hand: these dated entries are digests, redactions, reflections, and queries of the preceding real-time entries.[56]

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[53] Daston and Galison 2007 (note 50), 79–82.

[54] Lorraine Daston, 'Description by Omission: Nature Enlightened and Obscured', in John Bender and Michael Marrinan (eds.), *Regimes of Description: In the Archive of the Eighteenth Century* (Stanford 2005), 11–24.

[55] Jean Jacques d'Ortous de Mairan, 'Journal d'observations des aurores boréales, qui ont été vuës à Paris, ou aux environs, dans le cours des années 1732 & 1733. Avec plusieurs observations de la lumière zodiacale, dans les mêmes années', *Mémoires de l'Académie Royale des Sciences. Année 1733* (Paris 1735), 477–499: 497.

[56] Horace-Bénédict de Saussure, 'Voyage autour du Mont Blanc en 1774, 10e. Juil.', Bibliothèque publique et universitaire de Genève, MS Saussure 14/1. For a detailed analysis of a comparable scientific notebook, see Marie-Noëlle Bourguet, 'La fabrique du savoir. Essais sur les carnets de voyage d'Alexandre von Humboldt', in *Festschrift für Margo Falk, Humboldt im Netz* 13 (2006), 17–33.

These were observations upon observations, the refinement and distillation of raw materials into what Bacon had called "vintages". Here the older Renaissance practices of Humanist note-taking were preserved in spirit if not in substance: what sixteenth-century scholars had done for the writings of Cicero and Livy, eighteenth-century naturalists did for oysters and aphids.[57] A first round of observations selected the noteworthy; a second round winnowed these further by comparisons and cross-correlations, seeking patterns and regularities; a third synthesized the features now understood to be the most significant or essential into the general observation. Whatever the metaphysics of individual naturalists might have been, there was nothing Platonic about this process. It required long and deep immersion in natural particulars, the exercise of sustained and analytical attention, and multiple stages of sieving, sifting, and synthesizing. The general object could no more be extracted from a Platonic ideal than 24-karat gold could be refined out of the idea of gold.

The Life of the Observer

The tension between the obligations of daily life and the demands of a regimen of observation are a recurring motif in the correspondence of Enlightenment observers. Haller complained to the Lausanne physician Auguste-Samuel Tissot about time-consuming professional duties that robbed him of time to observe: "I would rather blind myself with a microscope in glaring sunshine [looking at] the eye of a fish. At least I am at home and free."[58] Réaumur moved out of central Paris so as to have more room for his beehives and fewer visitors.[59] For the dedicated observer, normal social life became all but impossible. In his *Traité de météorologie* (1774), the Oratorian and corresponding member of the Académie Royale des Sciences Louis Cotte admitted that the perfect weather observer would have to "renounce almost all other business and every pleasure. Not only would he have to live for years on end in the same

[57] On early modern scientific reading practices and their relationship to Humanist note-taking, see Ann Blair, 'Scientific Readers: An Early Modernist's Perspective', *Isis* 95 (2004), 420–430, and the bibliography given therein.

[58] "J'aime mieux m'aveugler avec le microscope au fort du soleil sur un oeil du poisson. Du moins suis-je chez moi et libre." Haller to Tissot, 11 January 1762, in Erich Hintzsche (ed.), *Albrecht Hallers Briefe an Auguste Tissot 1754–1777* (Bern 1977), 125.

[59] Réaumur to Jean-François Séguier, 25 April 1743, in Académie des Belles-Lettres, Sciences et Arts de La Rochelle, *Lettres inédites de Réaumur* (La Rochelle 1886), 15.

place; he would have to be home regularly every day for the hours of his observations . . .”[60]

Weather-watching, especially if pursued at fixed times of day, could become a way of life, a regimen that set schedules, shooed guests to the door, and fostered clock-consciousness. Still more extreme were the naturalists who flaunted obligation and convention in order to devote themselves entirely to what Bonnet called the “delights of observation.” At circa 5:00 pm on 20 May 1740, Bonnet took an aphid that had “been born before my eyes”, put it in a glass jar with a few leaves, upended the jar in a flowerpot of soil, and resolved to keep “an exact journal of its [the aphid’s] life.” For twenty-one days he dedicated every waking hour from circa 5:30 am to 11:00 pm to the observation of a single aphid (*mon puceron*, later *ma pucerone* after it bore offspring) in order to determine whether the species could reproduce parthogenetically. “Not only did I observe it every day, from hour to hour, beginning at 4:00 or 5:00 am and continuing until 9:00 or 10:00 pm; but I even observed it several times during the same hour, always with a magnifying glass, in order to render the observation more exact, and to inform myself about the most secret actions of our little solitary.”[61]

Under such circumstances of total absorption, the boundary between observation and life dissolved, as can be detected in the bleed-through between observational notebook and private diary.[62] Still more striking were the ways in which lifelong habits of observing nature blended seamlessly into self-observation, as when Haller reported on his latest illness to Tissot in order to solicit the latter’s medical advice:

> Friday the 28th [of February 1772] I had alternations of good pulse. . . . At five o’clock in the evening the room was a bit too warm, and there being several people there, I felt very ill, with an intermittent pulse after 1–2 or 3 pulsations. I took acid elixir and had the window opened: the air, although very warm, being a siroco, had a surprising effect: the pulse immediately regularized itself. Three times I made the same experiment.[63]

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[60] Louis Cotte, *Traité de météorologie* (Paris 1774), 519.

[61] “Non seulement je l’observai tous les jours d’heure en heure, à commencer ordinairement dès quatre à cinq [?] heures du matin, & ne discontinuant guere vers les neuf à dix heures du soir; mais même je l’observais plusieurs fois dans la même heure, & toujours à la Loupe, pour rendre l’observation plus exacte, & m’instruire des actions les plus secretes de notre petit solitaire.” Charles Bonnet, *Traité d’insectologie* [1745], in id. 1779 (note 38), 20.

[62] On diaries during this period, see Sibylle Schönborn, *Das Buch der Seele. Tagebuchliteratur zwischen Aufklärung und Kunstperiode* (Tübingen 1999).

[63] “Vendredi 28 j’us des alternations de bon pouls. . . . A 5 heures du soir la chambre etant un peu trop chaude, et y ayant plusieurs personnes, je me trouvai trez mal, le pouls

The same ingrained habits of noting date and time, counting and measuring, and, above all, repeating an observation once, twice, three times followed Haller into his final years of illness and decline. Observation in the Enlightenment was not yet a profession, in the sociological sense of being remunerated labor supported by institutionalized training and recognition. But it was already a vocation, a calling that demanded total dedication.

Conclusion: What Kind of Knowledge?

Observation in the Enlightenment was a discipline for mind and senses and even a way of life—but did it really deserve Bonnet's praise as an "excellent logic"? If scientific observation was a premiere form of reason in the Age of Reason, as its practitioners claimed, what kind of reason was it? The question is particularly pointed in light of modern views of observation as barely elevated over perception.

If the process of Enlightenment observation was not necessarily metaphysical, in the Platonic sense of revealing eternal forms or archetypes, it was often ontological. It created, or rather crafted, the objects of inquiry. The final stage of observation, the practice of synthesis, was very rarely intended to preserve a particular event or thing in all its peculiarity. Even observations of individual cases and singular phenomena were embedded in a more general frame of reference: comparisons with similar instances, baselines of previous observations, descriptive terms coined to capture general features. The observation as product was the outcome of multiple processes of selection and synthesis, some explicit but most implicit. Their traces can be more readily discerned in the surviving manuscript notes than in the treatises on how to observe—or rather, in the divergences between successive titrations of observations. In some sciences, the practices of synthesis were eventually formalized into methods, as in the case of the method of least squares in geodesy and astronomy, which replaced earlier techniques of perception, memory, and judgment. But in other cases, such as botany, these psychological faculties, exercised on hundreds if not thousands of individual specimens, endured as essential

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intermittant après 1–2 ou 3 pulsations. Je pris de l'Elixir acide, et je fis ouvrir la fenetre: l'air, quoique trez chaud, etant un siroco, fit un effet surprenant: le pouls se regle sur le champ. Trois fois je fis la meme experience." Haller to Tissot, 1 March 1772, in Hintzsche 1977 (note 58), 344.

tools, as did the field notebook. So far, it has not proved possible to mechanize or even methodize the processes that detect patterns in phenomena or even in data. In this sense, there seems to be something irreducibly psychological about the way in which observation works.

Does this disqualify observation as properly epistemological? There is a long philosophical tradition, most starkly represented by Kant and his followers, that holds psychology and epistemology to be immiscible. The question is whether cognitive practices of the sort that I have described have any import at all for how scientific knowledge is acquired.

I would like to suggest that the distinctive kind of knowledge that Enlightenment observation produced was a fusion of the particular and the universal—and in a unique way. Whereas the induction over cases presupposes that component instances are homogeneous enough to be counted and the case study assumes that a well-chosen individual instance must be heterogeneous enough to be narrated at length, the observation simultaneously strives for homogeneity and heterogeneity. Or rather, it embodies the universal in particulars, but not in individual particulars, as the case does, nor in uniform particulars, as the induction by enumeration does. Its closest literary analogue would be the allegory, in which an abstraction like nature or reason is minutely and lavishly described, right down to emblemata and details of dress, but nonetheless remains an abstraction, not a concrete individual. But unlike the allegory, the observation must begin in the concrete, not in the abstract. The painstaking processes of seeing, heeding, noting, tabulating, correlating, describing, and synthesizing must begin in particulars, as wine begins in grapes—the deeper meaning of Bacon's vintages.

If the epistemic character of observation has remained obscure to philosophers, perhaps it is because the knowledge harvested from observation has less to do with proving than with discovering. Its role is primarily productive rather than evidentiary, a source of new conjectures rather than a test of old. Because epistemology since the seventeenth century has been deeply preoccupied with securing rather than generating knowledge, combating errors rather than creating novelty, it is not surprising that it has disdained observation in favour of experiment, a far more effective way of putting hypotheses to the test. But observation's primary role was traditionally not to test but to generate hypotheses. This was accomplished not through any delphic inspiration but by patient discernment that detected the long periods of astronomical phenomena, unsuspected correlations between weather and the habits of animals, subtle patterns that distinguish genera and species.

The contrast between Enlightenment and modern views of observation is epitomized in that between the alleged function of replicating an observation: for modern philosophers of science, replication serves to reveal error or fraud, but for their Enlightenment predecessors, it was to reveal things not seen before and inspire ideas not thought before. In this sense, Enlightenment observation deserved to be called a logic, a genuine logic of discovery.

EXPERIMENTS, JUDICIAL RHETORIC AND THE *TESTIMONIUM*. PRACTICES OF DEMONSTRATION IN THE HAMBERGER-HALLER CONTROVERSY ON THE RESPIRATION MECHANISM

Simone De Angelis

Introduction

In a recent article Peter Galison listed the technologies of argumentation among problems in the History and Philosophy of Science that still need further research: "When the focus is on scientific practices (rather than discipline-specific scientific results *per se*), what are the concepts, tools, and procedures needed at a given time to construct an acceptable scientific argument?"[1] In fact, the history of the tools of argumentation and demonstration is far from being written, especially if we try to understand their meaning and use in the scientific practices of the early modern period.[2] Moreover, if the type of scientific debate addressed in this article constitutes controversy on a physiological topic, then the argumentation-and-demonstration-problem is linked to that of scientific doubt or uncertain knowledge.[3] However—and this goes along with the focus on scientific practices—it is by analysing the controversy that the link between the two problems can be explained. The discursive phenomenon addressed here shows conformity with the key features of a scientific controversy described by Marcelo Dascal: there are two opponents, a specific problem, an employed language in which they confront their opinions and arguments, expansion of problematic to methodological issues, and questioning of the adversaries' factual, conceptual and methodological assumptions.[4]

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[1] Peter Galison, 'Ten Problems in History and Philosophy of Science', *Isis* 99 (2008), 111–124: 116.

[2] See for a general account R.W. Serjeantson, 'Proof and Persuasion', in Katharine Park and Lorraine Daston (eds.), *The Cambridge History of Science*, vol. 3: *Early Modern Science* (Cambridge 2006), 132–175.

[3] Galison 2008 (note 1), 123f.

[4] Marcelo Dascal, 'The Study of Controversies and the Theory and History of Science', *Science in Context* 11 (1998), 147–154: 149–152; see also id., 'Die Dialektik in der kollektiven Konstruktion wissenschaftlichen Wissens' [2005], in Wolf-Andreas Liebert and Marc-Denis Weitze (eds.), *Wissenskulturen in sprachlicher Interaktion* (Bielefeld 2006), 19–38.

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Thus analysis of controversies also works well for understanding the formulation and use of scientific arguments. However, to link both aspects it is indispensable to challenge a commonly accepted view in the historiography of the disciplines, namely the contrast between logic and rhetoric, as far as the former is seen to be concerned with scientific, i.e. certain or probable demonstration, and the latter with persuasion.[5] This view, however, does not consider all cases in which a) uncertain or probable knowledge as well as so-called "moral certainty" are treated in logic, and b) rhetoric is used to demonstrate something by rational argumentation. The latter is especially the case in judicial rhetoric, as discussed by Aristotle. As James Franklin has pointed out, in the view of the ancients "the theory of probability belonged to rhetoric."[6] According to Franklin this view has some advantages, especially with regard to a large body of data: "all the arguments that are found to be persuasive in practice."[7] This is particularly true of ancient rhetoric, whose purpose "is the construction of persuasive arguments in, especially, courts of law."[8] Thus, the ancient view of rhetoric also offers us a key for understanding the construction of arguments in Albrecht von Haller's published experimental protocols, which will be examined in this article. Hitherto, little has been written about Haller's method of argumentation and demonstration of physiological knowledge. The present article will argue that the published experimental protocols have the function of communicating with the reader, who becomes the judge where controversial issues are concerned. Furthermore, we will see that Haller's argumentation in his experimental protocols follows the method of the ancient and late medieval doctrine of authority and testimony, which will be discussed below.

Opponents, Problems and Judgements

But first, who are the opponents and what is the specific nature of their controversy? Beginning in 1744, Albrecht von Haller (1708–1777), professor of anatomy and botany at the Georgia Augusta in Göttingen, and his rival in Jena, the iatromathematician and professor of medicine, Georg Erhard

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[5] See Serjeantson 2006 (note 2), 135f.

[6] See James Franklin, *The Science of Conjecture. Evidence and Probability before Pascal* (Baltimore and London 2001), 102.

[7] Ibid.

[8] Ibid.

Hamberger (1697–1755), had disputed the mechanics of respiration.[9] Not only did their opinions about the actions of the respiratory muscles differ, they also supported different methods to demonstrate those opinions. Hamberger made use of arguments derived from mechanical laws and constructed hypothetical models that simulate respiration. Haller, on the other hand, developed new forms of experimentation in vivisection with which he contested both of Hamberger's views: 1. that the internal intercostal muscles lowered the chest and thus were responsible for exhalation, whereas the external intercostal muscles raised the chest and were thus responsible for inhalation; 2. that the pleural cavity, i.e. the space between lungs and chest, contained air (fig. 1). Haller's view of problem one, the focus of this article, is opposed to Hamberger's: For him, the internal intercostal muscles raised the chest and were thus responsible for inhalation, whereas the external intercostal muscles lowered the chest and were thus responsible for exhalation.[10] Although the controversy lost its significance after Hamberger's death in 1755 and physiology at Jena was taught according to the writings of Haller by one of his fervid supporters,[11] its meaning can be seen "in the fact that it encouraged Haller to perform many more experiments on other topics, notably on irritability and sensibility".[12] Haller was probably convinced that problems in physiology could be solved by performing a great number of experiments. But the interesting point of this controversy is that from our perspective today, Haller was not correct in his opinion and that Hamberger's view corresponds with "current beliefs" about respiration reported in an important modern anatomy book:

> Taken together, the evidence from these various approaches leads to the following current beliefs about the actions of respiratory muscles in man. Respiration is a highly co-ordinated abdominal and thoracic process in which

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[9] See Alberti de Haller, '*De Respiratione Experimenta Anatomica quibus Aeris inter Pulmonem et Pleuram Absentia Demonstratur et Musculorum Intercostalium Internorum Officio Adseritur* [1746]', in Georg Erhard Hamberger, '*De respirationis mechanismo et usu genuino dissertatio . . .*' (Jena 1749) [recte: 1748], 49–180. The book contains a reprint of Haller's *De Respiratione* 1746 and *De Respiratione* 1747, which are responses to Hamberger's attacks; it also contains different polemic papers by Hamberger as well as Haller's respective reviews in the *Göttingische Gelehrte Anzeigen*. For a list of Haller's works on respiration, see Hubert Steinke and Claudia Profos (eds.), *Bibliographia Halleriana. Verzeichnis der Schriften von und über Albrecht von Haller* (Basel 2004), 118–119.

[10] Hubert Steinke dedicates a few pages to the Haller-Hamberger controversy in his *Irritating Experiments. Haller's Concept and the European Controversy on Irritability and Sensibility, 1750–90* (Amsterdam and New York 2005), 131–132 and 149f.

[11] Ibid., 132.

[12] Ibid.

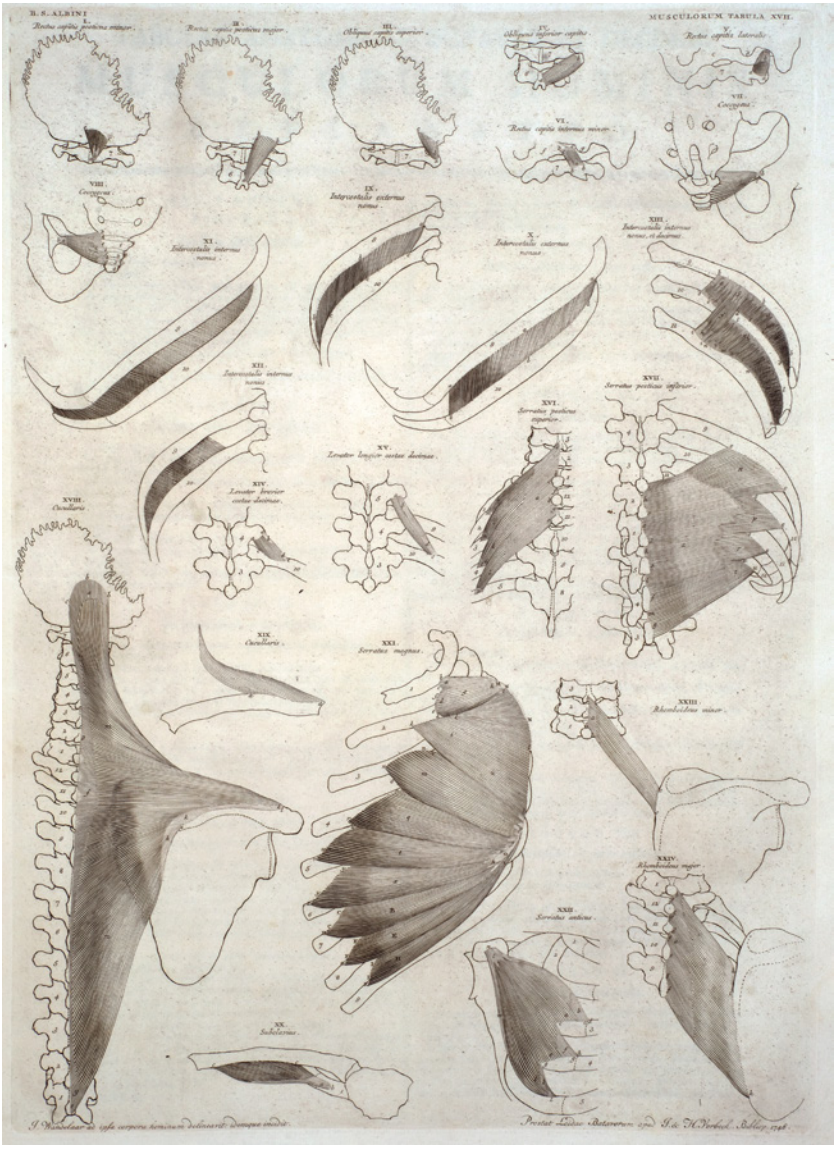

Fig. 1. Bernhard Siegfried Albinus, *Tabulae sceleti et musculorum corporis humani* (Leiden 1747), table 17. Universitätsbibliothek Bern.

> the diaphragm is the major muscle of inspiration, responsible for some two-thirds of the vital capacity. The external intercostal muscles are most active in inspiration and the internal intercostals, which are not as strong, are most active in expiration, but their primary roles are to act together to stiffen the chest wall, preventing paradoxical motion during descent of the diaphragm in inspiration.[13]

However, the present analysis does not so much consider the question of whether Haller's view was right or wrong (from today's point of view) as focus on how Haller argued and defended his opinion and on which technology he used in his argumentation. In an article published in the *Nouvelle Bibliothèque Germanique* in 1748, Haller summarised the state of affairs concerning the controversy and characterised his own and Hamberger's methodological assumptions.

Haller stated that Hamberger did not have occasion to dissect human bodies very frequently and very freely, that he himself could not go into certain details about the structure of the parts and that he thus credited descriptions by various authors, that he applied mechanical laws to these descriptions, and that almost the whole of Hamberger's physiology was founded on the laws of attraction and cohesion.[14] It is important to observe that, according to Haller, Hamberger drew on anatomical descriptions made by other authors, assuming that they were credible and trustworthy. This is a common assumption among early modern scholars and scientists that is based on the "theory of authority", which will be dealt with later.

Haller then stated that his physiology was incompatible with Hamberger's. In his article he referred to himself in the third person singular as "the Goettingen Professor" who drew on anatomy itself; he argues that in his anatomy theatre in Goettingen, founded under his direction, he had been able to create conditions favourable to anatomy in such a way as to verify as many times as necessary all anatomical descriptions needed in physiology.[15] Haller maintained that he neither assumed hypotheses nor

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[13] Peter L. Williams et al. (eds.), *Gray's Anatomy. The Anatomical Basis of Medicine and Surgery* (38th edn., Edinburgh et al. 1995), 818.

[14] [Albrecht von Haller], 'Mémoire sur une Controverse au sujet de la Respiration', *Nouvelle Bibliothèque Germanique* IV/2 (1748), 412–428: 415: "Privé d'ailleurs des occasions de disséquer assez fréquemment & assez librement des corps humains, Mr. Hamberger ne pouvoit pas descendre par lui-même dans un certain détail sur la structure des parties; il posoit en fait les descriptions des Auteurs, & il y apliquoit les loix de la Méchanique."

[15] Ibid., 415f.: "Cette Physiologie ne pouvoit pas se soutenîr en même tems avec celle de Mr. Haller, dont les principes lui étoient entièrement opposés. Le Professeur de Goettingen puisoit ses sentimens dans l'Anatomie même: il avoit sû réunir dans le nouveau Théatre de

intended to invent theories, but that he only verified what was true in theories already transmitted. Haller was convinced that scientific knowledge increased only step by step and that real progress in the sciences takes place only in imperceptible steps through which a new author surpasses his predecessors, nor does he depart from them by means of a jump or a flight.[16] Beyond the metaphorical character of his words, the Göttingen Professor transmitted the message to the reader that he saw himself as a "new author" establishing a new experimental type of physiological research. This self-image also fits with Haller's statement that he forced himself to read everything concerned with physiological matters, to listen to everybody, and to collect useful facts everywhere, putting them in their right place. In this way, he says, he submitted his physiology to the judgement of other people.[17]

We will see that the communicative aspect of his science is very important to Haller in this controversy. It has to be analysed more precisely, together with the argumentative strategies that he adopts to establish himself as a new author on the physiological topic of respiration. Thus what does Haller mean exactly when he says that he submits his physiology to a judgement? Before addressing this question, we shall look at Hamberger's own view of physiology and mechanical demonstration, for which he claims absolute certainty. In the preliminary chapter of the new edition of his dissertation *De Respirationis Mechanismo et Usu Genuino* (1749), Hamberger gives an account of his metaphysical assumptions that reveals much about the reasons for his mathematical approach to physiology. The world for Hamberger seems to be very simple: All objects in it, he says, including the human body and all other physical bodies, were created by a supreme goddess; it is not possible to conceive creation without determination, so that all created bodies are determinated and bring

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Goettingen fondé sous sa Direction, tant de loix favorables à l'Anatomie, qu'il est à même vérifier autant de fois, qu'il est nécessaire toutes les descriptions Anatomiques, dont la Physiologie à besoin." On Haller's experimental practice in his Göttingen laboratory, see Steinke 2005 (note 10), chapter 2.

[16] Haller 1748 (note 14), 416: "Entièrement libre de toute Hypothèse il ne se propose pas d'inventer des Théories, mais uniquement de finir ce qu'il y a de vrai dans celles que nous a données. Il se persuade que les Sciences ne meurissent que peu à peu, & que leur véritable progrés ne se fait que par des pas imperceptibles, dont un nouvel Auteur dévance ses prédecesseurs, & non pas d'un saut ni d'un vol qu'il feroit pour s'en écarter."

[17] Ibid.: "D'ailleurs Mr. Haller s'étoit fait une loi de tout lire, & d'écouter tout le monde, de recueillir partout des faits utiles & de les mettre en oeuvre à leurs place. Il se mettoit par là au fait du pour & du contre sur la Physiologie."

forth their actions because of their determination.[18] Hamberger deems that no one is better able to apply Mathematics—the art of determining the quantitative aspects of the physical world—than physicians and physicists who deal with created objects.[19] He claims that without mathematical tools it is not possible to have an adequate idea of the determined objects (fig. 2).[20]

This is the typical view of an author who follows the metaphysical tradition of Leibniz-Wolffian neoscholastic philosophy which still dominated in German universities in the mid- eighteenth century. In fact, the Hanoverian Göttingen University, founded only in 1737, was an exception. This was not least of all due to the fact that the princedom of Hanover was politically linked through a personal union with the British crown. Thus, Haller must have had above all his rival Hamberger in mind when he criticised the use of mathematical methods in physiology in his preface to volume one of the German translation of Count de Buffon's *Natural History* (1749), written in Göttingen in 1750.[21] However, his critics were also driven by the conviction that it was impossible for fallen humanity to have any absolute knowledge about objects in the created world; with respect to God's knowledge or to that of man's original state described in the Bible, man's knowledge in the postlapsarian state is always second best. In fact, in the preface written on April 1751 to the second edition of his *Primae lineae physiologiae* (1749), Haller clearly distinguished different levels of certainty in his physiology as an empirical science: "As an honest man in the presentation of my physiology I have to indicate which part is

[18] Georg Erhard Hamberger, *Respirationis Mechanismo et Usu Genuino Dissertatio* (Jena 1749), 1f.: "Obiecta igitur Medici atque Physici cum sint opera Summi Numinis, corpus nempe humanum et alia corpora creata, nihil vero sit creatum, quod non esset determinatum, et, ob suam determinationem, non nisi determinatos ederet effectus . . ."

[19] Ibid., 2: ". . . sane nemo melius ipsam artem determinandi quantitatem rerum, Mathesin puto, adplicare, vel usum adplicationis cognoscere, potest, quam Medicus et Physicus, hi enim soli circa tales versantur creaturas, corpora nempe . . . et ex quorum determinatione summa determinandi ars cognosci potest."

[20] Ibid.: ". . . sic contra misera est sors eorum hominum, qui, illotis manibus i.e. absque Mathesi, Summi Numinis considerant opera Mathematica, hi enim de rebus creatis determinatis nunquam adaequatam ideam habere possunt."

[21] See Georges-Louis Le Clerc and Comte de Buffon, *Allgemeine Historie der Natur nach allen ihren besondern Theilen abgehandelt; nebst einer Beschreibung der Naturalienkammer Sr. Majestät des Königes von Frankreich. Mit einer Vorrede Herrn Doctor Albrecht von Haller* (Hamburg and Leipzig 1750), I: I–XVII. For an extended analysis of Haller's preface, see Simone De Angelis, *Von Newton zu Haller. Studien zum Naturbegriff zwischen Empirismus und deduktiver Methode in der Schweizer Frühaufklärung* (Tübingen 2003), 289f.; on Haller's critique of the Leibniz-Wolffian metaphysics, see ibid., 189–206.

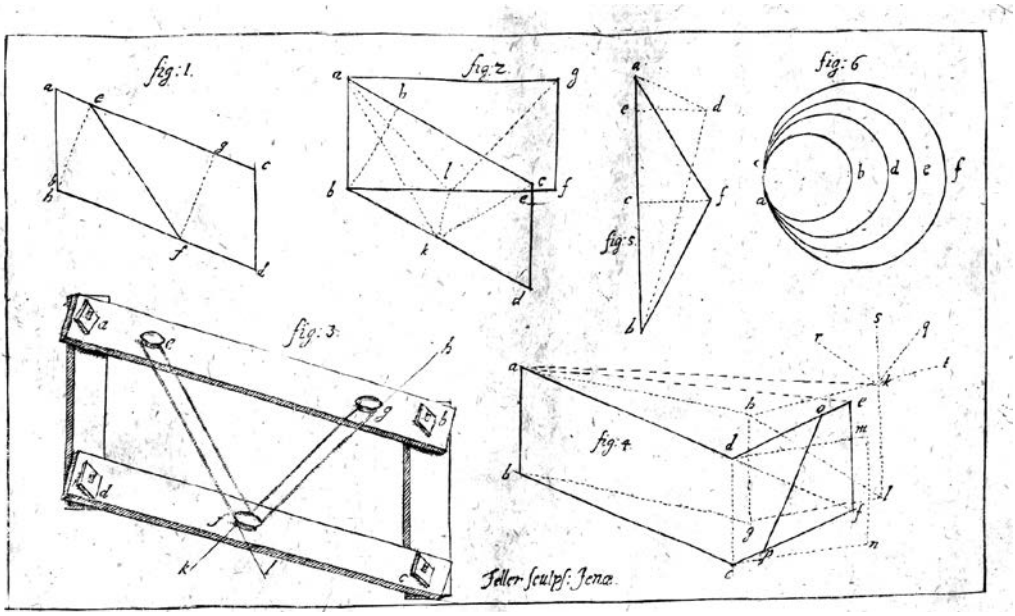

Fig. 2. Hamberger's geometrical models as argumentative tools, from: Georg Erhard Hamberger, *De Respirationis Mechanismo et Usu Genuino Dissertatio* (Jena 1749), a5r. Bern University Library.

true, which is probable, and which is insufficiently ascertained, as far as the weakness of human nature and above all the limits of my reason allow me to do it."[22] *In nuce* Haller reveals a shift to a form of rationality that proceeds without an absolute claim of certainty and that is characteristic of the domain of the empirical sciences since the seventeenth century.[23] We shall return to the form of moral certainty to which Haller alludes in the preface just quoted above.[24]

The aspect of "weaker" knowledge is fundamental to an understanding of Haller's crucial critique aimed at undermining Hamberger's mathematical method of demonstration. It certainly had nourished the controversy from the beginning. For, according to Haller, Hamberger's mechanical

[22] Albrecht von Haller, *Primae lineae physiologiae in usum Praelectionum Academicarum Aucta et Emendata* (Göttingen 1751), preface, 8.

[23] On probabilistic thinking before 1660, see Franklin 2001 (note 6); see also Alistair C. Crombie, *Styles of Scientific Thinking in the European Tradition* (London 1994), 3 vols., II: 1295–1420 ("on intellectual sources of the analysis of probabilities").

[24] On "moral certainty", see Barbara J. Shapiro, *Probability and Certainty in Seventeenth-Century England* (Princeton 1983), 27–37.

demonstrations could not gain the support of the public.[25] The fact that Hamberger reports the statement of his rival in his dissertation of 1749 and above all, his irritated reaction to it, show that Haller indeed had touched a nerve: Hamberger considered Haller's words to be of no account, not because of the latter's lack of mathematical competence, but because he—as a temerarious judge—dared to pass judgement on mathematical papers despite his ignorance.[26] The first point to consider here is again the role of the judge that is attributed to Haller as a reader of and commentator on Hamberger's papers; secondly, the requirement that the reader or judge exhibit a certain competence. Despite the fact that Hamberger considers his rival a non-competent reader of his papers, both disputants conceived natural science in the context of a communicative situation in which natural knowledge, published in textual form, is presented to a public of (competent) readers who may pass judgement on it. This certainly has to do with the fact that in the eighteenth-century controversies and other scientific and cultural debates often took place in a public sphere; societies,[27] periodicals[28] and the network of corresponding scientists and scholars[29] were important platforms for discussing new knowledge. But there is another aspect to consider in the relation between the published text and its reader that has to do with a specific form of rhetoric, namely judicial rhetoric, which requires explanation.

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[25] Hamberger 1749 (note 18), preface, a2r: "Illud quoque contemtum *Hallerus* interpretatur, (p. 131. nota 5.) quod in primo propemptico p. 46. eum inter eos refero, quorum assensum per demonstrationes mechanicas obtinere haud possem . . ."

[26] Ibid., a2v: ". . . sed his verbis Hallerum non contemno, quatenus mathesin non intelligit, sed quatenus, tanquam temerarius iudex, . . . non obstante sua ignorantia, de scriptis mathematicis iudicare audet."

[27] See, for example, Michael Kempe and Thomas Maissen, *Die Collegia der Insulaner, Vertraulichen und Wohlgesinnten in Zürich 1679–1709. Die ersten deutschsprachigen Aufklärungsgesellschaften zwischen Naturwissenschaften, Bibelkritik, Geschichte und Politik* (Zürich 2002).

[28] See, for example, the articles on the Newton debate published in the Genevian *Bibliothèque Italique* in 1730–1732; for a detailed reconstruction, see De Angelis 2003 (note 21), 15–177.

[29] On Haller's network of correspondence, see Hubert Steinke, 'Der Patron im Netz. Die Rolle des Briefwechsels in wissenschaftlichen Kontroversen', in Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005), 441–462.

Experimental Protocols and Judicial Rhetoric

We shall examine this question by starting with two pages of an experimental protocol, written by Haller on an experiment on the mechanism of respiration, which he subsequently published (fig. 3). Those pages are part of a larger collection of protocols that Haller published in the Lausanne edition of his *Opera minora* in 1757 and that he republished in French only one year later under the title: *Mémoire sur plusieurs Phénomènes importants de la Respiration; Fondé sur les Expériences*.[30] As Haller writes, experiment number 30 conducted on 11 December 1752 was devoted to the vivisection of a dog. He opened the dog's chest to examine the functioning of the respiratory muscles: "As far as ribs 10 & 11 are concerned, I saw them rise against the ninth",[31] Haller says. As explained above, for him the intercostal muscles raise the chest and are responsible for inhalation. Yet how does Haller interpret his experimental protocols?

The preface of Haller's *Mémoire* written on 28 December 1757 dedicated to his friend and doctor Christoph Jakob Trew, states: "I renew the public testimony of my sentiments."[32] Thus, Haller announces publicly his esteem for his friend, linking it to his own experimental life. He then designates Trew as an esteemed "enlightened judge" who adds prestige to his work.[33] Thus, Haller sees the publication of his experimental protocols as evidence of what he saw, for example, when opening the dog's chest. The printed protocols are the representation of his witnessing, the written form of his experimental experience. In the preface to the *Opuscula Sua Anatomica De Respiratione*, written in 12 December 1750, Haller comments on and contextualizes the publication of notebooks on vivisection. This earlier collection of experiments on respiration was then published in Göttingen in 1751:

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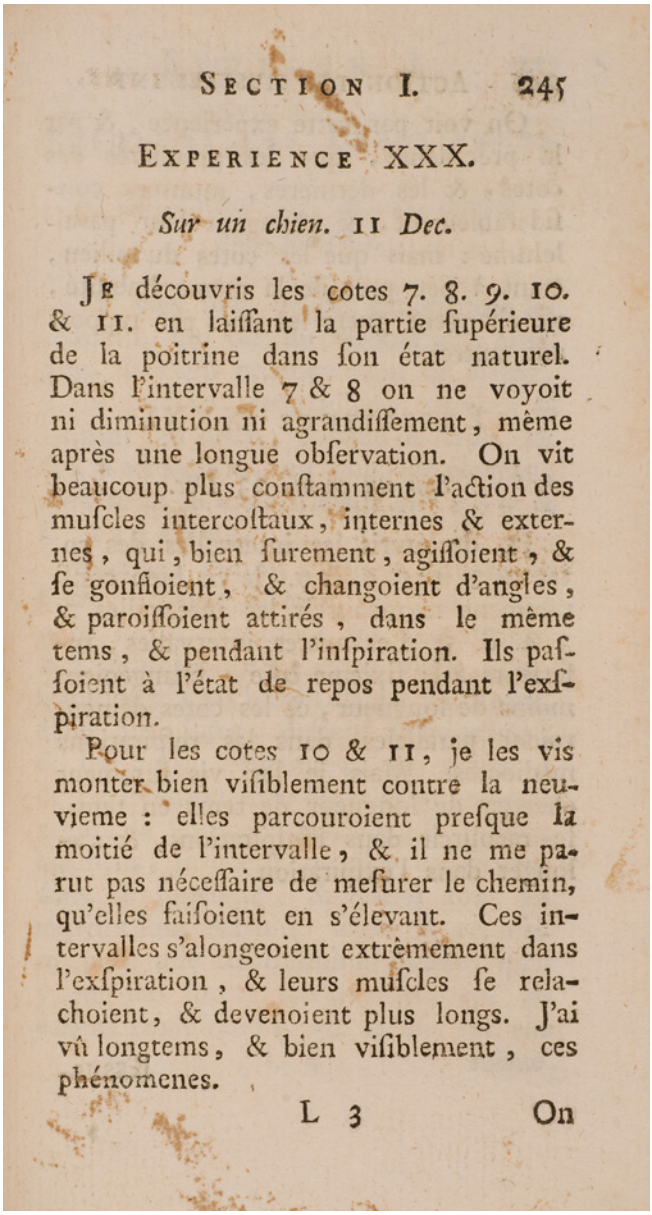
[30] The protocols on respiration are published together with Haller's *Mémoire* on his embryogenetic system of preformation; see Albrecht von Haller, *Sur la Formation du Coeur dans le Poulet; l'Oeil, sur la Structure du Jaune, &c. Second Mémoire. Precis des Observations; suivi de Réflexions sur le Developement: Avec un Mémoire sur plusieurs Phénomènes de la Respiration* (Lausanne 1758), 199–364.

[31] Albrecht von Haller, *Mémoire sur plusieurs Phénomènes importans de la Respiration; Fondé sur les Expériences* (Lausanne 1758), 245: "Pour les cotes 10 & 11, je les vis monter bien visiblement contre la neuvième."

[32] Haller 1758 (note 30), preface, 200: "souffrez que je renouvelle ce témoignage public de mes sentimens. Il vous déplaira moins, depuis que je suis rentré entièrement dans la carrière des expériences."

[33] Ibid.: "Juge éclairé Vous savez mieux que personne, si la cause est décidée par mes travaux: ami prévenu Vous ajouterez du prix à mes efforts."



SECTION I. 245

EXPERIENCE XXX.

Sur un chien. 11 *Dec.*

Je découvris les cotes 7. 8. 9. 10. & 11. en laiſſant la partie ſupérieure de la poitrine dans ſon état naturel. Dans l'intervalle 7 & 8 on ne voyoit ni diminution ni agrandiſſement, même après une longue obſervation. On vit beaucoup plus conſtamment l'action des muſcles intercoſtaux, internes & externes, qui, bien ſurement, agiſſoient, & ſe gonfloient, & changoient d'angles, & paroiſſoient attirés, dans le même tems, & pendant l'inſpiration. Ils paſſoient à l'état de repos pendant l'exſpiration.

Pour les cotes 10 & 11, je les vis monter bien viſiblement contre la neuvieme : elles parcouroient preſque la moitié de l'intervalle, & il ne me parut pas néceſſaire de meſurer le chemin, qu'elles faiſoient en s'élevant. Ces intervalles s'alongeoient extrêmement dans l'exſpiration, & leurs muſcles ſe relachoient, & devenoient plus longs. J'ai vû longtems, & bien viſiblement, ces phénomenes.

L 3 On

Fig. 3. The experimental protocol written on 11 December 1752, from: Albrecht von Haller, *Mémoire sur plusieurs Phénomènes importans de la Respiration; Fondé sur les Expériences* (Lausanne 1758), 245. Burgerbibliothek Bern.

> It is a useful custom, adopted by Boyle and many others nowadays, also by Bonnet, to publish a whole series of experiments in order to confirm a certain ambiguous and not yet accepted opinion about facts. The reader is informed about the controversy and thereby acts himself as a judge and listens to the reports which nature delivers.[34]

Haller introduces the reader as the receiver of the testimony, who, with the use of a legal metaphor, is denoted as a judge. Nature is seen as a witness bringing forth testimonies [testes], while Haller is the editor of those testimonies, the *editor testimoniorum*, as he puts it in the original Latin text. Haller here appears to be using the categories of judicial rhetoric treated in Book I of Aristotle's *Rhetoric*,[35] published approximately in 350 B.C. Aristotle defines rhetoric as an ability to see in each specific case the available means of persuasion (1355b). But this does not mean that rhetoric does not include rational argumentation; on the contrary. Aristotle introduces the important distinction between *technic* and *atechnic* arguments or proofs [pisteis]: "I call *atechnic* those that are not provided by 'us' [i.e. the potential speaker] but are preexisting: for example, witness, testimony from torture, contracts, and such like; and *entechnic* whatever can be prepared by method and by 'us'; thus one must use the former, and invent the latter".[36] As the historian Carlo Ginzburg has pointed out, Aristotle considered the work of Greek antiquarians, who reconstructed the past based mostly on epigraphic evidence, as he did in the *Rhetoric* "by submitting the vocabulary of proof to a close theoretical scrutiny, equating the rational core of rhetoric with proof."[37] In the *Rhetoric* Aristotle discusses the *atechnic* proof in the section devoted to judicial rhetoric, whose temporal dimension was the past, for the speaker in court "always prosecutes or defends concerning what has been done" (1358b).[38] Thus, to

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[34] Albrecht von Haller, *Opuscula Sua Anatomica de Respiratione* (Göttingen 1751), preface, 103: "Utilis mos est & a BOYLEO observatus & a multis, inque iis a Cl. BONNETO, ut tota series experimentorum pro confirmanda ambigua aliqua, necdum recepta, sententia factorum publicetur. Ita Lector ipse gnarus de controversia judex sedet, auditque testes, quos NATURA suppeditet."

[35] Aristotle, *On Rhetoric. A Theory of Civic Discourse*, translated with introduction, notes, and appendices by George A. Kennedy (second edn., New York and Oxford 2007), b. 1, chapters 10–15.

[36] Ibid., b. 1, chapter 2, 38.

[37] Carlo Ginzburg, *History, Rhetoric, and Proof* (Hanover and London 1999), see especially the essay 'Aristotle and History, Once More', 38–53: 43f. On probability in rhetoric and logic, see also Franklin 2001 (note 6), chapter 5, 109–114 (on Aristotle). In his *Appendix* Franklin gives a bibliography on "medieval theories on legal evidence" as well as on "ideas of proof in law in various earlier cultures"; see ibid., 373–383: 374–376.

[38] Aristotle 2007 (note 35), b. 1, chapter 3, 48.

understand the concept of "witness" as an *atechnic* or non-artificial proof, the cultural context of ancient law courts is fundamental: "In democratic law courts, such as those of Athens, the evidence of a witness was taken down at a preliminary hearing and read out by a clerk at the trial rather than being given in person. If the witness was present, he might be asked to acknowledge the testimony."[39] As Ginzburg remarks, this "speaks . . . of a society that, like Athens in the fourth century B.C., heavily relied on written evidence."[40] Thus, with respect to this context, Haller's use of the legal metaphor can be explained:[41] for in scientific inquiry the "preliminary hearing" of Nature, which is the witness that gives the testimonies, consists in the series of experiments that Haller performed and wrote down and that he then edited in textual form. Haller thus uses his experimental protocols as an *atechnic* argument in the sense of ancient judicial rhetoric. In other words, with the publication of his experimental protocols, Haller uses a strategy of ascertainment and validation of knowledge for which he also needs the assent of the competent reader or judge. He must persuade his reader that the "acts" that are explained in the protocols correspond to the truth. In fact Haller, in the preface to the *Opuscula Sua Anatomica*, also addresses the question of his trustworthiness:

> It is beyond question that trustworthiness is required from the editor. I have consciously maintained this trustfulness; no doubts, no contradictions were dissimulated when I saw that the outcome of the experiments did not correspond to my expectations. I only specified those results as something that needs better examination. I easily see that this dispute can be settled only by a result.[42]

By stressing sincerity and honesty, Haller wants to point out that in writing the protocols he did not conceal anything, for as the editor of the testimonies he cannot make the reader believe what does not correspond to the truth. Haller's statement may appear odd and in a certain sense

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[39] Ibid., b. 1, chapter 15, 102 (commentary).

[40] Ginzburg 1999 (note 37), 40, adding that this society also allowed the torture of slaves.

[41] For context-oriented research on metaphors, see Petra Gehring, 'Das Bild vom Sprachbild. Die Metapher und das Visuelle', in Lutz Danneberg, Carlos Spoerhase and Dirk Werle (eds.), *Begriffe, Metaphern und Imaginationen in Philosophie und Wissenschaftsgeschichte* (Wiesbaden 2009), 81–100: 85 and 99f.

[42] Haller 1751 (note 34), preface, 103: "Fidem autem in Editore testimoniorum desiderari facile apparet. Eam religiose servavi, ut ne dubitationes quidem, & contrarios, ut videbantur, votis eventus dissimulaverim, quos unice notulis, ad meliora experimenta remittentibus, declaravi. Eventu autem solo hanc litem definiri posse facile video."

obvious. However, if we consider that sincerity and honesty are basic concepts of the "theory of authority", then Haller's words have a specific sense which will be brought into focus in what follows. The thesis proposed here is that Haller's method of argument in his published protocols is based on an epistemology of credibility and trustworthiness, which itself is founded on the doctrine of authority and testimony. Before entering into the merits of this thesis, we shall first say a few words about the social historiography of science, since the notions of authority and trust play a central role here in descriptions of the moral relations between individuals involved in processes of knowledge production.[43]

It is no coincidence that not only Haller but also the French philosopher and sociologist of science Bruno Latour refers to Boyle's scientific practices in his book *We Have Never Been Modern* (1991). In fact, Latour's characterization of Boyle's scientific practice in seventeenth-century Restauration England is comparable to Haller's situation:

> While a dozen civil wars were raging, Boyle chose a method of argument—that of opinion—that was held in contempt by the oldest scholastic tradition. Boyle and his collegues abandoned the certainties of apodeictic reasoning in favour of a doxa. This doxa was not the raving imagination of the credulous masses, but a new mechanism for winning the support of one's peers. Instead of seeking to ground his work in logic, mathematics or rhetoric, Boyle relied on a parajuridical metaphor: credible, trustworthy, well-to-do witnesses gathered at the scene of the action can attest to the existence of a fact, the matter of fact, even if they do not know its true nature. So he invented the empirical style that we still use today . . .[44]

Although Latour refers to an important essay by Steven Shapin,[45] we know now that the cultural and theoretical background of this metaphor is Aristotle's judicial rhetoric.[46] Moreover, the method of argument adopted by Boyle—and then by Haller—followed a very common practice in the

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[43] Steven Shapin, *A Social History of Truth. Civility and Science in Seventeenth-Century England* (Chicago and London 1994), 27: "To the aggregate of individuals we need to add morally textured relations between them, notions like authority and trust and the socially situated norms which identify who is to be trusted, and at what price trust is to be withheld."

[44] Bruno Latour, *We Have Never Been Modern*, translated by Catherine Porter (Cambridge 1993), 17f. Originally published as *Nous n'avons jamais été modernes. Essais d'anthropologie symmétrique* (Paris 1991).

[45] Steven Shapin, 'Pump and circumstance: Robert Boyle's literary technology', *Social Studies of Sciences* 14 (1984), 481–520.

[46] Barbara J. Shapiro too has pointed out that the virtuosi of the Royal Society adopted the language of the law, but she does not correlate it to Aristotle's judicial rhetoric. See Barbara J. Shapiro, *A Culture of Fact. England, 1550–1720* (Ithaca and London 2000), 141.

sciences of the early modern period and was based on the ancient and late medieval doctrine of authority and testimony. It is uncertain whether Boyle was the inventor of the empirical style, as Latour and Shapin maintain, since the method of empirical proof was already known, for example, to the anatomists of the Renaissance and the sixteenth century. Those anatomists dissected the body not only in the context of academic rituals or for folkloric purposes such as the carnival in Italy, but also to demonstrate the new anatomical knowledge questioning the authority of the ancient medical texts that were accurately read and defended in the academic milieu of the universities. In their new anatomical texts, the Renaissance anatomists also adopted the so-called technology of virtual witnessing which has been described by Steven Shapin and Simon Schaffer in their famous book on Robert Boyle.[47] Further explanation of the complex dynamics between autopsy and authority in sixteenth-century anatomical practice is not possible here.[48] But it should be noted that Shapin and Schaffer did not sufficiently explain that Boyle's method of argument was based on the presuppositions of the doctrine of authority and testimony—the subject of part three of this paper.

The "Doctrine of Authority and Testimony"

It was mentioned above that Hamberger gave credit to the anatomical descriptions of the ancient authors because he assumed that they were credible and trustworthy. In his article published in the *Nouvelle Bibliothèque Germanique*, Haller shows his acquaintance with the authority doctrine, as he states that Hamberger supported the opinion of Galen with a geometrical demonstration. As he puts it:

> It [sc. the geometrical demonstration] made much impression & even those who did not credit M[ister] Hamberger with the right of discovery

[47] Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump. Hobbes, Boyle, and the Experimental Life* (Princeton 1985), chapter 2, 60–65: 62f.: "If one wrote experimental reports in the correct way, the reader could take on trust that these things happened. Further, it would be as if that reader had been present at the proceedings."

[48] But see Simone De Angelis: 'Paduaner Anatomie in Deutschland. Argumentationsweisen, Wissensansprüche und Autorität (1540–1660)', in Emilio Bonfatti, Herbert Jaumann and Merio Scattola (eds.), *Italien und Deutschland. Austauschbeziehungen in der gemeinsamen Gelehrtenkultur der Frühen Neuzeit* (Padua 2008), 17–74; id., 'Darstellungsformen medizinischen Wissens. Einführung', in Ulrich Johannes Schneider (ed.), *Kulturen des Wissens im 18. Jahrhundert* (Berlin and New York 2008), 571–576.

> acknowledged his claim to be the first to demonstrate the opinion of the Ancients.[49]

Physicians and scholars have evaluated the knowledge of ancient authors since the early sixteenth century so that they could read their works in printed and newly translated editions. When writing their own books, these physicians and scholars often adopted ancient knowledge, using it as an argument. From the technical point of view, they used a specific form: the *argumentum ab auctoritate*.[50] The authority argument can be found in textbooks on logic from the medieval and late medieval periods, especially in parts that discuss particular topics and the *loci* doctrine. Petrus Hispanus (c. 1210–1277), for example, who compiled his tract from topics that concerned Boethius and to some extent Aristotle, considers the topos of authority as "the judgement of a wise (scientist) concerning his own science."[51] But the *argumentum ab auctoritate* is above all based on the rhetoric and topics of Aristotle and Cicero, which was later transmitted into the Christian doctrine of authority and testimony.[52] It is based on the basic epistemological distinction between artificial or intrinsic and non-artificial or extrinsic arguments (intrinsic/extrinsic argument corresponds to Cicero's terminology, drawing on Aristotle's *entechnic/atechnic* proofs).[53] The *argumentum ab auctoritate* is—like witness—a non-artificial or extrinsic argument because, according to Cicero, it is not, like the artificial argument "contained in the facts of the case itself", but

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[49] Haller 1748 (note 14), 413: "Elle [sc. la Démonstration Géometrique] fit beaucoup d'impression & ceux-là même qui disputoient à M. H.[amberger] le droit de la découverte, lui accordoient celui d'avoir été le prémier qui eût démontré le sentiment des Anciens."

[50] On theoretical and practical aspects of the doctrine of authority and testimony, see Lutz Danneberg, '*Pyrrhonismus hermeneuticus*, *probabilitas hermeneutica* und hermeneutische Approximation', in Carlos Spoerhase, Dirk Werle and Markus Wild (eds.), *Unsicheres Wissen. Skeptizismus und Wahrscheinlichkeit 1550–1850* (Berlin and New York 2009), 365–436: 365–394 (on Johannes Kepler); see also De Angelis 2008 (note 48), 34–66 (on medicine); id., 'From Text to the Body. Commentaries on *De Anima*, Anatomical Practice and Authority around 1600', in Emidio Campi et al. (eds.), *Scholarly Knowledge. Textbooks in Early Modern Europe* (Geneva 2008), 205–227; id., 'Sehen mit dem physischen und dem geistigen Auge. Formen des Wissens, Vertrauens und Zeigens in Texten der frühneuzeitlichen Medizin', in Herbert Jaumann (ed.), *Diskurse der Gelehrtenkultur in der Frühen Neuzeit. Ein Handbuch* (Berlin and New York 2010), 211–253.

[51] Petrus Hispanus, *Tractatus (called afterwards) Summulae Logicales,* [*between 1230 and 1245*]. *First Critical Edition from the Manuscript with an Introduction by Lambert H. De Rijk* (Assen 1972), Tractatus V (De Loco ab auctoritate), 75: "Auctoritas, ut hic sumitur, est iudicium sapientis in sua scientia."

[52] See Rick Kennedy, *Testimony and Authority in the Art of Thinking* (Rochester and Suffolk 2004), 22–36 (on Cicero and Quintilian).

[53] Ibid., 23. See on this distinction also Danneberg 2009 (note 50), 400–404.

"is obtained from the outside".[54] Thus, when sixteenth-century physicians and scholars used the *argumentum ab auctoritate*, they used a non-artificial argument. Therefore, they accepted an argument that was "obtained from the outside", that is from an ancient author or text. But why did they do so? What did they assume by accepting such arguments? Their actions were completely rational because they assumed that the ancient authors were credible witnesses and were to be trusted, i.e. that their convictions and judgements could be traced back to artificial arguments or autopsy. This form of rationality was based on the counterfactual assumption that the receiver of the testimony would support the same knowledge, were he in the place of the editor of the testimony; in this sense the doctrine of authority and testimony was always reductionist.[55] Thus, in the case under consideration here, Hamberger supported Galen's opinion, while Trew (and others) probably supported that of Haller.

The traceability of the authority argument—from a non-artificial to an artificial argument—is the first established criterion of the authority doctrine. This, however, does not mean that the reduction had to be accomplished each time, since the trustworthiness of the testimony is an essential assumption of the authority doctrine. In fact, the second important criterion is the theory of trustworthiness, which says that trust in the editor of the testimony is based on the assumption that the principle of traceability is fulfilled. The third criterion is the assumption of his competence, which is already mentioned in the textbook of Petrus Hispanus: "Each expert has to be believable in his science",[56] he states. Finally, the fourth criterion is the assumption of his honesty, meaning that he does not consciously tell an untruth. Honesty and competence are the basic principles that must be fulfilled by the editor of testimony in order to make sure that *argumentum ab auctoritate* is acknowledged. These principles form and stabilise authority, a model on which Hamberger drew and which can also be recognised in Boyle's writings, and in a slightly varied form also in Haller's argumentation. Haller in particular adopts a strategy of detailed description of his experiments in his texts, showing his results to the reader and trying to convince him that he is a credible author aiming to establish himself as a new authority. However, there is another aspect of the doctrine of authority and testimony that is closely

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[54] *Topica*, IV, 24: "Quae autem adsumuntur extrinsecus, ea maxime ex auctoritate ducuntur."

[55] See Danneberg 2009 (note 50), 365f.

[56] Hispanus 1972 (note 51), 76: "unicuique experto in sua scientia credendum est".

connected to this strategy which will be analysed in the fourth and final section of this paper.

The Principle of Repeatability as *Moral Evidence*

Let us start with a quotation from Haller's article published in 1748:

> Mr. *Haller* performed this experiment in the presence of witnesses; he repeated it in different animal species and varied it in several ways. Nature stood constantly on his side, the internal intercostal muscles acted vivaciously in inspiration, and flatted and lengthened in expiration. It is very easy to verify this experience in a slightly larger dog. You will see peculiarities that are worthy of being repeated, and it is easy to decide about the process using one's own eyes.[57]

Within this legal metaphor, personified "Nature" is a witness that talks, and Haller, the editor of testimonies, interrogates it by repeating the experiments. As already mentioned above in the context of ancient judicial rhetoric, where this metaphor was present, witnesses might be asked to acknowledge the testimony, if it were present in the law courts. We conclude from this that the interrogation of the witness was not a priority and not even indispensable, since its testimony had been recorded and was deemed to be reliable. The fact that Haller interrogates his "witness" by repeating the experiments signifies the epistemological change in eighteenth-century experimental philosophy. As Haller argues in his article of 1748, in his Göttingen laboratory he created the optimal conditions for examining most new and old physiological knowledge. However, the reiteration of experiments, on which Haller greatly insisted,[58] had not yet been entirely comprehended in its epistemic presuppositions and historical contexts. As we have seen, the doctrine of authority and testimony characterised the epistemic situation of the scientific culture of the sixteenth and seventeenth centuries; in the eighteenth century it becomes

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[57] Haller 1748 (note 14), 426: "Mr. *Haller* fit cette expérience devant bien des témoins, il la répeta dans différentes espèces d'animaux, & la varia de plusieurs manière, la Nature se déclara constamment pour lui, les intercostaux internes agirent avec vivacité dans l'inspiration, ils s'aplatirent & s'allongèrent dans l'expiration. Il est assez aisé de vérifier cette expérience dans un chien un peu plus grand, on y verra d'autres particularités qui valent la peine qu'on les répete, & il est aisé de décider du procès par ses yeux."

[58] See also Otto Sonntag and Hubert Steinke, 'Der Forscher und Gelehrte', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Göttingen 2008), 317–346: 328f. (on Haller's methods of research); see also Steinke 2005 (note 10), 150–152.

part of an empirical epistemology of science. Above all, it throws light on the concept of *moral evidence*, with which experimental scientists judge the level of certainty of their knowledge. This form of evidence is called "moral" because, among other things, it is based on moral categories such as belief, trust and honesty.

Haller's teacher in Leiden, the Newtonian Willem Jacob 'sGravesande (1688–1742), for example, integrates the doctrine of authority and testimony into his discussion of the concept of moral evidence.[59] In his *Introductio ad philosophiam et Logicam continens* [Introduction to philosophy, containing Logic] published in 1736, moral evidence is established on three basic principles: sense perception, the *testimonium*, and analogy. Despite the fact that the epistemic situation as well as the concept of experience had changed since the Middle Ages and the Renaissance, the *testimonium* continued to be discussed in the book on logic, in the section of the book dealing with the issues of ideas and judgements (fig. 4).[60]

Moreover, 'sGravesande, who started his career as a lawyer, explicates the criteria of the *testimonium* doctrine in the language of law and in terms of judicial rhetoric. Among other things, there is the question of the act of human witnessing, the witnesses and judges. He clearly explicates the conditions to which a witness must be held accountable: 1. that the witness has not been deceived; 2. that he does not want to deceive other people; 3. that he expresses clearly his thoughts and that they must be understood clearly by other people.[61] To the criteria already mentioned above—traceability, competence[62] and honesty of the testimony[63]—

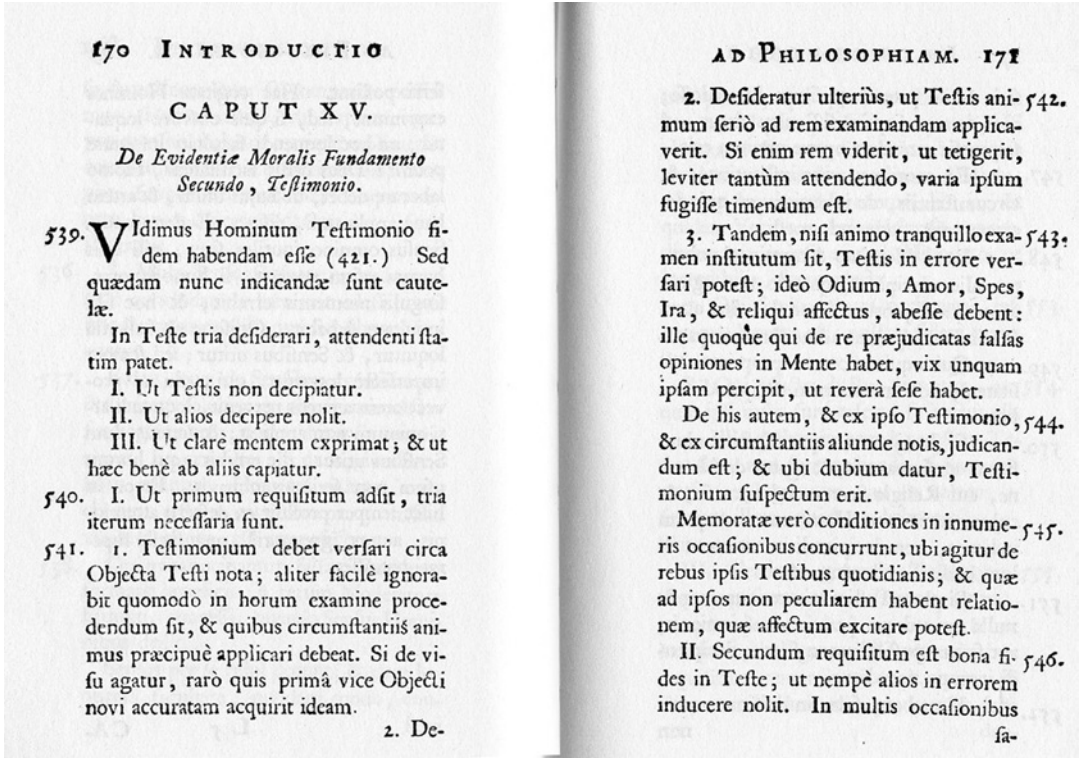
[59] See De Angelis 2003 (note 21), 291–305 (on 'sGravesande and Haller).

[60] Willem Jacob 'sGravesande, *Introduction ad Philosophiam; Metaphysicam et Logicam Continens* (reprint of second edn. 1737, Hildesheim 2001), Liber II, Logica, Pars I, De ideis & Judiciis, Cap. XV (De Evidentiae Moralis Fundamento Secundo, Testimonio), 170–177.

[61] See ibid., 170. I quote from the French edition of his works: id., *Oeuvres Philosophiques et Mathématiques de Mr. G.J. 'sGravesande*, ed. by Jean Nicolas Sébastien Allamand (Amsterdam 1774), Seconde Partie, 77: "Il faut trois conditions dans un Témoin. I. Que le Témoin n'ait pas été trompé. II. Qu'il ne veuille pas tromper les autres. III. Qu'il exprime clairement sa pensée, & qu'on la comprenne de même."

[62] 'sGravesande 2001 (note 60), 170f.; id. 1774 (note 61), 77: "1. Le Témoignage doit rouler sur des choses connues au Témoin; sans cela, il pourra facilement ignorer de quelle manière on doit examiner une telle chose, & à quoi on doit principalement faire attention. S'il s'agit de la vue, par ex: il est rare qu'on se forme une idée exacte d'un objet, qu'on voit pour la première fois. 2. Il faut, outre cela, que le Témoin se soit sérieusement appliqué à examiner la chose, dont il parle. S'il ne l'a, par exemple, vue, ou touchée, qu'en y faisant une légère attention, il est à craindre que plusieurs circonstances n'aient échappées à son examen."

[63] 'sGravesande 2001 (note 60), 171f.; id. 1774 (note 61), 78: "La seconde condition est la bonne foi du Témoin; c'est à dire, qu'il n'ait pas voulu tromper. Dans plusieurs occasions, il est aisé de démeler s'il y a de la sincérité, ou non, dans un Témoignage . . ."



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CAPUT XV.

De Evidentiæ Moralis Fundamento Secundo, Teſtimonio.

539. VIdimus Hominum Teſtimonio fidem habendam eſſe (421.) Sed quædam nunc indicandæ ſunt cautelæ.

In Teſte tria deſiderari, attendenti ſtatim patet.

I. Ut Teſtis non decipiatur.

II. Ut alios decipere nolit.

III. Ut clarè mentem exprimat; & ut hæc benè ab aliis capiatur.

540. I. Ut primum requiſitum adſit, tria iterum neceſſaria ſunt.

541. 1. Teſtimonium debet verſari circa Objecta Teſti nota; aliter facilè ignorabit quomodò in horum examine procedendum ſit, & quibus circumſtantiis animus præcipuè applicari debeat. Si de viſu agatur, rarò quis primâ vice Objecti novi accuratam acquirit ideam.

2. De-

AD PHILOSOPHIAM. 171

2. Deſideratur ulteriùs, ut Teſtis ani- 542.
mum ſeriò ad rem examinandam applicaverit. Si enim rem viderit, ut tetigerit, leviter tantùm attendendo, varia ipſum fugiſſe timendum eſt.

3. Tandem, niſi animo tranquillo exa- 543.
men inſtitutum ſit, Teſtis in errore verſari poteſt; ideò Odium, Amor, Spes, Ira, & reliqui affectus, abeſſe debent: ille quoque qui de re præjudicatas falſas opiniones in Mente habet, vix unquam ipſam percipit, ut reverà ſeſe habet.

De his autem, & ex ipſo Teſtimonio, 544.
& ex circumſtantiis aliunde notis, judicandum eſt; & ubi dubium datur, Teſtimonium ſuſpectum erit.

Memoratæ verò conditiones in innume- 545.
ris occaſionibus concurrunt, ubi agitur de rebus ipſis Teſtibus quotidianis; & quæ ad ipſos non peculiarem habent relationem, quæ affectum excitare poteſt.

II. Secundum requiſitum eſt bona fi- 546.
des in Teſte; ut nempè alios in errorem inducere nolit. In multis occaſionibus

ſa-

Fig. 4. The second fundament of moral evidence: the testimonium, from: Willem Jacob 'sGravesande, *Introductio ad Philosophiam, Metaphysicam et Logicam Continens*. Editio Altera (Leiden 1737), 170f.

'sGravesande adds the criterion of repeatability: A judge himself needs to repeat the questioning of witnesses:

> All these precautions have to be mainly observed with respect to testimonies that must serve justice. The judges must themselves repeat this sort of examination, and as accurately as possible, to avoid witnesses being abused by the style of the law courts and giving false testimony in *bona fide*.[64]

'sGravesande then points out that most of his observations made on testimony can be applied to historians (who also repeatedly examine witnesses) in order to distinguish what is certain from what has to be regarded as doubtful.[65] This is not surprising, if we consider the role of history in the genesis of Aristotle's theory of proof. In fact, Greek historiography has a juridical character comparable to public arbitration:[66] *historía* in the sense of Herodotus, for example, directly means the activity of questioning witnesses and inquiring of those who know from their own experience.[67] But these observations can also be applied to natural scientists, as shown by Haller's publication of his experimental protocols (between 1 February 1746 and 15 November 1757 he performed 117 experiments). What 'sGravesande says on the possible abuse of the witness in the laws courts is repeated by Haller with regard to his experiments: the repetition of the experiments is devoted to elimination of errors but also to avoiding coercion caused by the experimental situation, preventing Nature from expressing itself in a clear manner.[68]

Against the background of the doctrine of authority and testimony it is thus not only possible to reconstruct the criteria of questioning of witnesses, but also the way the language of law and jurisdiction is used

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[64] 'sGravesande 2001 (note 60), 176; id. 1774 (note 61), 80: "Il faut sur tout avoir égard à toutes ces précautions, dans les Témoignages qui doivent servir en Justice. Les Juges doivent eux-mêmes réitérér un pareil examen, & avec tout le soin possible, de peur que les Témoins ne soient abusés par le stile du Barreau, & ne rendent de faux Témoignages de bonne-foi."

[65] 'sGravesande 2001 (note 60), 176f.; id. 1774 (note 61), 80: "La plupart des observations, que nous venons de faire sur le Témoignage, peuvent être appliquées aux Historiens, afin de distinguer ce qui est certain, d'avec ce qui doit être regardé comme douteux."

[66] See Gregory Nagy, 'Mythe et Prose en Grèce Archaïque: L'Aînos', in Claude Calame (ed.), *Métamorphoses du Mythe en Grèce Antique* (Genève 1988), 229–242: 233; see also Carlo Ginzburg, 'Checking the Evidence: The Judge and the Historian', in James Chandler, Arnold I. Davidson and Harry Harootunian (eds.), *Questions of Evidence. Proof, Practice, and Persuasion across Disciplines* (Chicago and London 1994), 290–303.

[67] Bruno Snell, *Die Ausdrücke für den Begriff des Wissens in der vorplatonischen Philosophie* (Berlin 1924), 64; see on *historía* also De Angelis 2010 (note 50), *passim*.

[68] See Albrecht von Haller, *Mémoires sur la nature sensible et irritable des parties du corps animal* (Lausanne 1756–1760), 4 vols., IV: 25; see also Steinke 2005 (note 10), 151f.

in the representation of knowledge of nature in published experimental protocols. However, there is another important aspect to be underlined: the doctrine of authority and testimony explains why Haller represents his experiments in textual form, making them accessible to the public: For him, the judge is the reader of his protocols and it is Nature that the reader—metaphorically speaking—has to investigate. Thus, the protocols have the function of putting the reader in a position of being able to repeat experiments himself and of letting him decide on what to accept as scientific knowledge. The repeatability of experiments is thus the criterion that characterizes the epistemic situation of published texts on experiments in the eighteenth century. In the language of the doctrine of authority and testimony, repeatability is nothing else than the application of the criterion of traceability: Reducing a non-artificial argument, read in a text, to an artificial argument, gained by autopsy or by experiment, is basically possible for anyone and at any time.[69] But, as rhetoric always presupposes a concrete community, which is thus restricted, the public probably was limited to Haller's colleagues and other competent readers in physiology. In fact, the sort of public that Haller principally had in mind and that he addressed in his writings was a public of experts, i.e. people who were able to perform experiments themselves, as the debate on irritability has also shown.[70]

Conclusion

Letting the reader reproduce experiments certainly is a strategy of ascertainment and legitimation of knowledge about nature that is still considered disputable. Yet this strategy also has to do with the honesty and trustworthiness of the author, who may not let the reader believe what does not correspond to the perceived truth. For this reason, the author strives to establish moral evidence for which he also needs the assent of the reader. But this is only the superficial part of the story. The focus on the methodological and epistemological issues of the controversy made it possible to reconstruct the complex structure of Haller's scientific

[69] See also Christian Licoppe, *La formation de la pratique scientifique. Le discours de l'expérience en France et en Angleterre (1630–1820)* (Paris 1996), chapter 3, 92f. Licoppe, however, does not see a link between empirical proof and the ancient doctrine of authority and testimony.

[70] See also Steinke 2005 (note 10), 262f.

argumentation in his published experimental protocols. Evidently, rhetoric is still considered a rational part of an argument, and experience and experiments contain theoretical elements. Thus, the production of a scientific argument, reflected in the structure of experimental protocols, is not only based on socially and morally textured relations between individuals, but also on methods of proof derived from judicial rhetoric as well as on logical and topical tools derived from the ancient doctrine of authority and testimony. Finally, there is a question whether we can learn from the scientific culture of the early modern period: for instance, concerning the "rhetoric of science" in science studies,[71] or concerning the historian of science who really reproduces an experiment as a source of his own experience, where the laboratory notebooks and the (printed) experimental protocols of a scientist are insufficient to reconstruct adequately what happened as a scientific discovery was made.[72] If it is true that "we have never been modern", as Latour maintains, then this question must be answered in the affirmative.

[71] See Bruno Latour and Paolo Fabbri, 'The Rhetoric of Science: Authority and Duty in an Article from the Exact Sciences', *Technostyle* 16 (2000), 115–134.

[72] See Gerd Graßhoff, Robert Casties and Kärin Nickelsen, *Zur Theorie des Experiments. Untersuchungen am Beispiel der Entdeckung des Harnstoffzyklus* (Bern 2000), 7–16: 15f.

NATURAL HISTORY AS COMPILATION. TRAVEL ACCOUNTS IN THE EPISTEMIC PROCESS OF AN EMPIRICAL DISCIPLINE

Bettina Dietz

> Never have so many travel reports appeared, and never has interest in them been greater. . . . in addition, they represent an inexhaustible source of treasure upon which naturalists, geographers, artists and classicists draw; also political writers, economists, and even moralists.[1]

Travel reports were a central medium of information until well into the nineteenth century. Various fields of eighteenth-century knowledge—in particular, geography, natural history, the history of mankind, statistics, and anthropology—drew their data from the corpus of travel writing that expanded enormously during the second half of the eighteenth century. The project of a history of mankind,[2] which aimed to define the level of civilization of all the peoples in the world and locate them within a framework of cultural development, drew its information specific to each country almost exclusively from this source. Practically all the available *itineraria* (contemporary travel and guide books) went into the making of Johann Gottfried Herder's *Ideen zu einer Philosophie der Geschichte der Menschheit*, where whole passages are quoted almost without modification.[3] Natural history, however, which aimed to achieve worldwide

[1] Gilles Boucher de La Richarderie, *Bibliothèque universelle des voyages, ou notice complète et raisonnée de tous les voyages anciens et modernes dans les différentes parties du monde, publiés tant en langue française qu'en langues étrangères* . . . (reprint of Paris 1808 edition, Genève 1970), 6 vols., I: V.

[2] On the history of mankind see Michèle Duchet, *Anthropologie et histoire au siècle des Lumières* (Paris 1971); Helmut Zedelmaier, *Der Anfang der Geschichte. Studien zur Ursprungsdebatte im 18. Jahrhundert* (Hamburg 2003); Thomas Nutz, *"Varietäten des Menschengeschlechts". Die Wissenschaften vom Menschen in der Zeit der Aufklärung* (Köln et al. 2009).

[3] See references to the relevant travel authors in the commentary on Johann Gottfried Herder, *Ideen zur Philosophie der Geschichte der Menschheit* [orig. 1784–1791], ed. by Wolfgang Proß, vol. III/2: *Kommentar* (München and Wien 2002), 911–972; as well as Hans-Wolf Jäger, 'Herder als Leser von Reiseliteratur; Appendix: Von Herder in den "Ideen" erwähnte Itinerare und historisch-geographische Schriften', in Wolfgang Griep and Hans-Wolf Jäger (eds.), *Reisen im 18. Jahrhundert* (Heidelberg 1986), 181–189. On how French historians of mankind worked with travel literature, see Duchet 1971 (note 2), 65–136.

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registration, description and classification of flora, fauna and minerals, developed probably the greatest need for global information. The gap between the empirical claims of natural history to operate on the basis of eyewitness accounts and the difficulty of delivering on this could often be bridged only by consulting travel reports. Complementing the archives of objects assembled in the cabinets of natural history collections, they served as stores of essential information, on which natural history had to rely.

The following analysis of how natural historians worked with *itineraria* and topographies will concentrate on the process of procuring and processing information. The first section will introduce the navigation aids that allowed eighteenth-century natural historians to orient themselves and find information in the expanding contemporary book market and, in particular, gain access to the corpus of travel literature: first, specialist bibliographies covering either the whole spectrum of natural history themes or individual specific branches; secondly, catalogues of private libraries; and thirdly, bibliographies and compilations of travel reports on various regions and thematic areas. The second section will discuss the problem, relevant to both writers and readers of natural history, of establishing the authenticity of the information collected in this way. The final section will trace the reading of *itineraria* and topographies, the creation of excerpts, and the compilation of an information base that legitimated an author's own arguments into the working processes of individual natural historians.

Travel Reports and the Library of Natural History

The aim of the *Bibliothèque universelle des voyages* quoted above, according to the editor, was provisionally to mark the end of the exponential growth in the number of travel reports being produced. It presented itself as a compendium of all the travel literature that had so far been published, and thus as the ultimate source of information on all questions raised by a desire to know about countries and peoples. Given the huge number of travel reports already available and the new ones constantly being published, the introduction explains that this collection includes only accounts that provide information on the climate, flora, fauna, population, topography, ways of life, trade and military affairs of the countries travelled to, without restricting themselves to just one of these aspects. Explicitly excluded are the many travel accounts that concentrated on

only one area of knowledge, especially geography, individual branches of natural history, or classical studies.[4]

The genealogy of earlier projects which Boucher de La Richarderie presents in his introduction and which he sees his compilation as completing discusses the many previous attempts to organize travel literature and thus make it available for systematic use. Against the background of a long list of work which he assesses as being more or less full of gaps, only a few titles stand out that the author deems worthy of praise as being generally useful. Completeness appears to be an impossibility.[5] He lists the whole spectrum of compilations published in French, English, Dutch, Spanish and German, organized by language and with comments on the selection of texts, quality of illustrations and price. These compilations, as the wealth of references to them in the footnotes of natural history works reveal, served practitioners of natural history as an obligatory source of information, and will be discussed in what follows, taking the *Histoire générale des voyages*, edited by Prévost, as an example.

English collections of travel writing dating from the late sixteenth and early seventeenth centuries by Richard Hackluyt,[6] Samuel Purchas,[7] John Churchill,[8] and John Harris,[9] provided the foundation for Thomas Astley's *New General Collection of Voyages and Travels*,[10] published between 1745 and 1747. This was one of the first comprehensive compilations with a critical commentary, and provided a model for the monumental undertaking by the Abbé Prévost, which was intended as its French counterpart. The *Histoire générale des voyages* began as a translation of the English model. What emerged was a compilation, consisting of original passages grouped thematically, "which presents both a system of modern geography

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4 Ibid., XVI.

5 Cf. Boucher de La Richarderie 1970 (note 1), VII.

6 Richard Hackluyt, *The Principal Navigations, Voyages, Traffiques and Discoveries of the English Nation* (London 1598–1600), 3 vols.; see also G.R. Crone and R.A. Skelton, 'English Collections of Voyages and Travels, 1625–1846', in Edward Lynam (ed.), *Richard Hackluyt and His Successors* (London 1946), 63–140.

7 Samuel Purchas, *Purchas His Pilgrimes* (London 1625), 5 vols.

8 John Churchill, *A Collection of Voyages and Travels, Some Now First Printed from Original Manuscripts, Others Now First Published in English* . . . (London 1732), 8 vols.

9 John Harris, *Navigantium atque itinerantium bibliotheca, or a Compleat Collection of Voyages and Travels* (London 1705), 2 vols.

10 Thomas Astley, *A New General Collection of Voyages and Travels: Consisting of the Most Esteemed Relations which Have Been Hitherto Published in Any Language* (London 1745–1747), 4 vols.

and history, and a corpus of travel descriptions, and . . . depicts the present condition of all nations."[11]

When Astley's *New General Collection* ceased publication after the seventh volume, Prévost continued his undertaking without a model. Volumes eight to eleven were largely based on the original method, but thereafter he followed his own ideas, which he explained in the foreword to the twelfth volume. The source criticism called for there was provided by the juxtaposition of observations of the same object by various travellers, whose convergence or divergence made it possible to rank the quoted authors in a hierarchy of reliability. Amédée Frézier's report of his journey to Chile and Peru published in 1716, for example, leads the rankings of writers on Central and South America created in this way.[12] Prévost preferred Frézier's description of Peru to the better-known one by Garcilaso de La Vega,[13] followed by Charles Marie de La Condamine,[14] and Antonio de Ulloa.[15]

Prévost had explicitly explained that in many cases he did not reproduce travel reports in the original, but in a version which he had stylistically purified; his compilation was criticized from various sides,[16] and the publication of newer travel reports increasingly compromised its topicality.

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[11] Antoine-François Prévost, *Histoire générale des voyages, ou nouvelle collection de toutes les relations de voyages* . . . (Paris 1746–1789), 20 vols., I: V. The English and the French versions were quickly translated into German by Johann Joachim Schwabe, *Allgemeine Historie der Reisen zu Wasser und zu Lande; oder Sammlung aller Reisebeschreibungen, welche bis itzo in verschiedenen Sprachen von allen Völkern herausgegeben worden, . . .; durch eine Gesellschaft gelehrter Männer im Englischen zusammengetragen, und aus demselben [und dem Französischen] ins Deutsche übersetzt* (Leipzig 1747–1774), 21 vols. See Peter Boerner, 'Die großen Reisesammlungen des 18. Jahrhunderts', in Antoni Maczak and Hans Jürgen Teuteberg (eds.), *Reiseberichte als Quellen europäischer Kulturgeschichte. Aufgaben und Möglichkeiten der historischen Reiseforschung* (Wolffenbüttel 1982), 65–72; Horst Walter Blanke, 'Wissen—Wissenserwerb—Wissensakkumulation—Wissenstransfer in der Aufklärung. Das Beispiel der "Allgemeinen Historie der Reisen" und ihrer Vorläufer', in Hans-Jürgen Lüsebrink (ed.), *Das Europa der Aufklärung und die außereuropäische koloniale Welt* (Göttingen 2006), 138–156.

[12] Amédée Frézier, *Relation du voyage de la mer du Sud aux côtes du Chily et du Pérou* (Paris 1716).

[13] A French translation of the Spanish version was published as: *Le commentaire royal, ou l'histoire des Incas roys du Peru, escritte en langue peruvienne . . . traduitte sur la version espagnolle* . . . (Paris 1633).

[14] Charles Marie de La Condamine, *Relation abrégée d'un voyage fait dans l'intérieur de l'Amérique méridionale, depuis la côte de la mer du sud jusqu'aux côtes du Brésil et de la Guiane, en descendant la rivière des Amazones* (Paris 1745).

[15] Antonio de Ulloa, *Relación histórica del viage a la América meridional* (Madrid 1748), 5 vols.

[16] See Duchet 1971 (note 2), 85 and 107.

Nevertheless, even in the late eighteenth century, his *Histoire générale des voyages* was still a much used and indispensable source of information for natural history. The fact that the title crops up in the correspondence of mainly French natural historians and in the footnotes of their publications[17] shows how closely they worked with it. Nor did the publication of an abridged version[18] squeeze the original *Histoire générale des voyages* in twenty quarto volumes off the market. Carefully produced visual material, maps and plans gave it the status of an illustrated encyclopedia and ensured that demand for it continued.

The explosive growth in both general travel accounts and travel literature that specialized in natural history topics not only drove up the number of compilations but also increased demands on the data-processing capacity of those compiling subject bibliographies. In 1716 Johann Jakob Scheuchzer's *Bibliotheca scriptorum historiae naturalis*, a bibliography encompassing all subfields of natural history, could still claim to list titles on all three natural kingdoms (plants, animals and minerals) and all regions.[19] Writers of travel accounts and descriptions of countries account for about one third of the authors listed according to continents. Later bibliographies of natural history reduced their scope to particular branches of the subject. The year 1736 saw the publication of Linnaeus's *Bibliotheca botanica* in one volume;[20] in 1771 the Swiss botanist Albrecht von Haller published a project of the same name in two volumes.[21]

At a time when scientific books from abroad could be obtained only through an individual's personal network of contacts or not at all,[22] printed catalogues of big private libraries of natural history were not only status symbols or a medium for announcing forthcoming auctions, but also served as international bibliographies on specialist subjects. In 1798 the catalogue of one of the greatest private collections of books on natural history in the eighteenth century was published, still in the lifetime of its

[17] See below.

[18] Jean-François de La Harpe, *Abrégé de l'histoire générale des voyages, contenant ce qu'il y a de plus remarquable, de plus utile et de mieux avéré dans les pays où les voyageurs ont pénétré . . .* (Paris 1780–1801), 32 vols.

[19] Cf. Johann Jakob Scheuchzer, *Bibliotheca Scriptorum Historiae Naturali omnium Terrae Regionum inservientium* (Zürich 1716).

[20] Carl von Linné, *Bibliotheca botanica recensens libros plus mille de plantis huc usque editos* (Amsterdam 1736).

[21] Albrecht von Haller, *Bibliotheca botanica, qua scripta ad rem herbariam facientia a rerum initiis recensentur* (Zürich 1771–1772), 2 vols.

[22] On this point, see Bettina Dietz, 'Making natural history: Doing the Enlightenment', *Central European History* 43 (2010), 25–46.

owner: the *Catalogus Bibliothecae Historico-Naturalis Josephi Banks*. Of its five volumes, the first is dedicated to general writing on natural history.[23] The publication series of the academies and learned societies of the whole of Europe are followed here by eighty-two densely printed pages under the heading "Itineraria et Topographiae". The obligatory travel collections and circumnavigations of the world are listed, as well as travel reports dating from about the last two hundred years, sorted by continent and destination, and complete listings are provided for a number of regions. The eight titles in the section headed "Itineraria et Topographiae Africae Australis", for example, include a number of lesser-known writings as well as the indispensable reference works on South Africa: Peter Kolb's description of the Cape of Good Hope,[24] in a Dutch version; Nicolas de la Caille's *Journal historique d'un voyage fait au Cap de Bonne-Espérance*;[25] descriptions of the Cape and surrounding regions by Anders Sparrman,[26] a pupil of Linnaeus; and François Levaillant's *Voyage dans l'intérieur de l'Afrique, par le Cap de Bonne Esperance*.[27] Similarly complete is the considerably longer section entitled "Itineraria et Topographiae Imperii Russici".[28]

The catalogue by the Berlin natural historian Friedrich Heinrich Wilhelm Martini,[29] published in 1779, provided a model in German-

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[23] Jonas Dryander, *Catalogus Bibliothecae Historico-Naturalis Josephi Banks* (reprint of London 1798 edn., Amsterdam 1966), 5 vols.

[24] Peter Kolb, *Caput Bonae Spei hodiernum, das ist, Vollständige Beschreibung des Africanischen Vorgebürges der Guten Hoffnung: worinnen in dreyen Theilen abgehandelt wird, wie es heut zu Tage nach seiner Situation und Eigenschafft aussiehet; ingleichen was ein Natur-Forscher in den dreyen Reichen der Natur daselbst findet . . .* (Nürnberg 1719).

[25] Paris 1763.

[26] The following are specified: "Andreas Sparrmann, An account of a journey into Africa from the Cape of Good-Hope. Philosoph. Transact. Vol. 67. pp. 38–42; id., Resa tilll Goda Hopps udden, södra pol kretsen och omkring jordklotet, samt till Hottentot-och Cafferlanden, åren 1772–1776. Stockholm, 1783; id., Reise nach dem Vorgebirge der Guten Hoffnung, den südlichen Polarländern und um die Welt, hauptsächlich aber in den Ländern der Hottentotten und Kaffern, frey übersetzt von Chr. Heinr. Groskurd, mit einer Vorrede von Ge. Forster, Berlin, 1784; id., A voyage to the Cape of Good Hope, towards the antarctic polar circle, and round the world, but chiefly into the country of the Hottentots and Caffres, London 1785." Dryander 1966 (note 23), I: 131.

[27] Paris 1790.

[28] See Dryander 1966 (note 23), I: 118–121. See also the following catalogues of private libraries specializing in natural history: *Verzeichniß des Vorraths von Büchern, physikalischen und mathematischen Instrumenten auch Naturalien . . . J.Ch.P. Erxleben* (Göttingen 1777); *Catalogus bibliothecae Bornianae publica auctione vendetur* (Wien 1791); *Verzeichniß der hinterlassenen Bücher von Georg Forster* (Mainz 1797); *Verzeichniß der vom . . . Blumenbach nachgelassenen Bücher* (Göttingen 1840).

[29] *Bibliotheca Martiniana sive catalogus librorum varii argumenti, praecipue tamen ad historiam naturalem spectantium* (Berlin 1779).

speaking Europe, and a number of follow-on projects referred to it. In 1782, for example, Joseph Paul von Cobres from Augsburg, a collector of natural objects, published a systematic catalogue of his library in two thick octavo volumes.[30] Most of the titles listed in the section Books and Writings Ancillary to Natural History [Zur Naturgeschichte gehörige Hilfsbücher und Schriften] come under the headings "travel reports" and "musea" (i.e. inventories of collections). Cobres' holdings of *itineraria* comprise the canon of international travel literature which, organized according to the format of the books, fills twenty pages.[31] Among those in quarto format we find a selection of the older and more recent titles which formed the core holdings of any library of natural history: Seventeenth-century Oriental journeys by Jean Baptiste Tavernier[32] and Adam Olearius,[33] Hans Sloane's Caribbean voyage,[34] Joseph Pitton de Tournefort's *Relation d'un voyage du Levant*, held up by contemporaries as a model botanical journey,[35] Albrecht von Haller's *Iter Helveticum*,[36] Samuel Gottlieb Gmelin's *Reise durch Rußland*,[37] and various writings by Peter Forsskål, a pupil of Linnaeus who travelled in Arabia. Among the books in octavo format we find La Condamine's canonical *Relation abrégée d'un voyage fait dans l'Intérieur de l'Amérique Méridionale*,[38] *Reise nach Palästina* by Fredrik Hasselquist, another pupil of Linnaeus,[39] Linneaus's *Reisen durch Oland und Gothland* (first published

[30] J.P. Cobres, *Deliciae Cobresianae. Büchersammlung zur Naturgeschichte* (Augsburg 1782), 2 vols. The *Naturforschende Gesellschaft in Halle* bought Cobres' catalogue for its library. See *Abhandlungen der Hallischen Naturforschenden Gesellschaft* 1 (1783), XVII.

[31] Cobres 1782 (note 30), I: 78–97.

[32] *Les six voyages de Jean Baptiste Tavernier . . . en Turquie, en Perse, et aux Indes . . .* (Paris 1678), 2 vols.

[33] Adam Olearius, *Offt begehrte Beschreibung der Newen orientalischen Reise* (Schleswig 1646).

[34] Hans Sloane, *A Voyage to the Islands Madera, Barbados, Nieves, S. Christopher and Jamaica* (London 1707–1725), 2 vols.

[35] Joseph Pitton de Tournefort, *Relation d'un voyage du Levant fait par ordre du Roy, contenant l'histoire ancienne et moderne de plusieurs isles de l'Archipel, de Constantinople, des côtes de la Mer noire, de l'Arménie, de la Géorgie . . .* (Paris 1717), 2 vols.

[36] Göttingen 1740.

[37] Samuel Gottlieb Gmelin, *Reise durch Rußland zur Untersuchung der drey Natur-Reiche* (St. Petersburg 1770–1784), 4 vols.

[38] Paris 1745.

[39] Hasselquist travelled to Egypt and Palestine in 1749, searching for biblical plants and animals. He died on the expedition. His notes, which were sent back to Sweden, were edited by Linnaeus and published in 1757. Fredrik Hasselquist, *Iter Palaestinum eller resa til heliga landet* (Stockholm 1757).

in Swedish; German, Halle 1764),[40] and Peter Simon Pallas's *Reise durch verschiedene Provinzen des Russischen Reichs*.[41]

Strategies of Authentification

The main function of the travel report as a medium for information whose reliability, as a rule, the reader could check only indirectly by comparing texts, meant that the quality of a travel writer's work could attain epistemological significance. What was expected of him; what did he expect of himself?

A fixed arsenal of arguments or procedures of authentification in various combinations and densities are always found where travel writers created their own personal guarantee of reliability, or where a demand was voiced, either in reviews or in general reflections on the information value of travel literature, for an assurance of the facticity of their observations. In the second half of the eighteenth century, the heroes of travel reportage relevant to natural history, whose work was repeatedly described as exemplary, were mostly French and German authors: Michel Adanson,[42] Pierre Poivre,[43] Johann Reinhold Forster,[44] Peter Simon Pallas and Samuel Gottlieb Gmelin. But older texts such as the reports of the Oriental and Japanese journeys undertaken by Joseph Pitton de Tournefort, Jean Chardin and Engelbert Kaempfer, found in every travel compilation, specialist bibliography and library of the eighteenth century, were also reference works.

Thus the posthumous edition of Kaempfer's *Geschichte und Beschreibung von Japan*—the journey had taken place in 1690–1692; the report was first published in 1727—could refer to the mutual authentication of two authorities, Kaempfer and Gmelin:

> Kaempfer examined the well-known sites of the latter [the "Absheron pensinsula" near Baku, B.D.] so closely that his descriptions of the same (in

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[40] *Herrn Carls von Linné . . . Reisen durch Oeland und Gothland; welche auf Befehl der hochlöblichen Reichsstände des Königreichs Schweden im Jahr 1741 angestellt worden; aus dem Schwedischen übersetzt von J.C. Schreber* (Halle 1764), 2 vols. (first published in Swedish 1745). There is no contemporary English translation.

[41] Frankfurt/M. 1771–1776. There is no contemporary English translation.

[42] Michel Adanson, *Histoire naturelle du Sénégal. Histoire des Coquillages* (Paris 1757).

[43] Pierre Poivre, *Voyages d'un philosophe, ou observations sur les moeurs et les arts des peuples de l'Afrique, de l'Asie et de l'Amérique* (Yverdon 1768).

[44] Johann Reinhold Forster, *Observations Made During a Voyage Round the World, on Physical Geography, Natural History and Ethnic Philosophy* (London 1778).

> the Amoenitates exot. pp. 262–286) were the most complete and correct not only at the time when they were published, but to some extent still deserve these epithets today. Indeed, later travel writers have mostly only been able to confirm Kaempfer's reports and have been able to add little that is new to them. And is it not glorious for our writer that almost one hundred years later, a man who recommends himself through the completeness and correctness of his own travel reports gives him this testimonial. [The relevant footnote reads: "S.J.G. Gmelin's travels through Russia, Part. 3, in several locations", B.D.][45]

Travel writers and those reporting for expeditions were expected to reproduce what they had seen; their main sense organ was the eye. The nature of the project of collecting data on natural history and geography, and from the end of the eighteenth century increasingly also on anthropology, meant that the gaze of the traveller was focused on units of information intended to plug the gaps in a constantly growing repertoire of knowledge. This task of observing with the aim of collecting data complemented the duty to accumulate material, which required those on expeditions to collect natural and other objects from all over the world. At the level of representation, a rhetoric of "unadorned information" corresponded to the ideal of the eye-witness report. The professed renunciation of an elegant style became a criterion for, and guarantee of, the reliability of the content. Peter Simon Pallas, for example, prefaced his report on Russia, celebrated by contemporaries as exemplary, with the following *captatio benevolentiae*:

> I want . . . to keep the most necessary things that I have to report as short as possible. As I have tried to take notice of everything, I hope that my work will not be placed among the superfluous and spurious writings, even if it lacks elegance and other forms of perfection. Reports of unknown regions, like most of those I have described so far, are pleasing to knowledgeable readers, even if the way in which they are written is only average. I believe that the main quality a travel report needs is reliability; I have attempted . . . to approach this as closely as possible and have sought to be faithful to the truth.[46]

Justifications of this sort point to the significance of travel reports as the basic source for the basic source for disciplines such as natural history,

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[45] Engelbert Kaempfer, *Geschichte und Beschreibung von Japan aus den Originalhandschriften des Verfassers*, ed. by Christian Wilhelm Dohm (Lemgo 1777–1779), 2 vols., I: XXIV.

[46] Peter Simon Pallas, *Reise durch verschiedene Provinzen des Rußischen Reiches* (first edn. St. Petersburg 1771–1776, second edn. St. Petersburg 1801), 3 vols., I: unpaginated preface.

the history of mankind, geography, and later anthropology as well. The value of the works synthesized from them, or argued on the basis that they provided, depended on the reliability of the information they contained. This relationship of dependence forced consumers as well as producers of travel literature to engage in close source criticism that reflected on the precarious status of what was reported. Substantive controversies often led to heated exchanges about the quality of the information which the opposing sides drew upon, in other words, about the travel authors selected in each case.

A good example of this is provided by the debate between Cornelius de Pauw, Dutch author of *Recherches philosophiques sur les Américains*,[47] and his opponent, Antoine Joseph de Pernety, concerning the physical appearance and character of the original inhabitants of America, a question located at the intersection between the natural history of man and the history of mankind. Pernety had rejected de Pauw's argument that an unfavourable climate was responsible for the Indians' physical, intellectual and emotional weakness, and thus their backwardness in terms of civilization.[48] In his reply to this attack, de Pauw argued that Pernety's claim was not based on the work of any travel writers, whereas he himself could refer to an authority such as La Condamine, from whose *Voyage sur l'Amazone* he quotes a whole-page description of the Indian "fonds de caractère" which is identical with his own argument.[49] He deprives his opponent's arguments of any potential plausibility by raising the suspicion that he has never even read this description of the Amazon.[50]

The second main point of debate was whether or not a race of Patagonian giants (also known as Géants de la Magéllanique) existed on the southern tip of South America, a question which controversially exercised the natural history literature until the second half of the eighteenth century.[51] Whereas de Pauw consigned the Patagonian giants to the realm

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[47] Berlin 1768–1769.

[48] Antoine Joseph Pernety, 'Dissertation sur l'Amérique & les Américains', in Cornelius de Pauw, *Recherches philosophiques sur les Américains. Nouvelle édition, augmentée d'une dissertation critique par Dom Pernety, & de la défense de l'auteur des Recherches contre cette dissertation* (Berlin 1771), 2 vols., II.

[49] Cornelius de Pauw, *Défense des recherches philosophiques sur les Américains* (Berlin 1770), 31f.

[50] Ibid., 35.

[51] On the controversial existence of giants discussed in the light of a controversy that had been carried on for more than two hundred years, sparked by a spectacular find of fossils in 1613, see Bettina Dietz, 'Vom Giganten zum Elephanten. Kontroversen über Fossilien, 1610–1820', *Archiv für Kulturgeschichte* 85 (2003), 277–302.

of traditional but untenable travel myths, Pernety, referring to a number of travel writers, insisted on their existence. In his own defence, de Pauw was forced to undermine the credibility of a statement legitimated by six travel reports. Examining the statements on the height of the Patagonians made in the reports by Pigafetta,[52] Byron,[53] Harris, Argensola,[54] and two unidentifiable authors called "Jantzon" and "Giraudais",[55] whom Pernety cites, de Pauw discredited them on the basis of the obvious differences between them.[56]

And why, de Pauw asked, had no Patagonian ever been produced in the flesh so far? After all, he pointed out, natural oddities from all over the world had been shown in Europe for centuries. He went on to provide a long list of human and animal exhibits whose display in Europe had put a quick end to debates about the possibility of their existence. This list juxtaposed rhinoceroses, a number of Chinese people, a putatively hermaphrodite African woman, a number of elephants, hippopotamuses, toads from Surinam that allegedly gave birth through their backs, two people from Greenland, crocodiles, rattlesnakes and a Hottentot with one testicle.[57]

The question of the height of the Patagonians could not be considered finally resolved by Pauw's refutation. In 1777, a chapter on the state of the debate on the Patagonian question was published in the fourth supplementary volume of Buffon's *Histoire naturelle*, among the appendixes to *Variétés dans l'espèce humaine*. Once again the whole genealogy of the reports of their existence in travel reports was rehearsed, starting with the compilation by Harris, who had coined the term "Patagonians", and continuing with Spilbergen, Frézier, le Cat, Acuña, Byron, de Brosses, de Pauw's discussion of heights mentioned above, and right up to the most

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[52] Antonio Pigafetta, *Relazione del primo viaggio intorno al mondo*, ed. by Mario Pozzi (Vicenza 1994).

[53] John Byron, *The Narrative of the Honourable John Byron … containing an account of the great distresses suffered by himself and his companions on the coast of Patagonia, from the year 1740, till … 1746* (London 1768).

[54] Bartholomé Leonardo de Argensola, *Conquista de las islas Malucas* (Madrid 1609); published in French as: *Histoire de la conquête des isles Moluques par les Espagnols, par les Portugais, et par les Hollandais* (Amsterdam 1706).

[55] The fact that the spelling of names had not yet been standardized and that non-French family names were written down as they sounded when pronounced in French ("Byron" becames "Biron"; "Harris" was written as "Aris") makes identification even more difficult.

[56] Cf. De Pauw 1770 (note 49), 188f.

[57] See ibid., 183.

contemporary authorities on the question, Louis Antoine de Bougainville[58] and his companion Philibert Commerçon. Both confirmed that they had seen people of unusual height and corpulence on the southern tip of South America, but believed that they could be considered as being right at the top of the spectrum of known human body sizes. Commerçon protested against the circulating superlatives observing, among other things, that in this region there were only small horses which could never carry a giant.[59] Bougainville, "célèbre voyageur", suggested that in his case, the impression of giants had been created less by height alone than by the extraordinarily powerful and bulky Patagonian stature.

A discussion summing up as many statements on a controversial natural history phenomenon as possible, drawn from the entire corpus of travel literature, was the necessary precondition for one's own opinion to be taken seriously. Even Buffon, the main authority in the field of the natural history of man in the 1770s,[60] followed this path when he set an upper limit to the not yet precisely defined spectrum of potential human height as measuring between nine and ten feet—like the Patagonians:

> It can be deduced from my work [Histoire naturelle, B.D.] that I have always doubted the existence of this putative race of giants. One cannot be too careful in treating exaggerations of this sort, especially when we are dealing with something newly discovered. Nonetheless, I believe that the differences in the heights claimed for the Patagonians by various travellers can be attributed to the fact that they are all speaking of different individuals. If we compare all the information that we have, the result is that between 22° and 40° to 45° latitude S a human race exists that is bigger and stronger than any other in the world. These people are not all giants, but they are all taller, and much broader and stronger than other human beings. And as giants seven or seven and a half feet tall occur in almost all climates, it is not surprising that there are some who are nine or ten feet tall among the Patagonians.[61]

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[58] Louis Antoine de Bougainville, *Voyage autour du monde par la frégate du Roi la Boudeuse, et la flûte l'Etoile, en 1766, 67, 68 & 69* (Paris 1772).

[59] Cf. Georges-Louis Le Clerc, Comte de Buffon, *Histoire naturelle, générale et particulière. Supplément* (Paris 1774–1789), 7 vols., IV (1777): 512–525.

[60] On this point see Bettina Dietz and Thomas Nutz, 'Naturgeschichte des Menschen als Wissensformation des späten 18. Jahrhunderts. Orte, Objekte, Verfahren', *Zeitschrift für Historische Forschung* 32 (2005), 45–70.

[61] Buffon 1774–1789 (note 59), IV (1777): 525. The anthropological instructions prepared by Cuvier for a French expedition under the direction of Bougainville (son), sent out in 1824 to circumnavigate the world, end: "Si l'on touche à la côte des Patagons il serait de la dernière importance de se procurer le squelette ou au moins la tête et quelques os des plus grands individus de cette race afin d'en finir les chimerrions." [Georges Cuvier], *Note sur les objets de zoologie auxquels on prie . . . de donner principalement attention*, Bibliothèque Centrale du Musém d'Histoire Naturelle, Paris [hereafter BCMHN], MS 2283, 3r.

Natural History as Compilation

One way to bridge the gap between the claims of natural historians to have witnessed objects personally and the limited opportunities to do this because of the incompleteness of local holdings of natural objects was to draw upon travel reports. This meant that authenticating natural history accounts was one of the tasks that fell to travel authors. While the authors of natural history travel accounts or descriptions of countries attested to their own or each other's reliability, using the authentification procedures outlined above, the scholarly user had a duty to engage in explicit or implicit source criticism by either comparing a new report with the existing literature, or extrapolating passages from material that was generally considered true and using them to test the reliability of the new report. As natural historians who travelled long distances were, on the whole, the exception, the indispensable information content of travel literature could, in this way, be integrated into the project of natural history that defined itself as a science of observation.

The clearest evidence of the indispensability of the material extracted from travel reports is provided by the corpus of natural history footnotes. The references listed there document in a serial fashion the extent to which the universal claims of surveys or systematic accounts drew upon this source of information spanning the globe. The natural history of man, in particular, long depended almost exclusively on the older and more recent travel literature. Unlike the natural history of plants and animals, which could draw upon a large and constantly growing archive of living or prepared material, the natural history of man did not at first have the object of its investigation to hand, or only exceptionally. It operated without visual material until, from the last third of the eighteenth century on, the procedures of anthropometry and comparative anatomy provided more empirical data.[62]

It is remarkable, for example, that Buffon's overview of the *Variétés dans l'espèce humaine*, highly rated by contemporaries, was put together entirely on the basis of information drawn from travel literature. Descriptions, some quoted verbatim although not always necessarily from the most recent travel reports, form the units from which this text is constructed. At the time of publication of the *Variétés* (1749), the eighteenth-century boom in expeditions was just beginning, so that some of the

[62] Dietz and Nutz 2005 (note 60); Nutz 2009 (note 2), 119–141.

central passages are drawn from the older literature. The description of the inhabitants of the North Pole, for example, is taken almost word for word from the *Six voyages de Jean-Baptiste Tavernier… qu'il a fait en Turquie, en Perse, et aux Indes*, which was almost 100 years old at the time.[63]

In 1777, a good twenty-five years after the first publication of his *Variétes*, Buffon declared that of all the parts of his *Histoire naturelle*, this one was in particular need of revision. The dispatching of expeditions and the writing of reports by specialists had not only made more information available, he suggested, but had also made it more reliable, thus considerably reducing the old danger of being taken in by the inventions scattered through most travel reports.[64] In 1775 Johann Christian Daniel Schreber's natural history of mammals was published. Its treatment of human varieties [menschliche Spielarten][65] was modelled on Buffon. The text is accompanied by an apparatus of footnotes which, for every key notion—often several in a sentence—refer to the relevant passages in the travel literature, which had in the meantime grown considerably. Schreber's main source, in particular for the peoples of the Pacific, is the German translation of Prévost's compilation of travel writing mentioned in the introduction to this essay, *Allgemeine Historie der Reisen zu Wasser und zu Lande*,[66] which he refers to up to five times per page. All his descriptions of the quality of skin and hair, of physiques and physiognomies have been taken from travel reports:

> Outside Africa, in the Southern Lands,[m)] there are black peoples who do not differ from Negroes with respect to the colour of their skin, but at least some of whom have longer hair than Negroes; some have hair that is as long as that of white people. These include the inhabitants of New Guinea, New Zealand and New Holland[n)].[67]

The relevant footnotes comment:

> [m)] The oldest inhabitants of the islands of Manila are of this colour, and some have short curly hair, while others have longer hair. A.H.d.R. [Schwabe, Allgemeine Historie der Reisen, B.D.], vol. XI, p. 394, 407, 412. On New Guinea see vol. XVIII, p. 552, 570.

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[63] *Les six voyages de Jean-Baptiste Tavernier… qu'il a fait en Turquie, en Perse, et aux Indes* (Amsterdam 1678). Cf. ibid., (Paris 1680–1682 edn.), I: 300.

[64] Cf. Buffon 1774–1789 (note 59), IV (1777): 454f.

[65] Johann Christian Daniel von Schreber, *Die Säugethiere in Abbildungen nach der Natur mit Beschreibungen* (Erlangen 1775–1855), 19 vols., I: 7.

[66] Schwabe 1747–1774 (note 11).

[67] Schreber 1775–1855 (note 65), I (1775): 9f.

> [n)] A.H.d.R., vol. XI., p. 472; vol. XII., p. 226, 242; vol. XVIII., p. 490. For a picture of a black person of this sort, who also resembles a Negro in respect of his curly hair, see de Brun *voyage aux indes orient.* [Corneille de Bruyn: Voyages par la Moscovie en Perse et aux Indes Orientales, Amsterdam 1718, B.D.] vol. 1, p. 338.[68]

Humans whose appearance lay outside the (increasingly narrow) canon of what was regarded as plausible needed to be authenticated by a maximum of references to travel writing. Examples are the already discussed Patagonian giants and the pale-skinned "white Negroes". The observation that even among dark-skinned peoples, white-skinned individuals who are highly sensitive to light are occasionally found, long had a special status in the natural history of man because it could be used in the continuing controversy over the question of whether man's original skin colour was black or white.

Schreber's description of the human phenotype also discusses this phenomenon, whose precarious status is supported and authenticated by a densely woven web of cited eyewitness accounts. The following passage demonstrates the procedure, followed by the critically commented compilation of travel reports on which the natural history of man was based until comparative anatomy[69] established itself as the sole method:

> Black children produced by white parents are not yet reliably confirmed; . . . More commonly, red, brown or black[s)] parents in America, the East Indies, Africa, Madagascar, and the Southern Lands produce white children, but of a particular type. In Africa they are called Albinos, Dondos, white Negroes . . . Their whiteness differs from that of true white people, and is milky white or corpselike[t)], and the skin wrinkled[u)]. The eyes are grey, yellow, or reddish[v)]. . . . The hair on the head and above the eyes, the eylashes, the beard and the fine body hair is also milky white; but Dondos with yellow[y)] or red[z)] hair have also been seen.[70]

The sources of information from which this is drawn are documented in parallel. Selecting them, commenting on them and supplementing them is what made up the author's achievement. The argument—a structure made up of the observations of others—is presented not in the main text, but in the footnotes:

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[68] Ibid. Here and in what follows, I have added references to the titles mentioned in square brackets.

[69] On this point, see Dietz and Nutz 2005 (note 60), 67ff.

[70] Schreber 1775–1855 (note 65), I (1775): 11–13.

s) A.H.d.R., vol. III., p. 552; vol. IV, p. 666; vol. XVIII, p. 97.... See also the *Histoire de l'Acad. Royale des sciences de Paris 1734, p. 15 and 1744, p. 12*.
v) The white Negro child from Surinam that is mentioned in the *Hist. de l'Acad. de Paris 1734* had fiery red irises, marbled with a few streaks of white shading into blue. Another one described in 1744 was the same ... See Herr von Haller's *elem. physiol.* [Albrecht von Haller: Elementa physiologiae corporis humani, 8 vols., Lausanne 1757–1766, B.D.] tom V, p. 365, 370, 383.
y) A.H.d.R., vol. XVIII, p. 97.
z) A.H.d.R., vol. IV, p. 666....[71]

Less plausible information is brought together in a concluding footnote. Authenticated only by less reputable travel writers, it lies on the periphery, so to speak, of the corpus of sources.

In a number of cases, the information profile of printed publications can be traced in the author's method of working. This may be documented in hand-written notes and collections of excerpts which testify to wide reading and a systematic analysis of travel reports, and in letters containing requests for the most diverse travel literature to be sent or acquired on the author's behalf. The preservation of sources relating to an individual's method of working is necessarily random and often full of gaps. Nonetheless, it is revealing in respect of the significance attached to the reading of *itineraria* and topographies, the extracting of the observations of others, and the compiling of what was useful for the author's own purposes and necessary for the writing of natural history.

The papers left by the French mineralogist Jacques-Etienne Guettard (1715–1786), for example, contain three notebooks of extracts from the travel literature set out in the form of a dictionary: the first column contains the name of the substance or organism; the middle column contains the excerpted information; and the last column contains a precise reference for its location. The first notebook contains mineralogical, zoological and botanical notes on two seventeenth-century travel reports, Adam Olearius's *Oriental journey* (first published in 1647), which has already been mentioned a number of times, and one by Johann Albrecht von Mandelslo:[72]

Chalk and Sand:	Mountains of chalk and others of sandstone in Tartary, near Kasan, and on the Volga, 287.
Shells, Fossils:	very abundant in the hills of Dagestan, vol. 2, 50.[73]

[71] Ibid.
[72] *Des HochEdelgebornen Johann Albrechts von Mandelslo Morgenländische Reyse-Beschreibung* (Hamburg 1658).
[73] Manuscrits provenant de Jacques-Etienne Guettard. BCMHN, MS 175.

The second and third notebooks are filled, journey by journey, with extracts from Prévost's compilation, *Histoire générale des voyages*, discussed above. The papers left by Gabriel L.C.A. Bexon, known as Abbé Bexon, who worked closely with Buffon in the *Jardin des Plantes*, similarly document the intensive use made of this universal compendium. In his collection of materials on the natural history of shells Bexon had, among other things, drawn up a list noting each page in every individual volume of the *Histoire générale* that contained information on pearls.[74] The papers left by Georges Cuvier also contain, among other things, a list of books he had made over to his assistant, Achille Valenciennes, so that he could finish his monumental, twenty-two-volume natural history of fishes.[75] In addition to ichthyological literature and a number of catalogues of relevant collections, the list in essence contains topographies and titles of travel literature, both older classics and the most recent accounts.[76]

But travel reports and topographies not only brought new information to Europe; they also had a fixed place in the luggage of scientific travellers. Observations made by others and written down in Europe were transported back to where they came from—whether as an aid to orientation or to verify or discredit them—in order to guide the gaze of the subsequent observer. Thus the scientists accompanying Jean-François de La Pérouse on his planned circumnavigation of the world (1785–c. 1788) were equipped not only with measuring instruments, packing material and apparatus for preparing specimens, but also with the following books: "un voyage de Dessausures", "un Piso et Margraaf *Historia india*",[77] *Découvertes des Européens dans les différentes parties du monde*, 12 vol. in 12°, *Voyage à la Martinique de Gunvallon, Voyage en Californie, Découvertes dans les voyages de mer du nord*.[78] The list ends, surprisingly, with Rousseau's speculative and provocative *Discours sur l'inégalité parmi les hommes*, a controversial text which draws up the scenario of a happy state of nature lost through the progress of civilization.

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[74] See BCMHN, MS 863.

[75] État général et détaillé des ouvrages provenant de la bibliothèque de M.G. Cuvier, légués par lui à M. Valenciennes et restés entre ses mains, pour la continuation de ses travaux et appartenant à la bibliothèque du Muséum d'Histoire Naturelle. BCMHN, MS 1963.

[76] Ibid., 2r–v.

[77] In one volume: *Guilelmi Pisonis de indiae utriusque re naturali et medica*; Georgii Margravii de Liepstadt, *Tractatus topographicus & meteorologicus Brasiliae* (Amsterdam 1658).

[78] Cf. État des instruments, livres et autres objets approvisionnés pour Mrs. les Savans et artistes qui sont de l'expedition de M. de La Perouse. BCMHN, MS 1928.

DISTANCES CELESTIAL AND TERRESTRIAL. MAXIMILIAN HELL'S ARCTIC EXPEDITION OF 1768–1769: CONTEXTS AND RESPONSES

László Kontler*

The protagonist of this paper was one of the few scholars originating from the old Kingdom of Hungary who made a mark internationally in the field of natural sciences before the nineteenth century. His achievements, especially the ones directly arising from the expedition revisited below, have continued to be recognized by generations of posterior scientists as significantly contributing to the progress of knowledge. Small wonder then that the existing literature on Maximilian Hell belongs to one of two kinds, and in a few cases their combinations. On the one hand, in patriotic-laudatory treatments of his work (sometimes verging on the hagiographic) he has been hailed as a figure somewhat heroically defying a perceived marginality in order to advance mainstream Western science. On the other hand, his contributions have been assessed by the standards of a predominantly internalist history of science, on account of the accuracy of his measurements, or the peculiarities of instrumentation.[1]

This study takes a different perspective on the subject, and relies on especially two relatively recent developments in the history of science.

* I am grateful for comments to Catherine Jami, Antonella Romano and Zsuzsanna Török, and the participants of the summer university session "Space, Science and Claims to European Domination. The Dynamics of Knowledge from the Renaissance through the Enlightenment" (Central European University, Budapest, 20–31 July 2009).

[1] A two-volume work devoted to "the memory of Maximilian Hell", a host of relatively short Hungarian-language articles, and references in survey histories of Hungarian astronomy belong to the former, and some pieces of international (mainly Norwegian) scholarship to the latter category. See Ferenc Pinzger S.J., *Hell Miksa emlékezete* (Budapest 1920–1927), 2 vols.; Per Pippin Aspaas and Truls Lynne Hansen, *Maximilian Hell's Geomagnetic Observations in Norway 1769* (Tromsø 2005); Per Pippin Aspaas and Truls Lynne Hansen, 'Geomagnetism by the North Pole, anno 1769: The Magnetic Observations of Maximilian Hell during His Venus Transit Expedition', *Centaurus* 49 (2007), 138–164. The expedition also figures as an episode in Harry Woolf's standard *The Transits of Venus: A Study of Eighteenth-Century Science* (Princeton 1959), as well as several more recent surveys, in no small measure occasioned by the 2004 transit. Eli Maor, *Venus in Transit* (Princeton 2004); William Sheehan and John Westfall, *The Transits of Venus* (Amherst 2004); Christophe Marlot, *Les Passages de Vénus: Histoire et observation d'un phénoméne astronomique* (Paris 2004).

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First, it owes a great deal to the challenges addressed to the "diffusionist" model of the spread of "Western" science and its rise to "universality", mainly articulated in terms of "science and empire" studies and post-colonial studies,[2] but also relevant to the issue of the symbolic regional hierarchies arising from the differentials in the production of scientific knowledge in intra-European contexts. "Policentricity" has been one of the central concepts of these transformations. We have been advised to take notice of the complex processes of negotiation and accommodation, and the mutual (though asymmetric) participation of agents from both sides of the divide in the American, South- and East-Asian "contact zones" between European and other systems and corpuses of knowledge. As a result, the relationship between such "knowledges" is increasingly being defined not in terms of deficit but difference: it has been suggested that the failure or difficulty of a system of knowledge to take hold in a certain locality is best explained by reference not to the backwardness or deficiency in the target culture, but by uncovering the local intellectual-social interests that stand to lose or gain from it.[3] In this sense, Europe's internal peripheries, in particular Central, Eastern and Southeastern Europe, are just as much in need of overcoming their own "Basalla model" of diffusion[4] and (truncated) reception, and of turning around the traditional question guiding histories of cultural and intellectual encounter between them and the "more happy" regions of the old continent. Instead of inquiring into the obstacles of the local dissemination and appropriation of cultural goods, assembled from local sources but certified as "global" knowledge in the metropolitan centres (and finding those obstacles in

[2] Important earlier pieces of the now vast literature include Roy MacLeod and Philip F. Rehbock (eds.), *Nature in Its Greatest Extent: Western Science in the Pacific* (Honolulu 1988); John Mackenzie (ed.), *Imperialism and the Natural World* (Manchester 1990); Patrick Petitjean, Catherine Jami and Anne-Marie Moulin (eds.), *Science and Empires: Historical Studies about Scientific Development and European Expansion* (Dordrecht 1992); David Philip Miller and Peter Hanns Reill (eds.), *Visions of Empire. Voyages, Botany, and Representations of Nature* (Cambridge 1996); Benedikt Stuchtey (ed.), *Science Across the European Empires, 1800–1950* (Oxford 2005).

[3] See e.g. David Wade Chambers and Richard Gillespie, 'Locality in the History of Science: Colonial Science, Technoscience, and Indigeneous Knowledge', in Roy MacLeod (ed.), *Nature and Empire: Science and the Colonial Enterprise* (Chicago 2000), 221–240; Kapil Raj, *Relocating Modern Science. Circulation and the Construction of Scientific Knowledge in South Asia and Europe* (Delhi 2006); Harold Cook, *Matters of Exchange. Commerce, Medicine, and Science in the Dutch Golden Age* (New Haven 2007); James Delbourgo and Nicholas Dew (eds.), *Science and Empire in the Atlantic World* (London 2008); Neil Safier, *Measuring the New World. Enlightenment Science and South America* (Chicago 2008).

[4] As developed in George Basalla, 'The Spread of Western Science', *Science* 165 (1967), 156 and 611–622.

socio-economic backwardness and an inadequate intellectual environment), it looks more instructive to explore the local conditions of selecting from such "global" knowledge—a perspective in which the notion of historical agency assumes new significance.

Agency is indeed also crucial to the second development by which the current investigation is informed: the now widespread concern with the history of science not as the evolution of bodies of specialized disciplinary knowledge, but as a set of social and cultural practices thoroughly embedded in contexts that lay very substantially outside the domain of science itself.[5] The recognition that the belongings, loyalties and agendas of the practitioners of science depend on such contexts, and that their achievements have implications way beyond the augmentation of scientific knowledge, leads to a better and richer understanding of what actually *happens* in the production of knowledge as a process. In particular, the intertwining of "big science" with "big business" and "big government" has been posited and explored by historians of science with great vigour. Yet, our grasp on the complexity of such intertwinings, and especially the contingencies involved in the coalescence of apparently unrelated contexts in the production of knowledge, is still capable of further refinement. In this paper I hope to show that the study of the Hell expedition of 1768–1769, especially in regard of the complexity of its endeavours and the divergence of the responses to it, is a suitable means of providing such refinements by telling a story that highlights the contingencies which shaped the nature of knowledge production in the Enlightenment. The expedition will be examined as an instance of scientific self-fashioning by *savant*s from the geographical margins of learned Europe in a highly variegated context which consisted of the forging of identities on personal-professional, national as well as global scales, of broader processes of European expansion and exploration both in distant territories and in internal borderlands, of a peculiar type of transnational collaboration in eighteenth-century field science, of trans-confessional exchange, of stately self-assertion on the part of a Scandinavian kingdom, and of political conflict in a Central European composite monarchy.[6]

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[5] Select studies include Bruno Latour, *Science in Action: How to Follow Scientists and Engineers Through Society* (Cambridge 1987); Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago 1994); William Clark, Jan Golinski and Simon Schaffer (eds.), *The Sciences in Enlightened Europe* (Chicago and London 1999).

[6] Neither the space available here, nor the early stage of this research allows me to consider the equally important questions of the material practices implied by fieldwork, or the "native voices" which may be detected in the record of the expedition. Such aspects

Contexts: Global Scientific Travel and Local Political Conflict

Most immediately, the expedition was occasioned by an invitation to Hell by Christian VII, King of Denmark-Norway, to lead an expedition beyond the Arctic Circle to observe the transit of Venus across the solar disc, expected to occur in the summer of 1769. The passages of Venus across the Sun's disc in 1761 and 1769 had been forecasted as pivotal events in the eighteenth-century history of astronomy by Edmond Halley,[7] who suggested that through observations of the transit from widely separated sites it would be possible to record small variations, and in this way the distance between the Sun and the Earth could be calculated. The stake of these observations would be, then, the very dimensions of the solar system and the place of the Earth in it, which, despite the improvement in the methods of establishing the movement of the planets thanks to the Newtonian theory of gravitation and mechanics, was still a matter of considerable uncertainty. Hell was accompanied by János Sajnovics, an astronomer and a Jesuit like himself, but specifically commissioned to inquire into the Sámi (Lappian) language and thus to test on empirical material the alleged kinship between it and Hungarian—a matter of assigning "place" on a different scale, this time for human populations on the symbolic map of mankind.

Looking at the contexts I am interested in, the widest, indeed truly global one among them is certainly the "maritime cold war" emerging on the distant waters of the Pacific Ocean, subsequent to the conclusion of the first of "world wars" (otherwise known as the Seven Years' War) by the Treaty of Paris. Captain Cook's first voyage of exploration, also commissioned to observe the transit and already under serious planning when the invitation was delivered to Hell in the autumn of 1767, was only the most salient among several facets of this geopolitical enterprise whose goal was

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of scientific travel are now rightly becoming a preoccupation for scholars, see e.g. Safier 2008 (note 3).

[7] Edmond Halley, 'Methodus singularis quâ Solis Parallaxis sive distantia à Terra, ope Veneris intra Solem conspiciendæ, tuto determinari poterit', *Philosophical Transactions [of the Royal Society of London], Giving Some Account of the Present Undertakings, Studies, and Labours of the Ingenious, in Many Considerable Parts of the World* 29 (1714/16), 454–464 (no. 348). Halley's account was based on a paper read before the Royal Society already in 1691, itself based on ideas conceived during his observation of the transit of Mercury at the island of St. Helena in 1677.

to ensure naval dominance through the establishment of naval bases and supply stations.[8]

Closer home, the contexts also include the recent return to Copenhagen of Carsten Niebuhr as the sole survivor from an expedition of a group of distinguished German and Danish scholars in Arabia Felix (more or less, modern-day Yemen). Prompted by the famous Göttingen biblical scholar Johann David Michaelis, built around cosmopolitan figures and taking place against a background of international scientific communication, but enjoying the enthusiastic sponsorship of Christian VII's predecessor Frederick V, this undertaking aimed to chart the natural history, geography and history of the territory by collecting documents and specimens for the greater enlightenment of the world and the greater glory of the Danish Crown.[9]

Shortly after Niebuhr's return and almost simultaneously with Cook's and Hell's embarking on their respective journeys, still in 1768, Johann Eberhard Fischer, another German scholar at that time related to Göttingen, but in his earlier career recruited to Russia as the secretary of the second Kamchatka (or "Bering") expedition between 1733–1743 (himself involved in the fieldwork from 1740), completed and published his two-volume *Sibirische Geschichte von der Entdeckung Sibiriens bis auf die Eroberung dieses Landes durch die Russische Waffen* in Saint Petersburg. Fischer's book reiterated and further contextualized the claim already made in the same author's *De origine Ungrorum* (1756, published 1770) that the Hungarians are a Finno-Ugrian people, and soon became a reference work in German academic circles.[10]

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[8] Scientific travel was promoted by its practitioners with reference to the prestige it earned for Britain as an aristocratic state, the commercial gains brought for her as the world's leading trading nation, as well as the strategic advantage it secured for her as a colonial power. For an exploration of these themes, see John Gascoigne, *Science in the Service of Empire. Joseph Banks, the British State and the Uses of Science in the Age of Revolution* (Cambridge 1995), especially chapters 3, 5 and 7.

[9] On the trials and accomplishments of the expedition, see Thorkild Hansen, *Arabia Felix: The Danish Expedition of 1761–1767* (London 1964). See also the interesting comparative analysis in Han F. Vermeulen, 'Anthropology in Colonial Contexts: The Second Kamchatka Expedition (1733–1743) and the Danish-German Arabia Expedition (1761–1767)', in Jan van Bremen and Akitoshi Shimizu (eds.), *Anthropology and Colonialism in Asia and Oceania* (Richmond 1999), 13–39.

[10] Fischer's role is usually understood as subsidiary to the better known German scholars recruited for the expedition, the naturalist Johann Georg Gmelin and especially the historian Gerhard Friedrich Müller. He is also recognized as having written at the request of August Ludwig Schlözer the *Vocabularium Sibiricum* (1747), deposited in manuscript as

To such practical and intellectual contexts of the Hell expedition, we may add a thoroughly public-political one: the estrangement between the Viennese court and the Hungarian nobility in the aftermath of the meeting of the Hungarian diet in 1764–1765. At this assembly the Hungarian estates, jealous of their privileges, but also infuriated by a series of publications apparently commissioned by the government and directly challenging those privileges, refused the ruler's demand for increased war tax, a general overhaul of the entire system of taxation, and military reform at their own expense. In response, Maria Theresa's government decided to implement its plan of abandoning the dialogue with the estates, and neglecting the diet in its future pursuit of the much needed reforms.[11]

Maximilian Hell: From Upper Hungary via Vienna to the Arctic

Before exploring the expedition and its various astronomical and linguistic-ethnographic results against each of these backgrounds, it will be helpful to survey Hell's rise and career as a scholar of international distinction prior to the invitation received from the Danish king.

Maximilian Hell (born as Höll, 1720–1792) was the scion of a family of mining experts of German descent, from Selmecbánya (Slo. Banská Stiavnica, Ger. Schemnitz), a small but prosperous mining town in Northern Hungary (now Slovakia). Having graduated from the local gymnasium, he joined the Society of Jesus in 1738. He spent his novice years in Trencsén (Slo. Trenčin), and then in 1741 he moved on to study philosophy, natural sciences and mathematics (a few years later also theology) in Vienna. He began publishing on mathematical and astronomical subjects in 1744. He was ordained in 1751. While being, from 1745, a gymnasium teacher in various towns first in his home region and then at Kolozsvár (Rom. Cluj, Ger. Klausenburg) in Transylvania, he participated in the planning and directed the construction and equipment of several observatories in the country (Nagyszombat [Slo. Trnava, Ger. Tyrnau], Kolozsvár, Eger and

a gift in the Historical Institute in Göttingen, to be used extensively by later scholars there. The literature on Fischer is meagre, but see passing references in Vermeulen 1999 (note 9), 22–25; Yuri Slezkine, 'Naturalists versus Nations: 18th-Century Russian Scholars Confront Ethnic Diversity', *Representations* 47 (1994), 170–195: 186–187. For the Kamchatka expeditions in the context of eighteenth-century Russian voyages of discovery, see Erich Donnert, *Russia in the Age of Enlightenment* (original German edn. 1983, Leipzig 1986), 95–114.

[11] Robert J.W. Evans, 'Maria Theresa and Hungary', in Hamish M. Scott (ed.), *Enlightened Absolutism. Reform and Reformers in Eighteenth-Century Europe* (London 1990), 189–207.

Buda). In 1755, already a scholar of some reputation, Hell moved back to Vienna, this time appointed by Maria Theresa as imperial and royal astronomer. The diverse activities which he performed in his new position with a keen sense of calling included the creation, maintenance and improvement of the equipment of a new university observatory (besides the already existing Jesuit one); lecturing at the university; editing (actually, for the most part, writing) the unique periodical *Ephemerides Astronomicae ad Meridianum Vindobonensem* and publishing in it findings that were extensively utilized by the imperial authorities for the purposes of geodetic surveys and mapping. These aspects of his work helped him develop contacts with the foremost astronomers of the age, and earned him international recognition, especially on account of the accuracy of his astronomical observations. The 1768–1769 expedition was thus the crowning achievement of a carefully built career. But the suppression of the Jesuit order in 1773 deprived Hell of a considerable amount of leverage in terms of financial support and intellectual ambience. As a secular priest and a professor he still continued to exert a many-sided scientific activity which embraced, besides astronomy, also physics, geography, history and ethnography. The *Ephemerides* also continued to his death in 1792. Apart from the Arctic expedition, today he is mainly remembered on account of his contributions to the study of electricity, astrometrics and magnetism, and his method for the measuring of geographic longitude.

Already during the 1761 transit of Venus, Hell and his staff (supplemented by a few prestigious guests) made observations, and gave an account in the *Transitus Veneris ante discum Solis anni 1761*. For our present purposes, however, more interesting is another piece by Hell, combining the inferences from his 1761 observations with those he had made earlier, in an attempt to contribute to the much debated issue whether Venus had a satellite.[12] The argument of the little treatise *De satellite Veneris* (Vienna 1765) is based on a simple statement, supported by minute analysis, about the properties of telescopes of various systems: each of them produce reflections and thus "pretty little optical errors" or "illusions", so what seems a satellite may not exist at all.[13] This argument is not, in the first place, mounted in order to *refute* the existence of the satellite but to insist on the *sine qua non* of all empirical science: that

[12] On this subject, see Helge Kragh, *The Moon that Wasn't* (Basel 2008), chapter 4.2 (for Hell's contribution).

[13] Maximilian Hell, *De satellite Veneris* (Vienna 1765), 13.

Fig. 1. Johann Elias Haid: The astronomer Maximilian Hell, mezzotint, 1771. Staats- und Stadtbibliothek Augsburg.

experiments must be repeated with the same instruments among exactly the same conditions. What is perhaps even more noteworthy is the manner of address and tone of the treatise. An initial name-dropping is undoubtedly intended to locate the author in the august company of colleagues such as the "famous" (Pehr Wilhelm Wargentin, secretary of the Royal Swedish Academy of Sciences and the organizer of the Swedish Venus expeditions of 1761 and 1769); the French "comet hunter" (Charles Messier) and the "brilliant" (the geophysicist Jean-Jacques Dortous de Mairan), some of them identified as his "intimate friends" (Nicolas-Louis de la Caille) or simply as "our father" (Joseph Louis La Grange—actually sixteen years Hell's junior, but already recognized as one of the greatest mathematicians of the age), with all of whom he maintains a mutually inspiring correspondence and who have proved themselves to be a captive audience for his corrections of their research results.[14] This might well create an aura of presumptuousness, were it not for the tone of elegant, subtle irony in Hell's addressing the celebrities who are his putative interlocutors: a tone not of upstart self-exertion, but one of dignified self-confidence on the part of a scholar who, while arising from somewhat obscure origins, is firmly aware of his status on the map of contemporary learning.

The invitation from the King of Denmark-Norway to lead the most prestigious of three Copenhagen-sponsored transit expeditions in 1769, delivered to Hell by the Danish Ambassador Count Bachow on 5 September 1767, is further evidence that such manners did not arise from mere self-conceit. From Hell's point of view, the invitation, though unexpected, was not only "worthy of [his] soul born for the obtaining of merit in the realm of the sciences",[15] but indeed a golden opportunity. As he confessed in the address to "the astronomers" at the outset of his *Observatio transitus Veneris ante discum Solis die 3 junii anno 1769* (Copenhagen 1770; also printed in the Lepizig-based *Nova Acta Eruditorum* in 1770, and in the *Ephemerides* in 1771), in 1767 he would never have contemplated leaving his post in Vienna for the sake of the observation, and would have been content to rely on the results of others in doing his own calculations.[16] He had good reason for this resignation. Hell was well aware that in Vienna the passage, taking place at European longitudes in the middle of the night,

[14] Ibid., 6 and 13.
[15] Maximilian Hell, *Observatio transitus Veneris ante discum Solis die 3 junii anno 1769* . . . (Copenhagen 1770), 1.
[16] Ibid.

was hardly visible at all. But he was a Jesuit: one of the roughly 900 brethren still active in the Kingdom of Hungary a decade after the demise of the order started with its banishment from Portugal, and just a few years before the "Dominus ac Redemptor noster" brief issued by Clemens XIV in 1773 announced its suppression. While even at this late moment, thanks to their traditions of learning, discipline, sense of purpose and organization, their presence on the map of knowledge and power in the Habsburg Monarchy was visible well beyond their sheer number, it must have been clear to Hell that as a member of the order his chances of travelling to the realm of the Midnight Sun were as meagre as seeing anything of the transit in the Austrian capital: the northern Protestant kingdoms imposed severe restrictions on Catholics, and Jesuits were normally not allowed to enter at all. The royal invitation, of course, all of a sudden cancelled such restrictions for Hell, who did not need to think twice: already on 7 September 1767, Bachow reported that imperial and royal assent pending, Hell was ready to prepare for the journey to Vardø.[17]

The amount of diplomatic correspondence around the plans and later the journey itself demonstrates the extent to which it was regarded as an affair of state in Copenhagen as well as Vienna. Maria Theresa, on her side, seems to have clearly realized that Hell's release would boost the reputation of her court and the university. There was, of course, another party to the deal. While the French and the British played a dominant role in the Venus activities throughout the 1760s, especially in regard of the geographic peculiarities of the undertaking it is no wonder that the Scandinavian kingdoms—Sweden, beyond its zenith of political and military might, and Denmark-Norway, never a first rank European power—were ambitious to contribute and to reap laurels. It has been argued that "Linnean empire"—the symbolic ordering of the world through the elaborate taxonomical system developed by the famous botanist Carl Linné (Linnaeus), capable of embracing the whole of creation, and the attempt of the practical application of this system to the domestication of crops and species within the confined boundaries of Sweden—was an endeavour to create a "local modernity" and an enlightened counterpart to the

[17] For the details of the journey, I have relied on the record in Sajnovics' journal of the expedition, published in German translation in Carl Ludwig Littrow, *P. Hell's Reise nach Wardoe bei Lappland und seine Beobachtung des Venus Durchgangs im Jahre 1769* (Wien 1835), 87–166. See also Aspaas and Hansen 2005 (note 1), 7ff.

erstwhile greatness of Gustavus Adolphus and Charles XII.[18] In a similar fashion, the explorations sponsored by the Danish Crown were intended to raise a stock of cultural capital that would place the country on the map of learning and thus increase national reputation.[19] In a different perspective, Hell's expedition was a reverse of the cases of "scientific hitchhiking" which took dozens of eighteenth-century Scandinavian scholars under British, Dutch, Russian, Spanish and other sails to the waters of the Pacific and the forests of Amazonia—but the agenda and the yields were not different.

The team that traversed Arabia Felix satisfied such ambitions to a remarkable extent. This was an enterprise in which an aura of internationalism and stately self-promotion quite smoothly reinforced each other. The expedition, mobilizing Danish scholars as well as Swedes born in Finland and educated in Göttingen, and Germans who studied in Copenhagen, was to receive a research agenda—questions—from learned institutions, such as the Académie des Inscriptions et des belles Lettres of Paris, across Europe. But the answers to these questions, together with the objectifiable results—sketches, drawings, charts, manuscripts, natural specimens—and thus the sum of the knowledge culled by the expedition was to be sent to and deposited in Copenhagen (the royal library in particular). Altogether, these are unmistakably the building blocks of a coherent project organized around the recognition that science possesses the capacity of conferring status on the international scene.[20] For a Scandinavian kingdom, the uncharted and unwelcoming territories of the North offered unbounded, quasi-domestic opportunities to cultivate aspirations arising from this recognition.

The Venus observation attempts of 1761 in Trondheim and Copenhagen were a failure to the extent that they even got ridiculed.[21] (This was not without ground: while in Trondheim the weather was mainly to blame, in Copenhagen the observers were simply unable to keep correct track of the

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[18] Lisbet Koerner, 'Purposes of Linnean Travel: A Preliminary Research Report', in Miller and Reill 1996 (note 2), 117–152; id., 'Linnaeus' Floral Transplants', *Representations* 47 (1994), 144–169; and more comprehensively id., *Linnaeus: Nature and Nation* (Cambridge and London 1999).

[19] Sverker Sörlin, 'Ordering the World for Europe: Science as Intelligence and Information as Seen from the Northern Periphery', in Roy MacLeod (ed.), *Nature and Empire: Science and the Colonial Enterprise* (Chicago 2000), 65–67.

[20] Ibid.

[21] Claus Thykier, Kjeld Gyldenkerne and Per Barner Darnell, *Dansk Astronomi Gennem Firehunderde År* [Four-Hundred Years of Danish Astronomy] (Copenhagen 1990), ii. 251–252, cited in Aspaas and Hansen 2005 (note 1), 5.

time. In fact, two out of the three Danish expeditions launched in 1769, the exception being that of Hell, also became thwarted by bad weather.) It was decided that in 1769 no mistake was to be made: better locations were to be chosen and real experts recruited, even if the price was setting aside confessional scruples.[22] Hell having accepted the invitation, decided to take along his assistant at the observatory of Vienna, another Jesuit, János Sajnovics (as well as a servant and a dog). But having had an audience with Christian VII at Travental in Holstein and subsequently reached Trondheim by the end of July 1768, they were also joined there by Jens Finne Borchgrevink, a young disciple of Linnaeus. Perhaps more interestingly, Borchgrevink was also a favourite of Bishop Johann Ernst Gunnarus of Nidaros (Northern Norway) and, from 1771 onwards, a Lutheran priest himself. His role in the expedition, which thus became not only international but also inter-confessional, was to be that of a scientific assistant as well as translator and "local guide".

Astronomical Observations at Vardø and Elsewhere: One for All, All for One?

At the same time, both in regard of its patronage and its composition, the expedition coordinated by Hell was a counterpart of several dozens of similar ones taking place simultaneously all around the northern hemisphere, and a microcosmic version of what they, taken together, constituted: a gigantic international enterprise of eighteenth-century field science. This project of national-stately self-assertion through royal-governmental patronage to an expedition likely to earn prestige, inevitably had to be embedded in a thoroughly cosmopolitan context, and from the perspective of the participating individual scholars and teams the emulative drive had to be tempered by a sense of collegiality, while the lofty ideal of harmonious collaboration for the shared purpose of the advancement of knowledge was qualified by several realities.[23] In many ways, the

[22] The exact reasons for the selection of Hell, rather than any other of the numerous renowned astronomers of the age, by the Danish government, are central to our understanding of his scientific credentials as well as the contexts and motivations of decision-making in matters of patronage. The issue needs careful further consideration.

[23] We have been reminded of the tension between such ideals and realities in the republic of letters (and of science), among others, by Lorraine Daston, 'The Ideal and Reality of the Republic of Letters in the Enlightenment', *Science in Context* 4 (1991), 367–386; Adrian Johns, 'The Ideal of Scientific Collaboration: The "Man of Science" and the Diffu-

complexities of knowledge production were not unlike those involved in any other set of contemporary communicative practices that could be modeled after the then relatively newly discovered experience of the market, which depended on the maximization of one's profit through satisfying the needs of one's partners. Responding to Rousseau, who claimed that man's natural state was independence arising from one's ability fully to provide for the necessities of life, it was exactly in the 1760s and 1770s that Adam Smith worked out his highly influential anthropology of commercial *and* sociable man.

> In almost every other race of animals each individual, when it is grown to maturity, is intirely [sic] independent, and in its natural state has no occasion for the assistance of no other living creature. But man has almost constant occasion for the help of his brethren, and it is in vain for him to expect it from their benevolence only. He will be more likely to prevail if he can interest their self-love in his favour, and shew them that it is for their own advantage to do for him what he requires from them.[24]

Whether at the market place, the stock exchange, the coffee-house, the assembly room or the academy, men and women were in the first place seeking their own good. But what they coveted—a fair price, a good conversation, the applause and admiration of fine society, or recognition for scientific achievement—was understood as a matter of giving as well as taking. For in the course of such exchanges, each of the parties felt that their own interests were best served if they placed themselves in the position of the others, applying the faculty of empathy to perceive *their* interest in the transaction. Such encounters, whose sum total is the everyday reality of commercial modernity, are so many successive steps in refining our sense and willingness to apply our ability to pass critical judgement on the "characters and conduct of other people" to ourselves, and thus in becoming sociable and moral agents. "We suppose ourselves the spectators of our own behaviour, and endeavour to imagine what effect it would, in this light, produce upon us. This is the only looking-glass by which we can, in some measure, with the eyes of other people, scrutinize our own conduct."[25]

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sion of Knowledge', in Hans Bots and Françoise Waquet (eds.), *Commercium Litterarium. Forms of Communication in the Republic of Letters* (Amsterdam 1994), 3–22.

[24] Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations*, ed. by R.H. Campbell and A.S. Skinner (Indianapolis 1981), 2 vols., I: 26.

[25] Adam Smith, *The Theory of Moral Sentiments*, ed. by D.D. Raphael and A.L. Macfie (Indianapolis 1982), 112.

Kant was to call *ungesellige Geselligkeit*, unsocial sociability, the paradoxical disposition of fellow feeling arising precisely out of a reasonable and enlightened self-regard.[26] Natural philosophy or the "new science" was no exception. On the contrary, it could be easily understood as a social realm in which personal vanity and ambition almost imperceptibly collapsed into and drew mutual reinforcement from one another with an ethics of service to mankind through the production of useful knowledge. Even among the numerous instances on which this could be demonstrated, the Venus transit represents a liminal case. This arose from the nature of the task and the stakes, already hinted in the introduction: as the ultimate goal, the establishment of the distance between the Sun and the Earth, could be achieved only by the collation of data from widely scattered sites in which the shifts of the crossing were recorded, success depended on international cooperation and the sharing of research results on an unprecedented scale. Already in 1761, about 124 observers were involved at 65 different places. The results being unsatisfactory, the number of observational posts increased to 76 by 1769.[27] The most famous expedition assigned, among many other tasks, to observe the 1769 transit of Venus, was undoubtedly that of James Cook, the location in this case being the island of Tahiti. Cook's 1768–1771 circumnavigation, of which the transit observation was to be a principal episode, was also paradigmatic in the sense that it perhaps most colourfully represented the hardly precedented scale of cross-disciplinary effort manifest in the ventures: astronomical-geographical-cartographic measurement was to be accompanied with the collection of botanical, zoological and mineralogical specimens as well as cultural, historical and anthropological inquiry into the customs and manners, institutional and religious practices etc. of the natives inhabiting the lands hitherto unexplored by Europeans.[28] But Cook's venture was only one, albeit the most complex and for obvious reasons the best

[26] For important reconstructions of this tradition of thought, see Richard Tuck, *Philosophy and Government, 1572–1651* (Cambridge 1993); Knud Haakonssen, *Natural Law and Moral Philosophy. From Grotius to the Scottish Enlightenment* (Cambridge 1996).

[27] For a full list of the observation posts and the observers (as well as their instruments and sponsors) from both 1761 and 1769, see Woolf 1959 (note 1), 135–140 and 182–187.

[28] The complex cross-disciplinary effort of the voyage is well documented in the vast literature on Cook and the Pacific since the 1980s. On the strictly astronomical aspects, see Richard van der Riet Woolley, 'The Significance of the Transit of Venus', in Geoffrey M. Badger (ed.), *Captain Cook: Navigator and Scientist* (Canberra 1970), 118–135; Wayne Orchiston, 'From the South Seas to the Sun: The Astronomy of Cook's Voyages', in Margarette Lincoln (ed.), *Science and Exploration in the Pacific: European Voyages to the Southern Ocean in the Eighteenth Century* (Woodbridge 1998), 55–72.

known, among many, the others differing from it in scale rather than kind, whether they took place in the Pacific, in California, at the Hudson Bay in Canada, in Scandinavia or in the Kola Peninsula in North-West Russia.[29] The many dozens of Britons, Frenchmen, Russians and others were supposed to send the data they collected to the Académie royal des sciences in Paris, where the French astronomer Joseph Jérôme de Lalande was to synthesize the results.

At the same time, in an age increasingly marked by a competition of military and mercantile strategies on a global scale—processes known by shorthand terms like imperialism and colonialism—such incentives to collaboration and collegiality were not only checked by the individual emulation and jealousy of the participating scholars (one instance of which I shall briefly glance at). The nowadays often mentioned link between knowledge and power is poignantly illustrated by the shifting boundary between the notions of curiosity and interest,[30] both of them so central to the understanding of what the "new science" was about since Francis Bacon. The mastery over resources, territories and populations became understood and explained as a matter of cognitive appropriation: exploring, observing, measuring, understanding and classifying was seen as resulting, in a very profound and complex sense, in possessing. For a maritime and mercantile great power like Britain, astronomic observation, the calculation of the solar parallax and the resulting assessment of the distance between the Sun and the Earth, was also a matter of defining latitudes and longitudes, in other words, distances on the surface of the Earth, thus the time needed to reach one point from another, with greater precision—which in turn was crucial for securing supply lines in an increasingly intense race for the control and management of global resources. Cook's expedition was, after all, an enterprise instigated and

[29] On the fortunes and achievements of some of these teams, see Woolf 1959 (note 1), passim; Helen Sawyer Hogg, 'Out of Old Books: The 1769 Transit of Venus, as Seen from Canada', *Journal of the Royal Astronomical Society of Canada* 41 (1947), 319–326; id., 'Out of Old Books: Le Gentil and the Transits of Venus, 1761 and 1769', *Journal of the Royal Astronomical Society of Canada* 45 (1951), 37–44, 89–92, 127–134 and 173–178; Angus Armitage, 'Chappe d'Auteroche: A Pathfinder for Astronomy', *Annals of Science* 10 (1954), 277–293; Doyce B. Nunis (ed.), *The 1769 Transit of Venus: The Baja California Observations of Jean-Baptiste Chappe d'Auteroche, Vicente de Doz, and Joaquín Velázquez Cárdenas de León* (Los Angeles 1982); Don Metz, 'William Wales and the 1769 Transit of Venus: Puzzle Solving and the Determination of the Astronomical Unit', *Science and Education* 18 (2009), 581–592.

[30] However, we are also reminded of the potentially dichotomous character of these two concepts. Simon Schaffer, 'Visions of Empire: Afterword', in Miller and Reill 1996 (note 2), 335–336, commenting on some of the literature.

sponsored by the British Admiralty, a fact that speaks for itself. It is through the admixture of the element of rivalry to that of negotiation that the transit observations of 1769 present a tangible instance of the mechanisms of operation in the enlightened republic of letters as an "echo chamber".[31]

The German-Hungarian astronomer Hell's expedition on Danish-Norwegian support to Vardø beyond the Arctic Circle was no exception from these qualities of the transit-enterprise of 1769: while on a scale different from the case of the British and the French, considerations of power and prestige were undoubtedly involved. Before moving on to the equally present cross-disciplinary aspects, let me briefly concentrate on the astronomical results and their afterlife devoted to often heated exchanges (later also leading to insinuations of falsification, which harmed Hell's reputation for nearly a century).[32]

Although Hell had ambitious plans for publishing the results of the expedition—a richly illustrated three-volume *Expeditio litteraria ad Polum Arcticum*, consisting of a "historical", a "physical" and a "mathematical-astronomical" volume, described in some detail in a call for subscriptions (*Nova Acta Eruditorum*, Leipzig 1770)[33]—, these plans never materialized, in no small measure because of the loss of resources at Hell's disposal soon after his return to Vienna, caused by the suppression of the Jesuit Order. The accounts that we have appeared in a few separate pieces in the *Ephemerides* over the more than twenty-year period between the journey and his death in 1792, or remain in manuscript. The published articles address the subject of the geographic latitudes of certain locations in the north of Norway and Sweden, some meteorological features of the same territories, the theory of *aurora borealis*, and—crucially—the solar parallax.[34] The *Observatio* of 1770 is significant not only on account of

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[31] Lorraine Daston, 'Afterword: The Ethos of Enlightenment', in Clark, Golinski and Schaffer 1999 (note 5), 495–504.

[32] The charges, put most forcefully by Carl Ludwig Littrow several decades after Hell's death, and the subsequent vindication of Hell by the American astronomer Simon Newcombe yet another half century later, are standard parts of the Hell saga but are of little concern to this study. See, however, George Sarton, 'Vindication of Father Hell', *Isis* 35 (1944), 97–105.

[33] Maximilian Hell, 'Expeditio Litteraria ad Polum Arcticum, in tres divisa Tomos, quorum primus Historicus, secundus Physicus, tertius Mathematicus et Astronomicus', *Nova Acta Eruditorum . . . Anno MDCCLXX*, 427–432.

[34] 'Observatio transitus Veneris ante discum Solis die 3 junii anno 1769' (1771) (previously, in Copenhagen, 1770, see note 15); 'De Parallaxi Solis ex Observationibus Transitus Veneris Anni 1769' (1772); 'Supplementum Dissertationis de Parallaxi Solis' (1773); 'Auroræ

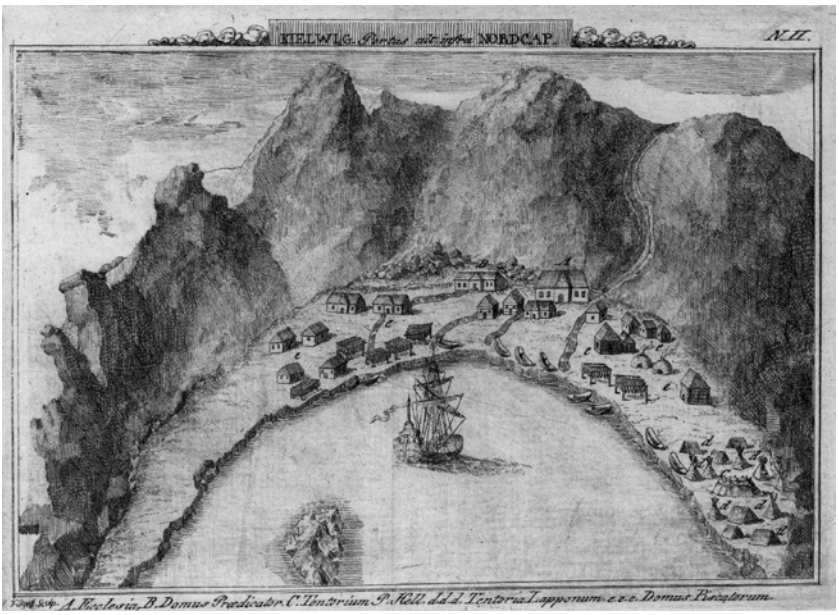

Fig. 2. The ship of Hell and his associates approaching Kjelvik, the last harbour before reaching Vardø. Published with the 'Observationes Astronomicae . . .' in the *Ephemerides* of 1791 (cf. note 34). Bern University Library.

the record of the observation of the transit and the remarkably accurate calculation of the parallax, but also the preceding methodological reflections concerning the problem of defining "contacts" (of the margin of Venus and the Sun). He explained and supported in meticulous detail his own approach of concentrating on "contacts" upon the "exit", rather than the "entry" of the disc of Venus in front of that of the Sun, referring to the much greater clarity of the former. It was on this basis that he set down his observation data, which he later collated with others he managed to obtain from other observation posts, including the ones in South America and Tahiti, to calculate the solar parallax.

The fact that, contrary to expectations and in spite of Lalande's reminders, Hell decided not to send the results of his observations to Paris but

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Borealis Theoria Nova . . . Pars I' (1777); 'Observationes Astronomicæ Latitudinum, & Longitudinum Locorum Borealium Daniæ, Sueciæ, Norwegiæ, & Finnmarchiæ Lapponicæ per iter arcticum Annis 1768, 1769 & 1770 factae' (1791); 'Observationes Metorologicæ factæ Wardoehusii Annis 1768, & 1769' (1792).

to make them public in Copenhagen (what is more, with some delay),[35] gave rise to bad feelings and suspicions about the authenticity of his data. Lalande, in particular, was resentful for this apparent non-compliance with the supposed consensus of the scientific community about the manner of procedure.[36] While the publication of the data eventually quelled this uneasiness, one is tempted to interpret Hell's conduct as a deliberate attempt to redraw the map of the "republic of astronomy" by turning Copenhagen into a "centre" and refusing to behave vis-à-vis Paris like a mere observer sent to a "periphery". Further study of the sources may confirm this impression, but Sajnovics' journal of the expedition and the portion of Hell's correspondence which I have been able to consult so far, are silent about any conscious design to this effect. In any case, what is certain is that such tensions reveal complexities already referred to. Hell undoubtedly felt obliged to consider the role assigned to him and the expedition by his sponsor who—and in this sense the Arctic venture is a parallel case to the one in Arabia just a few years earlier—expected the outcomes to be first reported in Copenhagen. As he wrote to Pater Höller, one of his Jesuit brethren, on 6 April 1769 (before the observation of the transit, and concerning the linguistic and ethnographic aspects of the expedition—but establishing a general principle), they were going to report "astonishing things" to their superiors, but for the time being they should "quietly keep these to themselves, for propriety requires that they are first brought to the knowledge of the Danish king".[37] Even the sporadic and rudimentary news that appeared in the Viennese press about Hell's team during their nearly year-long stay at Vardø were resented in the Danish capital. No wonder that Hell, after their return from the North in mid-October 1769, decided to stay there for more than another half a year, setting the record straight by holding lectures and editing the results for printing, only reaching Vienna again in August 1770.

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[35] The transit took place on 3 June 1769. Hell and his associates left Vardø on 27 June, and reached Copenhagen on 17 October. They first reported on the expedition at the Academy of Sciences there on 24 November.

[36] Woolf 1959 (note 1), 177–178.

[37] Selections from Hell's correspondence have been made available in the original in Pinzger 1920/1927 (note 1), II: 93; in Hungarian translation in *A csillagász Hell Miksa írásaiból* [Selected Writings of the Astronomer Maximilian Hell], ed. by György Gábor Csaba (Budapest 1997), 50.

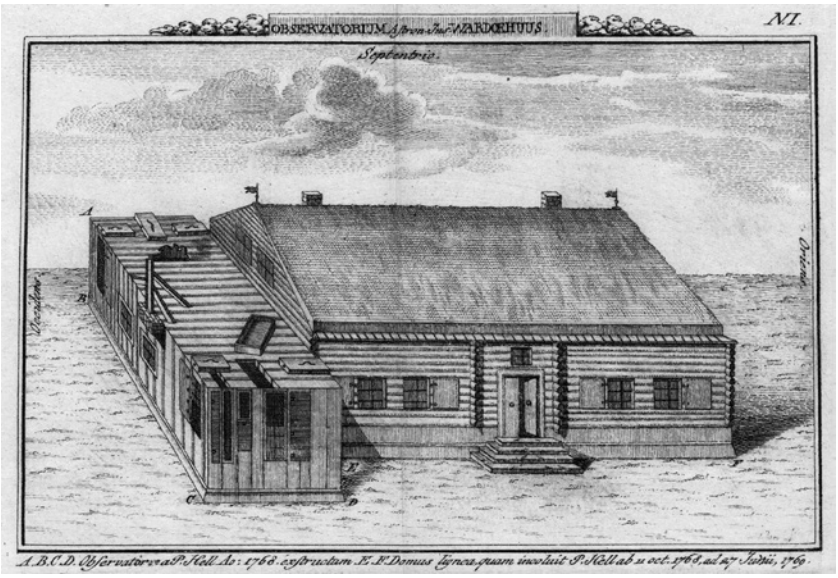

Fig. 3. Hell and Sajnovics' house at Vardø, with the extension built for the purpose of astronomical observation on the left side. (Cf. the upper left of Fig. 1.) Published with the 'Observationes Astronomicae . . .' in the *Ephemerides* of 1791 (cf. note 34). Bern University Library.

Language and the Dilemma of Ethnic Origins: Hungarians, Scythians and Lappians

Let us now turn to the other, cross-disciplinary dimension of the enterprise, which was accurately, if synoptically, indicated by Hell both in the introductory section of the *Observatio*, and the call for subscriptions of the unaccomplished *Expeditio Litteraria*. The expedition targeted a virtually unexplored geographic area, not reached by the famous predecessors in the region. The 1732 Lapland expedition of Linnaeus was motivated by "the utility of scientific journeys within the fatherland": sponsored by the Uppsala Royal Society for Science, it was a patriotic venture to explore "natural" resources from minerals through plants and animals to local technologies and ethnography, with an eye to the "economical" and to classifying the finds as national secrets.[38] At the same time, the regions of

[38] For the cameralist style preoccupation of "Linnean travel" with an endeavour to explore and establish a frame for rationalistically governed autarchy, see, besides the work

the far north were subject to a scientific exoticism that in certain respects is reminiscent of the curiosity about distant continents. In 1736–1737, a French geophysical survey headed by Pierre Louis Moureau de Maupertuis and intent on determining the shape of the earth once and for all had travelled to northern Scandinavia ("Laponie" as they exoticized the Torne Valley where they carried out their triangulations).[39] In a way, the Hell expedition aimed to unite the features of these two enterprises. Although in terms of subject matter unrelated to the issue of the transit of Venus, the main preoccupation of the expedition, Hell assured the readers of the *Observatio* that "nor have we neglected the facts that throw light on or supplement the natural history of the animal and vegetable world, such as mussels, herbs, algae, mosses, and making other observations especially useful in regard of their economic applications" and the "origins, language and different dialects of the Lappian nation living scattered in the North". Thus, even if "as a result of adverse weather conditions . . . I were to be disappointed in regard of the often mentioned observation, this scientific expedition were still not entirely fruitless for the sciences and the useful arts".[40] The expedition held out the promise of a wealth of new information capable of breaking new ground in several fields of knowledge, which Hell expressed in the enlightened language of improvement.

Apart from Hell's theory of Northern Lights and a few weather reports, nothing was published of the "physical volume" of the *Expeditio Litteraria*. The proposed contents of the *tomus historicus* fared much better. Although the diary kept throughout the more than two years between their departure from Vienna and arrival back there got never published, a version of the proposed ethnographic, linguistic and historical treatment of the Sámi (i.e. Lappians) appeared soon after their return in the form of Sajnovics' treatise *Demonstratio. Idioma Ungarorum et Lapponum idem esse* (Tyrnau 1771—extended Latin version of the text already published in Danish in Copenhagen in the previous year). True, among the scientific and learned public of Western Europe it received considerably less attention than even the partial accounts of the astronomic results of the expedition. In Hell's and Sajnovics' native land, however, the situation was the

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of Lisbet Koerner (note 18), Tore Frängsmyr, *Linnaeus: The Man and His Work* (Berkeley 1985); Sverker Sörlin, 'Scientific Travel: The Linnean Tradition', in Tore Frängsmyr (ed.), *Science in Sweden: The Royal Swedish Academy of Sciences 1739–1989* (Canton 1989), 96–123.

[39] Mary Terrall, *The Man Who Flattened the Earth, Maupertuis and the Sciences in the Enlightenment* (Chicago 2002). The expedition to Lapland is discussed in chapter 4.

[40] Hell 1770 (note 15), 4.

exact opposite, and the reasons for this were to be found in the peculiar cultural-political atmosphere of the times in the Kingdom of Hungary and her relations with the Habsburg administrative centre. The rest of this study contextualizes the reception of the ethnographic-linguistic findings of the expedition in Hungary.

Sajnovics was initially rather unenthusiastic about the task of studying the possible relation between Hungarian and Sámi, but under the influence of Hell—who was aware of the widespread preoccupation with Nordic cultures in contemporary Europe in general as well as some of the specific literature—, and especially the experience of the first encounters with natives along the journey, his interest gradually awoke. The *Demonstratio* is considered a landmark in Finno-Ugrian historical linguistics whose methodologically innovative features—especially the fact that beyond vocabulary and tone, he put a great emphasis on grammatical comparison in demonstrating linguistic kinship—eclipse such dilettante aspects of the work as the derivation of the Lappians from northern China, and the further speculation on the kinship of Hungarian and Chinese (prompted by Hell and the recognition, in a Chinese vocabulary, that certain Chinese words when read backwards resemble Hungarian ones). It both fitted into the development of eighteenth-century linguistic studies, and gave them further impetus, which was usually recognized by contemporaries in Europe.[41]

By itself, the positing of the kinship of Hungarian and Lappian was nothing new; nor, it must be added immediately, was it the achievement of Sajnovics' work as a piece of academic linguistics that it met a torrent of response, predominantly negative, in Hungary. Ever since the Hamburg scholar Martin Fogel (Fogelius), mainly on the basis of shared etymologies, first raised the idea seriously in *De lingua indole Finica Observationes* (1669), the notion of a Finno-Ugrian community of languages and the special relationship of Finnish, Lappian and Hungarian recurred in the work of scholars from several European countries: Swedes (including Philipp Johann von Strahlenberg, the first to focus on the comparison of the "most ancient" stock of vocabulary: numerals, limbs, simple tools and actions), Germans (such as Leibniz, as well as Fischer, already referred to in my introduction), and Hungarians. Among the latter, the remarkable

[41] For a concise discussion in English, see Zsuzsa Vladár, 'Sajnovics's *Demonstratio* and Gyarmathi's *Affinitas*: Terminology and Methodology', *Acta Linguistica Hungarica* 55 (2008), 145–181.

Lutheran antiquarian scholar Dávid Czvittinger was the first to embrace the Finno-Ugrian theory in his *Specimen Hungariae Litteratae* (1711). There were several others to prepare the ground for Sajnovics, including individuals who did so despite their uneasiness with the theory, such as Mátyás (Matej) Bél, who presumed to identify the remnants of the "Hungarian-Scythian" language in Finnish.[42]

The idea of a prestigeous steppe kinship of the Hungarians with the mighty Huns, which is also apparent in Bél's mild statement, was the standard narrative of the subject matter ever since the early Middle Ages.[43] It became firmly tied up with the theory of a corporate polity, in which the scions of an (originally) military aristocracy enjoy pre-eminence, in the *Gesta Hungarorum* of Simon Kézai (1282/1285). Scythianism refers to both a theory of national origins and the privileged status of those defined as members of the *corpus politicum* after the dissolution of the ancient self-governing community, which ensued because of the contempt of some for the call to arms issued "in the name of God and the people". It then received reinforcement from legal humanism in the *Tripartitum* of István Werbőczy (1517),[44] a culmination of the centuries-old process of collecting "the customary law of noble Hungary", and was still a staple of Hungarian late baroque noble consciousness, also underpinned by the traditional classification of the Hungarian language as one of the "oriental" languages, along with Turkish and Mongolian, (and Hebrew, and Chaldean, and Arabic, and Armenian, and Persian . . .). Questioning one pillar of this complex intellectual edifice constituted a challenge to the entire ideological frame and, especially in politically critical times, could expect an appropriate response.

This is more of less what happened in the case of the *Demonstratio*. In regard of its reception it is meaningful to distinguish between the

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[42] In this sketch I am relying on Péter Domokos, *Szkítiától Lappóniáig. A nyelvrokonság és az őstörténet kérdéskörének visszhangja* [From Scythia to Lapponia. Echoes on the Problem of Linguistic Kinship and Ancient History] (Budapest 1998).

[43] For a brief introduction to this tradition and its ideological significance, see László Kontler and Balázs Trencsényi, 'Hungary', in Howell Lloyd, Glenn Burgess and Simon Hodson (eds.), *European Political Thought 1450–1700. Religion, Law and Philosophy* (New Haven 2007), 180–181 and 185–186; for more details, see Jenő Szűcs, 'Theoretische Elemente in Meister Simon de Kézas "Gesta Hungarorum" (1282–1285). Beiträge zur Herausgestaltung des "europäischen Synchronismus" der Ideenstrukturen', in id., *Nation und Geschichte* (Köln and Wien 1981), 263–328.

[44] Several studies in Martyn Rady (ed.), *Custom and Law in Central Europe* (Cambridge 2003).

international and academic on the one hand, and the domestic and lay-literary on the other hand. Already in the *Allgemeine nordische Geschichte* (1771), relying extensively on Fischer's books already mentioned, the famous Göttingen scholar August Ludwig Schlözer recognized Sajnovics' achievement, and later encouraged Sámuel Gyarmathi's work, who pursued Finno-Ugrian research beyond Sajnovics in both methodological and empirical terms.[45] In fact, strictly academic circles almost invariably welcomed Sajnovics' theory in Hungary too. Even the Jesuit scholar, György Pray, the greatest contemporary authority in historical research, felt compelled to modify his earlier views on the subject in his *Dissertationes historico-criticae in annales veteres hunnorum, avarum et hungarorum* (1775)—although, like Bél before him, by simply claiming a Hun pedigree for Finno-Ugrian peoples as well.[46] It must also be added that the only *linguist* to champion the alternative concept in Sajnovics' lifetime, György Kalmár, published his relevant work nearly simultaneously with the *Demonstratio*, so his *Prodromus idiomatis Schytico-Mogorico-Chuno-(seu Hunno-) Avarici, sive adparatus criticus ad linguam Hungaricam* could not have been a response to Sajnovics.[47] In other words, the issue here was not (yet) that of an academic debate,[48] the more so as contemporary

[45] For Schlözer and his Hungarian connections, see Éva H. Balázs, 'A Magyar jozefinisták külföldi kapcsolataihoz' [About the International Connections of Hungarian Josephinists], *Századok* 97 (1963), 1187–1203; János Poór, 'August Ludwig Schlözer und seine ungarländische Korrespondenz', in Alexadru Duţu, Edgar Hösch and Norbert Oellers (eds.), *Brief und Briefwechsel in Mittel- und Osteuropa im 18. und 19. Jahrhundert* (Essen 1989); István Futaky, *Göttinga. A göttingeni Georg-August Egyetem magyarországi és erdélyi kapcsolatai a felvilágosodás idején és a reformkor kezdetén* [Göttingen. The Hungarian and Transylvanian Contacts of the Georg-August University during the Time of Enlightenment and the Reform Era] (Budapest 2007).

[46] Domokos Kosáry, *Művelődés a XVIII. századi Magyarországon* [A Cultural History of Hungary in the Eighteenth Century] (Budapest 1980), 575. In the abridged English edition, there are short summaries of eighteenth-century historical and linguistic scholarship, as well as the literary and cultural significance of the noble "bodyguards" (see below). Id., *Culture and Society in Eighteenth-Century Hungary* (Budapest 1987), 149–154, 160–162 and 195–200.

[47] Zoltán Éder, 'Újabb szempontok a *Demonstratio* hazai fogadtatásának kérdéséhez' [New Perspectives on the Domestic Reception of the *Demonstratio*], in id., *Túl a Dunatájon. Fejezetek a magyar művelődéstörténet európai kapcsolatai köréből* [Beyond the Danube Region. Chapters from the European relations of Hungarian Cultural History] (Budapest 1999), 49.

[48] This somewhat revisionist view of Hungarian scholarship on the subject is summarized, with references to the now extensive literature, in Réka Lőrinczi, 'Megjegyzések és adalékok a finnugor nyelvrokonítás fogadtatásához' [Observations and Contributions on the Reception of the Finno-Ugrian Kinship Theory], *Nyelvtudományi Közlemények* 97 (2000), 261–272. During the subsequent century, however, a veritable "Ugrian-Turkic war"

scholars used the terms "linguistic family" or "linguistic kinship", if ever, metaphorically at best, and without any clearcut frontlines between, say, the Scytho-Hungarian and the Finno-Ugrian "schools".[49]

Enlightened Racism, or One's Former Self as Other

There was, however, one important and influential group on the public intellectual scene, which acutely realized the *political and ideolgical* stakes of the matter, and reacted accordingly: the men of letters of noble origin who dominated that scene before the 1780s and included, besides the chief Hungarian "Voltaireans" like Lőrinc Orczy and János Fekete, Ábrahám Barcsay, whose poetry gave expression to sensibility as well as anti-court political sentiment, and György Bessenyei, the emblematic figure of the Hungarian Enlightenment as a whole. Together they gave voice to the sentiments of a sizeable elite group whose cultural and intellectual horizons, thanks to their education as members of Maria Theresa's famous Hungarian Guards,[50] were broadly European, but whose vision of the future restoration of the erstwhile greatness of the Hungarian nation was predicated on galvanising their own class to a new dynamism through modern letters and knowledge practices. This was a vision of improvement which, in their own view, depended on maintaining a discourse of identity built on a prestigious pedigree and social exclusiveness, both under serious attack from the mid-1760s on by the Viennese court and government, towards which their attitudes were therefore highly ambivalent. In this atmosphere, the implications of Finno-Ugrianism—understood by them

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gradually unfolded and culminated in the 1860–1870s, among linguists and ethnographers, in which the notions of linguistic, cultural and genetic affinity and kinship became increasingly confounded.

[49] Béla Hegedűs, 'Kalmár György a magyar nyelv származásáról' [György Kalmár on the Origin of the Hungarian Language], in István Csörsz Rumen, Béla Hegedűs and Gábor Tüskés (eds.), *Historia litteraria a XVIII. században* [Historia Litteraria in the Eighteenth Century] (Budapest 2006), 300.

[50] On the Hungarian Guards, with references to the figures mentioned, see László Deme, 'Maria Theresa's Noble Lifeguards and the Rise of the Hungarian Enlightenment and Nationalism', in Béla Király and Walter Scott Dillard (eds.), *The East Central European Officer Corps, 1740–1920s: Social Origins, Selection, Education, and Training* (Boulder 1988), 197–212. The Hungarian language literature is respectable. However, historians have hitherto largely yielded the field to literary scholars, whose main preoccupation has been the rise of vernacular literature, and are yet fully to discover the subject and approach it with their own questions. The standard monograph is Ferenc Bíró, *A felvilágosodás korának magyar irodalma* [Hungarian Literature in the Age of Enlightenment] (Budapest 1994), especially 69–92 and 161–185.

as not only linguistic but also ethnic kinship—seemed to them highly disturbing.

Barcsay's poetry abounds in rebuffs addressed to Sajnovics whose "yoke" was perceived by him a vital threat to ancient liberties, established on the cornerstone of the idea that Hungarians are "the valiant grandsons of Scythians". Similarly, in his "The Errors of Star-Watcher Sajnovits and Hell Being Refuted", Orczy casts doubt on the allegation that the progeny of Alexander the Great's brave opponents should be related to mere Lappians munching on dried fish—but recommends "the astronomer" to return to these "kind relatives" of *his*: a hint at Sajnovics' *Slavic* ethnic background. This tacit reference to Slavic mischief as a possible background to Sajnovics' work leads us to the political context. Just a few years earlier, the diet of 1764–1765 ended in bitter estrangement between the Hungarian nobility and the Viennese government, the court having failed to push through a package of administrative and social reforms which drew inspiration from the work of the newly established chairs of cameralist sciences and natural law at the University of Vienna, hallmarked by the names of Karl Anton von Martini and Joseph von Sonnenfels.[51] Court propaganda on behalf of the proposed measures received a boost from a treatise by Adam Franz Kollár, *De originibus et usu perpetuo potestatis legislatoriae circa sacra apostolicorum regum Ungariae*. Kollár, who was proud of his Slovak commoner origins, called into question many of the political and social privileges of the Hungarian ecclesiastical and secular elites, criticizing Werbőczy in especially sharp terms, and causing great consternation among the clergy and the nobility. Characteristically, Kollár's anti-feudal polemics was readily associated by this constituency with anti-Hungarian sentiment, identified in his commentary on *Hungaria*, a work by the sixteenth-century humanist Miklós Oláh (Nicolaus Olahus), which Kollár edited and published in 1763.[52] These comments, which refer to the statistical minority of Hungarians in the Kingdom of Hungary and predict the gradual demise of the language as well as the nation itself, became European currency through being quoted in Schlözer's *Allgemeine nordische Geschichte*, which in turn seems to have inspired

[51] For a contextualized assessment of these initiatives, see Grete Klingenstein, 'Between Mercantilism and Physiocracy. Stages, Modes and Functions of Economic Theory in the Habsburg Monarchy, 1748–1763', in Charles Ingrao (ed.), *State and Society in Early Modern Austria* (West Lafayette 1994), 181–214.

[52] Cf. Evans 1990 (note 11), 196ff.; Dezső Dümmerth, 'Herder jóslata és forrásai' [Herder's Prophecy and Its Sources], *Filológiai Közlöny* (1963); id., 'Kollár Ádám problémája' [The Ádám Kollár Problem], *Filológiai Közlöny* (1967).

Herder's famous "prophecy" to the same effect. The latter's prediction that the Hungarian nation, amidst the "ocean" of Slavic peoples, will inevitably perish, was underpinned by his theory (available in publication for the first time also in the late 1760s and early 1770s) on the crucial role of language in the formation of human identities. Herder claimed that "all conditions of awareness in [man] are linguistic"—thus, as language acquisition took place in communities, reason and the capacity of thinking, the very distinguishing feature of the human animal, was bound to have as many modes as there were human communities.[53] Members of the Hungarian intellectual elite had good reasons for being attentive to his views, and also for taking them as an alarm bell. These developments also established Schlözer's notoriety as an "anti-Hungarian", apparently confirmed by the fact that his social and political views were based on the same foundations as the Viennese reformers—no wonder that the next, "Josephist", generation of young enlightened Hungarians cultivated his courses at the University of Göttingen.[54] In any case, by championing the Lappian cause, for an influential segment of the contemporary enlightened political public, Sajnovics and his mentor Hell seemed to be the Jesuit hirelings of a hostile court, employed in a plot which also involved willing collaborators from the camps of old and new national enemies, Germans and Slavs.[55]

Finally, in many ways, Bessenyei is a category of his own with his comprehensive programme urging the improvement of public happiness through the cultivation of the arts and sciences, of historical and political knowledge in the vernacular. His engagement with the topic of national

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[53] Johann Gottfried Herder, *Treatise on the Origin of Language* (1772), in *Philosophical Writings*, trans. and ed. by Michael N. Forster (Cambridge 2002), 131 and 150. See also *Fragments on Recent German Literature* (1767–1768), ibid., 49.

[54] On the central role of the University of Göttingen as a point of orientation and a source of inspiration for the rank-and-file of Hungarian Josephists, see Éva H. Balázs, *Berzeviczy Gergely, a reformpolitikus (1763–1795)* [Gergely Berzeviczy, the Political Reformer] (Budapest 1967), 86–117. Some of the argument is worked into the same author's *Hungary and the Habsburgs 1765–1800. An Experiment in Enlightened Absolutism* (Budapest 1997).

[55] A Google search on Hell and Sajnovics demonstrates in a few seconds that this representation is still alive and well among a somewhat less enlightened segment of the political public.—Late eighteenth-century attitudes to Jesuits, both before and after the dissolution of the order, were diverse. On the one hand, in scholarly circles there was a great deal of mutual respect and communication between Jesuits and Protestant scholars, and even personally expressed sympathy by the latter on the occasion of the dissolution. On the other hand, in the public-political domain the old Protestant topoi about the "conspiratorial bent" of the Jesuits remained common currency.

origins, and thus (ethno-)linguistic kinship, was conceived in the peculiarly eighteenth-century genre of philosophical history, works which also highlight the fundamental principles of this programme, in all their ambiguity.[56] In many ways, he employed the standard enlightened narrative to give an account of Hungarian history in a European framework as the successive stages of the "mitigation" of rude manners, resulting from religion and learning, but also claimed that military glory and polite letters, rather than being antagonistic, could mutually supplement one another.[57] This, of course, nicely dovetailed with his overall conviction that *vera nobilitas* could derive from proficiency in letters as well as armsbearing. Assigning an unassailable social pre-eminence to the nobility on account of its historical roles, what he sought was a new justification for these roles, to be found in superior learning, while he still regarded the gulf that separated the nobility from the commoners, especially the peasantry as unbridgeable—and supported this from Werbőczy in a political terminology recalling the staples of Scythianism.[58] Thus the ideological stakes of the available discourses of origin, to which the position taken by Sajnovics was directly relevant, were as formidable for him as for any of the above authors.

Though Bessenyei's relevant statement—significantly enough, contained in a work entitled *Magyarországnak törvényes állása* [The Legal Status of Hungary]—derives from the times of his retirement to his estate, some thirty years after Sajnovics' treatise burst onto the scene, in it he

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[56] On Bessenyei's project and its different aspects, see Ferenc Bíró, 'A szétszórt rendszer (Bessenyei György programjáról)', in Sándor Csorba and Klára Margócsy (eds.), *A szétszórt rendszer. Tanulmányok Bessenyei György életművéről* [The Fragmented System. Studies on the Oeuvre of György Bessenyei] (Nyíregyháza 1998), 25–36. On some aspects of Bessenyei's work in the genre of philosophical history, see Olga Penke, *Filozofikus világtörténetek és történetfolozófiák. A francia és a magyar felvilágosodás* [Philosophical Histories and Histories of Philosophy. The French and the Hungarian Enlightenment] (Budapest 2000), 176–183 and 211–218.

[57] The latter principles were developed in Bessenyei's *A magyar néző* [The Hungarian Spectator, 1778], to be supported with a historical argument in *A magyar nemzetnek szokásairul, erköltseirül, uralkodásának modjairul, törvényeirül, és nevezetesb viselt dolgairul* [The Customs, Manners, Modes of Government, Laws and Important Deeds of the Hungarian Nation, 1778] and its appendix on "the form of the whole of Europe in the eleventh century (*Egész Európa' formája a XIdik Században*—excerpted from Voltaire's *Essai sur les moeurs*, chapters 39–46), intended to demonstrate that in those times Hungarians were not any more barbarous than other European nations.

[58] György Bessenyei, 'A törvénynek útja' [The Course of the Law, 1777], in *Bessenyei György összes művei. Társadalombölcseleti írások, 1771–1778*, ed. by Péter Kulcsár (Budapest 1992), 175 and 177.

advanced views most probably first developed and discussed with other opponents, back in the 1770s. Bessenyei bluntly claimed that "it is impossible to displace something of such a great consequence, on the basis of so little a circumstance [as language], and set it on a different footing", and suggested that "instead of words, one should consider moral character and manners" (the standard analytical categories of philosophical history). This lens shows the "Scythian" and the "Lappon" to be separated by a yawning gap: in the subsequent representation, the latter becomes the target of consistent "othering" by Bessenyei. In contrast to the people of Attila, marked by "its thirst for triumph, valour and glory, as well as its sagacity required for domination", the "Lappon" was deformed in his outward appearance as well as his manners: on top of his "ugliness of form, the Lappon is vile and fearful, it is such a subterranean mole of a Nation, which loathes the fight, and never wages war."[59]

We are dealing here with an interesting paradox. Bessenyei defended a view of national origins which was scientifically obsolete and was under challenge by one that was sound. The former theory, Scythianism, was deployed by him, in the best traditions of Enlightenment social science, with reference to the category of manners and virtues (or the lack of them), while at the same time in the polemic against "Lappianism" coming dangerously close to being conveyed in racial terms. To be sure, this combination was by no means unusual among eighteenth-century scholars: suffice it to refer to the derogatory observations of Cornelius de Pauw to the natives of North America,[60] or—in an academic environment with which late eighteenth-century Hungarians were intimately familiar—the unflattering classification of the "Mongol" race (supposedly giving rise to the peoples of Eastern Asia, North America and Africa) by the Göttingen

[59] *Bessenyei György összes művei. Prózai munkák, 1802–1804* [The Complete Works of György Bessenyei: Prose Works], ed. by György Kókay (Budapest 1986), 231–235. The passage is almost a literal translation from the national characters in Dom Joseph Vaissete's *Géographie historique, ecclésiastique et civile, ou description des toutes les parties du Globe terrestre* (Paris 1755).

[60] For the classic exploration on de Pauw's thesis on the inferiority of native Americans and the debate provoked by it, see Antonello Gerbi, *The Dispute of the New World. The History of a Polemic, 1750–1900* (Pittsburgh 1973), chapter 3; for developments upon Gerbi's perspective, see Jorge Cañizares Esguerra, *How to Write the History of the New World: Historiographies, Epistemologies and Identities in the Eighteenth-Century Atlantic World* (Stanford 2001), chapter 1; Silvia Sebastiani, *I limiti del progresso. Razza e genere nell'Illuminismo scozzese* (Bologna 2008), passim, especially chapters 3–4.

historian Christoph Meiners.[61] However, language, although recognized as an important racial marker—and a more inherent one than manners—did no more seriously enter into their considerations than in those of Bessenyei. This sort of "enlightened racism" was tailor-made to the Hungarian writer's agenda, a programme of elevating the cultural level of the country, in the conviction that while martial valour is capable of being translated into virtue in letters, dumb and smelly fishermen would never attain to this. Kinship with the latter was therefore repudiated in violent terms of othering, together with the phenomenon of language as representing any *analytical* value, albeit—to amplify our paradox—its cultivation, as a *tool* of improvement, was deemed by Bessenyei indispensable for the achievement of his ends. However much he claimed, famously, that "as long as her own language remains uncultivated, no Nation in this World will become learned in foreign tongues,"[62] he retained his scepticism about language as the constitutive element of community. Hungarian enlightened patriots like him continued to insist on the role of "virtue" in cementing the community, only they urged that virtue in arms ought to be replaced by "virtue in letters", i.e., promoting improvement. The scientifically sound Finno-Ugrian theory on the other hand gave a boost to ethno-linguistic definitions of nationhood, which started to emerge in the context of efforts by the same enlighteners who dismissed that theory but still fostered the cultivation of the mother tongue with a view to the requirements of socio-cultural progress. Conversely, Hungarian ethno-nationalism, which received an initial impetus from the discovery of Finno-Ugrian theory, has yet continued—to this day—to take immense satisfaction in the Scythian myth.

While Hell and Sajnovics were astronomers by employment, they possessed a broad-ranging erudition not only in the physical and mathematical sciences, but also in each of the diverse fields which they set out to explore during the expedition. The latter was therefore conceived by them—on the testimony of Hell's views expressed in the preface to the *Observatio*, but also Sajnovics' journal—as a unitary scientific enterprise. Yet this unity crumbled in the reception. While in Copenhagen

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[61] Friedrich Lotter, 'Christoph Meiners und die Lehre von der unterschiedlichen Wertigkeit der Menschenrassen', in Hartmut Boockmann and Hermann Wellenreuther (eds.), *Geschichtswissenschaft in Göttingen* (Göttingen 1987), 30–75; Luigi Marino, *Praeceptores Germaniae. Göttingen 1770–1820* (Göttingen 1995), 110–120.

[62] György Bessenyei, *A Holmi* [Paraphernalia], ed. by Ferenc Bíró (Budapest 1983), 32.

and Trondheim Sajnovics was rewarded with academy membership for the findings of the *Demonstratio*, which also stimulated the interest of Schlözer at Göttingen and caused a great deal of agitation in Hungary, elsewhere it seems to have been taken little notice of. Conversely, while Hell's *Observatio* was quite extensively reported and reviewed in international venues of scientific communication, in Hungary—no doubt, in a large measure because of the virtual absence of such venues—appreciation for the team's achievements in astronomy remained sporadic, and in the existing fora of learned sociability references to their being "star-watchers" were ironic, intended to question their competence in the fields of language and ethnography. The reasons for this discrepancy may be partially found in the failure of Hell's grandiose—and perhaps not entirely realistic—project of serial publication. It may also have to do with the rather different character and level of technicality involved in astronomical versus linguistic-ethnographic discourse and the concomitant divergence of the respective audiences. There is much further research to be done on each of these aspects, and many more. For the time being, one needs to stress once again the complexity, even inconsistency of contexts—aims and intentions, collaborations, simultaneities, conflicts—in whose hub the expedition can be located. It was these contexts, many of them definitely outside the domain of "pure science", that decisively influenced the selection strategies which local agents applied vis-à-vis the results of a scientific venture which its chief protagonists regarded as one and indivisible.

HISTORY IN A TEST TUBE: NATURAL HISTORIANS' STRATAGEMS FOR COMMUNICATING EMPIRICISM AND THEORY

Annette Meyer

Generational Change: Types of Scholars of the High and Late Enlightenment

In historical accounts the figure of Albrecht von Haller was frequently used to distinguish the typical scholar of the high Enlightenment from that of the late Enlightenment. Although in the main treatments of the history of science Haller is firmly fixed as a Newtonian from the outset,[1] in overviews of natural history he is characterised primarily as the last polymath, a persistent theorist of preformation, and a remaining exponent of the old, classifying method. This older form of natural history by tabulation had, according to sociologist Wolf Lepenies in his seminal study of this subject, reached a highpoint of crisis with Haller and was subsequently replaced by a new form of the history of nature.[2] Although Haller fits the ideal image of the polymath of the early modern period, he was thus nonetheless said to have been unable to recognise some of the forward-looking potential of modern scientific development due to the constraints of his traditional religious worldview.

This view of Haller, as well as of other protagonists in the history of science, has been criticised as an anachronistic approach that overlooks the original contributions Haller made in his own time.[3] Beyond this criticism of the teleological approach of modern history of science, which considered the "scientificity" of perception, inventions and judgements to be endangered when knowledge and belief appeared to be entangled in supposedly improper fashion,[4] it is of interest to note that Haller saw himself

[1] Shirley A. Roe, 'The Life Sciences', in Roy Porter (ed.), *The Cambridge History of Science*, vol. 4: *Eighteenth-Century Science* (Cambridge 2003), 397–416: 402.

[2] Wolf Lepenies, *Das Ende der Naturgeschichte. Wandel kultureller Selbstverständlichkeiten in den Wissenschaften des 18. und 19. Jahrhunderts* (Frankfurt/M. 1978), 62.

[3] Richard Toellner, 'Medizin in der Mitte des 18. Jahrhunderts', in Rudolf Vierhaus (ed.), *Wissenschaften im Zeitalter der Aufklärung* (Göttingen 1985), 200.

[4] Bruno Latour provided the clearest account of this method of the "second Enlightenment . . . of the nineteenth century", describing it as consisting in qualification of "all earlier thought" as a prelude to modern science and, thus, as "unusable or imprecise". See

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as a witness to epochal change. He reflected on the question of the future of the sciences, as well as the shift in perspectives that could result from generational change and the risks it involved.

The present article attempts to explore this change in perception in the field of natural history and to illustrate it by referring to the methodological reflections of those who studied this field, beginning with Haller and his view of himself as a natural historian.[5] The representatives of the Scottish Enlightenment are an appropriate counterpoint to Haller in this frame of reference, as they not only applied the concept of natural history in numerous ways but also did a great deal to give it a further theoretical basis. In the hands of Scottish scholars, *natural history* grew to become more than an encyclopaedic compilation of the empirical facts of nature described by the term *historia naturalis*. By contrast, *natural history* offered a suitable context for developing methods and for understanding newly generated knowledge—whether in cosmology, natural philosophy or anthropology—and was no longer considered as an irritation of the established world-view but as the basis of a new one. Jean Starobinski has described this method of Enlightenment philosophy as a "remedy" [remède] that was meant to cure the contradictions of the modern world.[6] This difficult remedy, however, also required legitimisation of the stratagems [légitimation de l'artifice] applied as a reaction to fundamental changes in perspective and to the

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Bruno Latour, *Wir sind nie modern gewesen. Versuch einer symmetrischen Anthropologie* (Frankfurt/M. 1998), 51.

[5] Bettina Dietz has most recently called attention to the disproportion between the mass of studies in natural history produced in the eighteenth century and the small amount of sporadic scientific research done on them so far. Bettina Dietz, 'Naturgeschichte, Epistemologie und Material Culture. Eine Einführung', in Ulrich Johannes Schneider (ed.), *Kulturen des Wissens im 18. Jahrhundert* (Berlin and New York 2008), 595–587. Although Michel Foucault already designated natural history as one of the most fruitful fields with respect to the epistemological transition on the threshold of the modern age, following the pioneering study by Wolf Lepenies, a systematic synopsis of the genre is still lacking. In the Anglo-Saxon world in particular, research frequently focuses on the history of biology. See Paul Lawrence Farber, 'Natural History', in Alan Charles Kors (ed.), *Encyclopedia of the Enlightenment* (Oxford 2003), 124–130. As a consequence, other fields of study are not given due attention, such as cultures, customs and humankind, whose rich perspectives are presented in a volume compiled by Nicholas Jardine, Jim Secord and Emma Spary (eds.), *Cultures of Natural History* (Cambridge 1996). The best systematic overview of the change in the concept of natural history is still Phillip R. Sloan, 'Natural History 1670–1802', in Robert C. Olby et al. (eds.), *Companion to the History of Modern Science* (London and New York 1996), 295–313. See also Phillip R. Sloan, 'The Gaze of Natural History', in Christopher Fox, Roy Porter and Robert Wokler (eds.), *Inventing Human Science: Eighteenth-Century Domains* (Berkeley, Los Angeles and London 1995), 112–151.

[6] Jean Starobinski, *Le remède dans le mal. Critique et légitimation de l'artifice à l'âge des Lumières* (Gallimard 1989).

uncertainty resulting from a rapidly changing world. Starobinski discovered such stratagems in completely new theoretical models of interpretation in the Enlightenment literature, by means of which empirical material and new worldviews were communicated.

Epoché as a Maxim of the Natural Historian: Haller and Hume

In the context of research on Haller, it hardly needs to be mentioned that it is he who deserves credit for the dissemination of Isaac Newton's ideas and the widespread enthusiasm about his genius, at least throughout German-speaking Europe, but also beyond. Haller and his teacher, Herman Boerhaave, shared the opinion that new findings in natural philosophy could be made only through observation and experiment, as Newton had demonstrated. From this perspective, the particular contribution of Newtonian physics was, above all, that a worldview which had been shaken in many respects had again been brought into balance: the discovery of two basic forces had restored the perfect order of creation. The image of a single, perfect divine force at work since the origin of the world had found its scientific expression in an empirically ascertainable law—the law of gravity. This restoration of the order of creation was the prerequisite for unlocking the universal laws inherent in this order; this applied to natural philosophy as well as to natural history as its empirical databank. Boerhaave already determined, however, that understanding the "last metaphysical and the first physical causes" was "not necessary for the physician, nor useful or possible". Haller underscored this view and even sharpened it with respect to his own field of research.[7] Anatomy should be content with observation of phenomena and not attempt to formulate universal theories. Regarding the distinction he had discovered between the irritable and the sensible parts of the human body, he wrote:

> A theory, however, about why these two qualities are not present in some parts of the body but occur in other parts—such a theory, I must say, I cannot promise; for I am convinced that the source of both of these forces is hidden in the innermost construction, and that it is far too subtle to be discovered with the aid of the anatomical knife or the microscope. Concerning

[7] This interpretation follows the groundbreaking studies by Richard Toellner, *Albrecht von Haller. Über die Einheit im Denken des letzten Universalgelehrten* (Wiesbaden 1971) and Otto Sonntag, 'Albrecht von Haller on the Future of Science', *Journal of the History of Ideas* 35 (1974), 313–322.

> what cannot be discovered with the knife or the microscope, however, I have no desire to do much conjecturing; indeed, I gladly refrain from teaching what I do not know myself. It is pride born of ignorance to want to show others what one cannot see oneself.[8]

The list of similar quotes from Haller could easily be continued, reading like an echo of the preliminaries of Netwon's *Principa* and providing more than obvious evidence of Haller's understanding of science and his fascination with the term "force".[9] Natural phenomena could be observed and connected in terms of cause and effect—as in the case of anatomical structure and physiological function. But nevertheless it was not possible to draw conclusions about an underlying ultimate cause on the basis of all these many empirical findings. Although a reconciliation of scientific hypotheses and empirical findings was possible in the operational procedures of the empiricist, a theory that made an equation of cause and effect readable in both directions could not be formulated in Haller's view.[10] In this respect attention has been called to the remarkable fact that Haller, unlike his student Johann Georg Zimmermann, made no attempt at systematically theorising the practice of a physician as the "empirical science of medicine".[11] Haller accepted the working of forces as a process whose manifestations he could observe as a scientist but whose deeper logic he could not and should not penetrate. In this sense his criticism of the work of the French natural scientist Georges-Louis LeClerc, Comte de Buffon, and particularly Buffon's *Reflexions sur le système de la generation* (1751), harboured an appeal for restraint—an epoché—that was owed to the contingency of prevailing forces. Haller saw in Buffon's model an undermining of the self-moderation of the empiricist and of respect for the magnificence of creation; scientific hubris was at work if Buffon believed that with his concept of the process of becoming he had explained the order of nature in terms of temporal evolutionary logic. In order to sustain

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[8] Albrecht von Haller, 'Von den empfindlichen und reizbaren Theilen des menschlichen Körpers, den 22. April 1752 in der Kön. Ges. der W. zu Göttingen vorgelesen', *Hamburgisches Magazin, oder gesammlete Schriften, zum Unterricht und Vergnügen* 13 (1754), 227–259.

[9] See Simone de Angelis, *Von Newton zu Haller. Studien zum Naturbegriff zwischen Empirismus und deduktiver Methode in der Schweizer Frühaufklärung* (Tübingen 2003), 240.

[10] Sandra Pott identified the "stratagem" in Haller's method in the fact that he distinguished, according to the early modern tradition, between the operational level (formal and material causes) and the metaphysical level (final cause). Sandra Pott, *Säkularisierung der Wissenschaften in der Frühen Neuzeit* (Berlin and New York 2002), 2 vols., I: 118.

[11] Toellner 1971 (note 7), 212f.

this theory, the force at work in Buffon's system would have to be an agent endowed with reason, according to Haller, that continually and unfailingly aimed in the same direction contrary to the laws of random variation. This admonition was addressed to an entire generation of younger scholars whose primary aspiration was no longer to reconcile their scientific findings with belief in revelation but to investigate all remaining mysteries of nature. It should be noted briefly here that this criticism appeared to anticipate such auxiliary constructs in natural history as Kant's *intention of nature* [Naturabsicht] and Smith's *invisible hand*.[12]

At about the same time as Haller, the Scottish philosopher David Hume, who was only three years younger, formulated what appears at first glance to be a comparable scientific credo: self-restriction of the sciences to the experimental method, a retreat from metaphysical questions, and renewal of philosophy as an empirically based *science of man* which, in the form of an epistemology corroborated by inductive reasoning, was to serve as the only reliable basis for all other sciences. By contrast with Haller, however, Hume was not a professor who propagated this theory from the lectern of a university or European academy, but an academic exile who initially veiled his convictions in the anonymously published *Treatise of Human Nature* (1739/40) and only later made them public in considerably moderated form. The radicalism of his project, which was to deny him university employment throughout his life,[13] was expressed in the subtitle of his first work: "An ATTEMPT to introduce the experimental Method of Reasoning INTO MORAL SUBJECTS".[14] The substantial difference between Hume and Haller thus consisted in the fact that Hume did not see divine creation as the ultimate force behind the order of nature,

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[12] Heinz Dieter Kittsteiner elaborated the long underestimated significance of natural history metaphors in eighteenth-century texts for the development of modern philosophies of history already in his dissertation. See Heinz Dieter Kittsteiner, *Naturabsicht und unsichtbare Hand. Zur Kritik geschichtsphilosophischen Denkens* (Frankfurt/M., Berlin and Wien 1980).

[13] Stigmatisation as a heretic, which Hume had experienced since the appearance of the *Treatise*, proved to be stronger than the enterprising efforts of his friends in trying to secure a professorship for him: "I am inform'd, that such a popular Clamour has been raised against me in Edinburgh, on Account of Scepticism, Heterodoxy & other hard Names, which confound the ignorant, that my Friends find some Difficulty, in working out the Point of my Professorship, which once appeared so easy." David Hume to Matthew Sharpe of Hoddam 1744, in David Hume, *Letters*, ed. by J.Y.T. Greig (Oxford 1932), 2 vols., I: 59. For biographical details, see Ernest Campbell Mossner, *The Life of David Hume* (second edn., Oxford 1980), 153f.

[14] Emphases in the original. David Hume, *A Treatise of Human Nature*, ed. by L.A. Selby-Bigge (second edn., Oxford 1978), title page.

but instead proposed that precisely this presumption constituted a fundamental obstacle to the development of the sciences so far. According to Hume, the premise of an ultimate divine force had caused people to perceive on principle a constitutive connection between phenomena in the natural world—a fatality—which was at the least unverifiable and probably did not even exist. His critique was thus directed above all at metaphysics, the previous success of which, in his view, was less grounded in scientific investigation than focused on logical subtleties and rhetorical bluster. In order to redress this situation, it was necessary in Hume's eyes "to leave the tedious lingering method, which we have hitherto followed, and instead taking now and then a castle or village on the frontier, to march up directly to the capital or centre of these sciences, to human nature itself; which being once masters of, we may every where else hope for an easy victory".[15]

The military metaphor Hume used to describe his project was not lacking in inner logic, given that its author intended not only to launch certain reforms within the sciences but to install a radical new system, thereby arousing powerful opponents:

> From this station we may extend our conquests over all those sciences, which more intimately concern human life; ... There is no question of importance, whose decision is not compriz'd in the science of man; and there is none, which can be decided with any certainty, before we become acquainted with that science. In pretending therefore to explain the principles of human nature, we in effect propose a compleat system of the sciences, built on a foundation almost entirely new, and the only one upon which they can stand with any security.[16]

With this battle plan, Hume gave a change of direction to the scientific tradition that was then being newly established.[17] Experience and observation were now no longer to be used only in coming to grips with the phenomena of the physical world; they were to be applied to the moral

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[15] Ibid., XVI.

[16] Ibid.

[17] Reinhard Brandt considered Hume to have established "new moral sciences" [Geisteswissenschaften] with his *science of man*. See Reinhard Brandt, 'Einführung', in David Hume, *Ein Traktat über die menschliche Natur* (Hamburg 1989), vol. 1, XI. On the origin and development of the concept of "moral sciences" from David Hume to John Stuart Mill and the translation of his *System of Logic, Ratiocinative and Inductive* (1843) into German (*System der deduktiven und induktiven Logik*, 1863), see Hans-Georg Gadamer, *Wahrheit und Methode. Grundzüge einer philosophischen Hermeneutik* (sixth edn., Tübingen 1990), 2 vols., I: 9.

world as well.[18] Furthermore, the *science of man*, with its conclusions about nature and the cognitive faculty of human beings, was to constitute the foundation for all other sciences. The reason why a project of this sort—applying a method based on experience to moral philosophy—had not been undertaken long before could be found, as Hume explained it, in the history of science. After all, the necessary time interval between his project and that of his forerunners was the same as that between Thales and Socrates. As his forerunners Hume cited "Lord BACON and some late philosophers in *England*, who have begun to put the science of man on a new footing, and have engaged the attention, and excited the curiosity of the public".[19]

According to Hume, it was now time to bid a final farewell to the previous practice in moral philosophy of passing off hypotheses and assumptions as principles of the first order.[20] The *science of man* faced the same difficulty as all other sciences in establishing principles a priori, as no science could probe deeper than experience. The disadvantage of moral philosophy compared with other sciences, however, was the fact that it could not conduct its experiments intentionally as, for example, in physics. Experiments of intentional design undertaken on human beings must inevitably fail, as the intention would always influence the outcome. This was a problem that certainly contributed to the delayed acceptance of observation-based findings in this field. For this reason, the *science of man* would have to proceed with particular caution and choose its sources with care:

> We must therefore glean up our experiments in this science from a cautious observation of human life, and take them as they appear in the common course of the world, by man's behaviour in company, in affairs, and in their

[18] It has been emphasised that the central meaning of Hume's *Treatise* consists in this connection between "human science" and "natural science". Regarding the concept of the "Science of Man", Hobbes, Grotius and Pufendorf presented starting points, to which Hume, however, did not explicitly refer. See Christopher Fox, 'Introduction. How to Prepare a Noble Savage: The Spectacle of Human Science', in id. et al. 1995 (note 5), 2. On the particular Scottish contribution in the connection between "natural" and "moral" philosophy, see Richard Olson, *Scottish Philosophy and British Physics 1750–1880. A Study in the Foundation of the Victorian Scientific Style* (Princeton 1975), 12.

[19] With "some late philosophers in *England*" Hume was referring to "Mr. *Locke*, my Lord *Shaftesbury*, Dr. *Mandeville*, Mr. *Hutchinson*, Dr. *Butler*, &c." He moreover traced this successful Anglo-Saxon development of tradition to the tolerance and freedom that existed in that country. Hume 1978 (note 14), XVII.

[20] Hume's purpose here was "in avoiding that error, into which so many have fallen, of imposing their conjectures and hypotheses on the world for the most certain principles." Ibid., XVIII.

> pleasures. Where experiments of that kind are judiciously collected and compared, we may hope to establish on them a science, which will not be inferior in certainty, and will be much superior in utility to any other of human comprehension.[21]

In order to create a stable foundation for this most useful of all sciences, Hume developed his epistemology, which is important in the present context to the extent that it established the theoretical starting point and the methodological standards for the later natural historians of the Scottish Enlightenment.[22]

The distinctiveness of Hume's epistemology lay in the fact that not only impressions of phenomena, but also ideas about these phenomena were seen as deriving from sensory experience: "In short, all the materials of thinking are derived either from our outward or inward sentiment: the mixture and composition of these belongs alone to the mind and will. Or to express myself in a more philosophical language, all our ideas or more feeble perceptions are copies of our impressions or more lively ones."[23] Based on his epistemological finding that every "idea" was preceded by sensory experiences, Hume gave particular attention to these experiences, which he further classified as "sensations" and "reflections". While he left the study of the "sensations" to anatomists and natural philosophers, he was particularly interested in the "reflections" of the human mind. For, based on the correspondence of sensory experiences, which in turn triggered impressions of longing and aversion, hope and fear in the soul, it was the capacity of memory and the power of imagination that generated ideas. Against this background, it is understandable why the human capacity to recall impressions played a special role in Hume's epistemology.

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[21] Ibid., XIX.

[22] The present study is based on the hypothesis that the so-called Scottish Enlightenment received its decisive methodological impulses from Hume. Norbert Waszek has also emphasised this point: "On the road taken by the Scottish Enlightenment, Hume's *Treatise* is a milestone whose importance cannot be overestimated." Norbert Waszek, *L'Écosse des Lumières. Hume, Smith, Ferguson* (Paris 2003), 37.

[23] This statement has been characterised as the "main theorem of empiricism", which received its classic formulation in the moderated and revised edition of the *Treatise*, appearing in 1748 as *Enquiry Concerning Human Understanding*. David Hume, *Enquiries Concerning Human Understanding and Concerning the Principles of Morals*, ed. by P.H. Nidditch (16th edn., Oxford 1997), 19. After the *Treatise*, to Hume's great disappointment, "fell *dead-born from the press*", he wanted the *Enquiry* alone to be regarded as the presentation of his philosophical views and principles. David Hume, 'My Own Life', in id., *Essays, Moral, Political, and Literary*, ed. by T.H. Green and T.H. Grose (London 1875), vol. 1, 2. From today's perspective, however, the *Treatise* appears to be the more detailed and bolder work in dealing with the boundaries of knowledge.

"Memory" served not primarily to retain individual ideas but rather to order them and classify them systematically.[24] This point brings us to the core of Hume's intellectual framework, which is supported by the conviction that external order exists independently of our perception and that its actual connections cannot be understood. According to Hume, these connections are "made" intentionally by the individual in order to comprehend and understand the world. The greater degree of scepticism expressed by comparison with his predecessors about what can really be known, and his recourse to the fragile sheet anchor of extremely uncertain sensory experience, make clear why David Hume is considered the founder of modern scepticism and simultaneously of empiricism—and also why tension arises between these two positions.[25] A sceptical attitude about judgments of any sort is necessary in Hume's system in order to establish observation-based knowledge as a problematic, but nonetheless the only effective form of knowledge.[26] Only insight into the limits of knowledge and human reasoning as a construct could distinguish knowledge from belief and protect science from systems of belief that were passed off as principles of primary validity in the scientific tradition that had been predominant up to that point.

The principal concern of Hume's subsequent explications was to abandon the notion of a necessary or metaphysical link between observed connections and to remain aware of their being "made" (constructed). This applied in particular measure to the connection between past and future, i.e. the question of whether we can expect phenomena observed in the past to occur in the future[27]—an apparently necessary prerequisite for the epistemic value of empirical studies. Hume's answer was that this connection can be described only in categories of probability and

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[24] "An historian may, perhaps for the more convenient carrying on his narration, relate an event before another, to which it was in fact posterior; but then he takes notice of this disorder, if he be exact; and by that means replaces the idea in its due position." Hume 1978 (note 14), 9.

[25] Hume was regarded for a long time primarily as a sceptic in the Anglo-Saxon world. While the perception of Hume as a sceptic critical of religion was also dominant in Germany until well into the second half of the eighteenth century, it was Kant who was responsible for labelling Hume as an "empiricist"—the label that later became dominant. Hans-Jürgen Engfer, *Empirismus versus Rationalismus? Kritik eines philosophiegeschichtlichen Schemas* (Paderborn 1996), 312f.

[26] On Hume's sceptical position and its contemporary context, see Heiner F. Klemme, 'Scepticism and common sense', in Alexander Broadie (ed.), *The Cambridge Companion to the Scottish Enlightenment* (Cambridge 2003), 118.

[27] Hume 1978 (note 14), 134.

possibility, and thus on the basis of the similarity of phenomena.[28] Moreover, here too Hume pointed out that similarities can be deceptive and that a fortiori no inner connection between observed phenomena can exist beyond experience.[29] Transferring experience from the past to the future was not a necessity but a human habit. This was particularly problematic with regard to the connection between cause and effect. Hume made an effort to strip the cause-effect connection of any metaphysical link suggesting a covert force or energy behind it.[30] The only recognisable force behind the necessary connection between cause and effect was the habit of the observer.[31] Regular occurrence of phenomena in the roles of cause and effect generated belief in a universal law or a metaphysical force behind them. Hume's solution to the dilemma of having to adopt a radically sceptical position based on these considerations was a moderately sceptical stance, as presented, for example, in the *Enquiry Concerning Human Understanding*: "There is indeed, a more *mitigated* scepticism or *academical* philosophy, which may be both durable and useful, and which may, in part, be the result of this Pyrrhonism, or *excessive* scepticism, when its undistinguished doubts are, in some measure, corrected by common sense and reflection."[32] The intention here was to tame, on the one hand, dogmatic philosophers whose rigidified points of view would be more moderate, more useful and less arrogant if they were aware of the notable weaknesses of the human mind and, on the other hand, the human inclination towards high-flying metaphysical theories. Epoché—the self-restriction of science to such objects as are appropriate to the limited capacities of the human mind—was Hume's epistemic desideratum.[33] In making judgments, the scientist must always account for the limits of the human mind's capacities and their constructive character and systematically make a method of analysing them.[34] Hume's mitigated scepticism

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[28] Ibid., 137.

[29] "That there is nothing in any object, consider'd in itself, which can afford us a reason for drawing a conclusion beyond it; and, That even after the observation of the frequent or constant conjunction of objects, we have no reason to draw any inference concerning any object beyond those of which we have had experience . . ." Ibid., 139.

[30] Ibid., 158.

[31] "Upon the whole, necessity is something, that exists in the mind, not in the objects . . ." Ibid., 165. Annette C. Baier, *A Progress of Sentiments. Reflections on Hume's Treatise* (Harvard 1994), 70f.

[32] Hume 1997 (note 23), 161.

[33] Ibid., 162.

[34] "It may perhaps be esteemed an endless task to enumerate all those qualities which may objects admit of comparison, and by which the ideas of *philosophical* relation are produced." Hume 1978 (note 14), 14.

consequently became a necessary prerequisite for the development of a scientific methodology.[35]

Hume claimed that connections between ideas took three definitive forms: "RESEMBLANCE, CONTIGUITY in time or place, and CAUSE and EFFECT".[36] Consequently, comparison, analogy and establishing cause-effect relationships were the standard methods to which the *scientist of man* should be devoted. By contrast with physics or anatomy, however, experiments in the *science of man* could not be conducted intentionally. As appropriate source material for study Hume therefore recommended travel journals describing "savage" peoples and historical accounts, as these provided information on different stages of "man" as the object to be studied. History, in particular, offered a reservoir of case studies which could take on the function that experiments had in the natural sciences.[37] History, in accordance with its traditional function in the scientific framework of the early modern period, provided a databank for the *science of man* in the form of *historia naturalis* and *historia humana*.[38] The methodological prerequisite for comparison of simultaneously existing or historical peoples was, however, a premise which made basic comparison possible, i.e. which underpinned the idea of the anthropological equality of historical and contemporary peoples. Important in this context was the idea of the "uniformity of human nature", which needed to be accepted in order to ensure the universality of research results. Hume had no doubt about this axiom deeply embedded in natural law: "It is universally acknowledged that there is a great uniformity among the actions of men, in all nations and ages, and that human nature remains still the same, in its principles and operations. The same motives always produce the same actions."[39]

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[35] See Andreas Urs Sommer, 'Historischer Pyrrhonismus und die Entstehung der spekulativ-universalistischen Geschichtsphilosophie', in Carlos Spoerhase (ed.), *Unsicheres Wissen: Skeptizismus und Wahrscheinlichkeit 1550–1850* (Berlin and New York 2009), 201f.

[36] Hume 1978 (note 14), 11.

[37] "These records of wars, intrigues, factions, and revolutions, are so many collections of experiments, by which the politician or moral philosopher fixes the principles of his science, in the same manner as the physician or natural philosopher becomes acquainted with the nature of plants, minerals, and other external objects, by the experiments which he forms concerning them." Hume 1997 (note 23), 83f.

[38] In principle, "historia" and the circumstances of what was only later labelled as "empiricism" were used synonymously in the early modern period. See Arno Seifert, *Cognitio Historica. Die Geschichte als Namengeberin der frühneuzeitlichen Empirie* (Berlin 1976).

[39] David Hume, *Enquiry Concerning Human Understanding and Concerning the Principles of Morals*, ed. by P.H. Nidditch (third edn., Oxford 1989), 83. The assumption of "one" human nature is firmly anchored in the philosophy of natural law. It served above all as the foundation of equality before the law but also as an important basis for egalitarian

This use of history made clear where Hume's real epistemological interest lay. The inductive method was no longer to be applied only to questions in natural philosophy but also to the study of the motives for human action. If regularities in the *conditio humana* could be identified, it should then be possible to establish a moral philosophy with an empirical basis. The universal principles that would come from this science were consequently not to be found in the historical process but in human nature. Hume intended to use scientifically validated knowledge about human motives to gain knowledge about the overarching structures of the human species, as he had done for the phenomenon of belief in his *Natural History of Religion*.[40] History itself remained a realm that could not be comprehended scientifically, whose laws could not be deciphered. The use of history for Hume lay in the tradition of *historia-magistra-vitae* and, of course, in entertainment, which he so impressively demonstrated as an exceptionally successful writer of history.[41]

From Natural History to the Natural History of Mankind: Ferguson

In developing his concept of the *science of man*, Hume focused his attention primarily on questions of epistemology. This left the task of further development of the operational level of *natural history* to Hume's combatants among the Scottish scholars and to the subsequent generation. An additional important building block for the concrete development of *natural history* was the reception of Jean Jacques Rousseau's theory of perfectibility, which Hume had rejected and which appeared to contradict

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thinking in social theory in the conceptualisation of "civil society". At the same time, however, the uniformity of human nature taken as a fact must be distinguished from the methodological premise of "de iure" equal subjects under the law, as in Hobbes' social contract. Otto Dann, 'Einleitung', in id. and Diethelm Klippel (eds.), *Naturrecht, Spätaufklärung, Revolution* (Hamburg 1995), 1.

[40] Hume's term "natural history" was traced in particular to his work on the natural history of religion with the same title. David Hume, 'The Natural History of Religion', in id. 1875 (note 23), 307–363. For Dugald Stewart, an advocate of the Scottish Enlightenment, Hume's 'Natural History of Religion' even set the style for a new historiographical genre which he labelled "Conjectural History": "… [A]n expression which coincides pretty nearly in its meaning with that of Natural History, as employed by Mr. Hume [*see his Natural History of Religion] …" Dugald Stewart, 'An Account of the Life and Writings of the Author', in Adam Smith, *Essays on Philosophical Subjects* (Basil 1799), XLVII.

[41] On Hume's understanding of history, see Annette Meyer, *Von der Wahrheit zur Wahrscheinlichkeit. Die Wissenschaft vom Menschen in der schottischen und deutschen Aufklärung* (Tübingen 2008), 102f.

the theory of the uniformity of human nature, as it assumed that human beings had a natural capacity for perfection. Rousseau's "idea of perfectibility" hit the academic world like a bang and became an object of both criticism and admiration. In any event, dealing with Rousseau's theory of the perfectibility and depravity of mankind was a frequent starting point for considerations of human history, and *perfectibilité* entered the English and German languages as a borrowed word.[42]

Rousseau's *Sur l'origine et les fondemens de l'inégalité parmi les hommes*, published in 1755, was the subject of a critical review in the *Edinburgh Review* by the young Scottish professor of moral philosophy Adam Smith, who believed that the large-scale project of an *Histoire Naturelle* proposed by the French scholar Buffon and his colleague Daubenton was superior to Rousseau's theories.[43] Whereas Smith expressed doubts about the juxtaposition of the halcyon state of nature and the concept of development inclining towards depravity, which in his eyes was the product of a certain amount of gimmickry, he found the many precise observations and experiments in Buffon's theory of development to be convincing.[44] He shared this assessment with his colleagues Henry Home, Lord Kames; James Burnett, Lord Monboddo; and Adam Ferguson, for all of whom Buffon's *Histoire Naturelle* offered an inexhaustible reservoir of natural histories and was an important impetus for explanation of the development of humankind. In his extraordinarily successful textbook *Institutes of Moral Philosophy*, published in 1769, Adam Ferguson even decidedly followed Buffon's concept of natural history,[45] combining Hume's *science of man* and Buffon's *Histoire Naturelle* into a *natural history of mankind*: "These

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[42] See Gottfried Hornig, 'Perfektibilität', *Archiv für Begriffsgeschichte* 24 (1980), 226. On the reception of the French Enlightenment in Scotland, see the cursory overview by John H. Brumfitt, 'Scotland and the French Enlightenment', in William H. Barber, John H. Brumfitt and Ralph A. Leigh (eds.), *The Age of the Enlightenment* (Edinburgh and London 1967), 323. On the German equivalent "Vervollkommnung", see Reinhart Koselleck, 'Fortschritt', in Otto Brunner, Werner Conze and Reinhart Koselleck (eds.), *Geschichtliche Grundbegriffe* (Stuttgart 1979), 8 vols., II: 379.

[43] Buffon's *Histoire Naturelle* ranked before Carl von Linnés *Systema Natura* (1735) and Albrecht von Haller's *Elementa physiologiae* (1757–1766) as the most frequently purchased compendium in the University Library of Edinburgh in the period 1762–1792. See MS. Da. 1. 46. (EUL), unpaginated.

[44] On the significance of Buffon's concept of development for proto-evolutionary historical thought in the Enlightenment, see Peter Hanns Reill, *Vitalizing Nature in the Enlightenment* (Berkeley, Los Angeles and London 2005).

[45] Adam Ferguson, *Institutes of Moral Philosophy. For the Use of the Students in the College of Edinburgh* (second edn., Edinburgh and London 1773), 15. See also Henry Home, Lord Kames, *Sketches on the History of Man* (second edn., Edinburgh and London 1778), 4 vols., I: 5.

institutes contain heads from which lectures are given, which comprise masterly reflections on the history of mankind, and an instructive analysis of the human mind," read an exceptionally laudatory review of the second edition of the *Institutes* in the *Edinburgh Magazine and Review*.[46] This resulted in a clear dissolution of the boundaries of the project as Hume had originally conceived it. The human being as an isolated phenomenon in the experimental arena of history seemed to Ferguson to be chimerical. He came instead to the conclusion that human beings follow their progressive nature, which is the expression of their unchanging essence. They generate the laws of the system of humanity through their ambition to achieve progress: "The bulk of mankind are, like other parts of the system, subjected to the laws of their nature, and without knowing it, are led to accomplish its purpose."[47] Human development, without being aware of it, was pursuing its goal—the advance of mankind, or humanity. Ferguson was one of the earliest theorists to see the concept of mankind as determined by a blend of the normative (humanity) and the phylogenetic (species), as analysed by Hans Erich Bödeker in a conceptual study.[48] Ferguson's stratagem as a natural historian consisted in recognising the principle of human development in the nature of mankind. Hence mankind is both the subject and the object of human history. The progress of the species, for which Ferguson adopted the term "civilisation" for the English-speaking world,[49] was not intended by the will of the individual human being; rather, the processes of human history were alike by virtue of the uniformity of human motives—their *unintended consequences*.[50] In this sense Ferguson remained true to the *spiritus rector* of the *science of man*, David Hume, who was unwilling to recognise inevitable necessity at work in the progress of the species. Humans, by contrast with plants and animals, owing to their free will were in a position to influence the process themselves, although there was a constant risk of this process taking a circular course. This idea explains why Ferguson, like

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[46] *The Edinburgh Magazine and Review* 1 (1773/74), 103.

[47] Adam Ferguson, *Principles of Moral and Political Science; Being Chiefly a Retrospect of Lectures Delivered in the College of Edinburgh* (Edinburgh 1792), 2 vols., I: 201.

[48] Hans Erich Bödeker, 'Menschheit, Humanität, Humanismus', in Brunner, Conze and Koselleck 1979 (note 42), III: 1063–1128.

[49] See Jean Starobinski, 'Das Wort Zivilisation', in id., *Das Rettende in der Gefahr. Kunstgriffe der Aufklärung* (Frankfurt/M. 1990), 9–64.

[50] For the "theory of unintended consequences" in the Scottish Enlightenment, see Ronald Hamowy, *The Scottish Enlightenment and the Theory of Spontaneous Order* (Carbondale 1987), 7f.

his model Montesquieu and many other historians of the eighteenth century, were so intensely preoccupied with the history of the fall of Rome,[51] which appeared to constitute an experimental situation that illustrated the historical fallacy of applying a linear model of development to human history.

Crossing the Threshold to the Laboratory of History: Millar and Buchan

John Millar, a young professor of law in Glasgow and a student of Adam Smith, was less cautious when it came to the laboratory of history. In his *Origin of the Distinction of Ranks*, Millar sought to examine neither human nature nor the motives for human action. He focused instead on the historical causes of political and social change themselves. Research into these causes would make it possible to deduce legal norms that could stabilise society and thereby to have an effect on the moral status of the members of society.[52] By contrast with his predecessors, Millar had greater faith in contemporary natural philosophy and in the possibility of knowing "historical truths"; but if this possibility was to be successfully realised and go beyond hypothetical assumptions, it would be necessary in methodological terms to follow precisely the inductive procedures of natural philosophy.[53] According to Millar, the error in reasoning in Rousseau's model of depravity lay in his view of the spirit of freedom as the natural disposition of human beings which diminished successively as civilisation progressed. Millar contested this romantic ideal of mankind's natural state citing the lack of historical evidence to support it. In his view it was only with the advent of private property that a social hierarchy developed, and it was from the structure of subordination inherent to hierarchy that the striving for liberty first emerged.[54] Only a study of historical circumstances could

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[51] Iain McDaniel, 'Ferguson, Roman History and the Threat of Military Government in Modern Europe', in Eugene Heath and Vincenzo Merolle (eds.), *Adam Ferguson: History, Progress and Human Nature* (London 2008), 118f.

[52] John Millar, *The Origin of the Distinction of Ranks. An Inquiry into the Circumstances Which Gave Rise to the Influence and Authority in the Different Members of Society* (fourth edn., Edinburgh 1806), 4.

[53] Millar mentions Newton, Locke, Hume and Smith as his models in English philosophy. John Millar, 'Letter I to the Editor of the Scots Chronicle 1796', in id., *The Letters of Crito e Letters of Sidney*, ed. by Vincenzo Merolle (Rome 1984), 45.

[54] "Where ever men of inferior condition are enabled to live in affluence by their own industry, and in procuring their livelihood, have little occasion to court the favour of their

explain the development of inequality and thus the reasons for suppression of the idea of freedom.[55] Millar's ideas were consequently concerned neither with mankind's natural state nor with detailed anthropological foundations but with the development of society itself. This makes it clear that Millar, by contrast with Ferguson, was writing not as a moral philosopher but as a legal historian.[56] It was not timeless norms of action that were to be deduced from history but the causes of political and social change, in order to be able to formulate legal norms to stabilise society which would in turn have an effect on human beings. The goal of "civil liberty" for him was not the moral conduct of the citizen within the "polis", as it was for Ferguson, but the sovereign legal status of equal citizens. "Commercial society" thus offered a chance, through the possibility of independent gainful employment, to abolish social inequality and create the basis for equality among citizens.[57] The idea of the "natural progress of mankind" arose with Millar—as it did with Ferguson—from a combination of the theory of perfectibility with the assumption that human nature remained constant.[58] A clear dissolution of the boundaries of this model came about, however, to the extent that Millar linked "perfectibility" and "uniformity" with the process of history itself: "There is, however, in man a disposition and capacity for improving his condition, by the exertion of which, he is carried on from one degree of advancement to another; and

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superiors, there we may expect that the ideas of liberty will be universally diffused." Millar 1806 (note 52), 241f.

[55] In addition to legal questions, John Millar was also interested in the political issues of his time. By contrast with Adam Ferguson, he was among those who favoured the struggle for independence in the American colonies, and he remained a convinced believer in the French Revolution even after the beheading of King Louis XVI: "In the proportion as the French Revolution was grateful to those who rejoiced in the extension of political liberty, it gave rise to the unpleasant sensations in the absolute sovereigns of Europe. Their authority was obviously founded on opinion; and that opinion rested on old custom and prejudice. If the people should once be led to *think* upon the subject of government, they must immediately see the absurdity of sacrificing their lives, and everything they hold valuable, to the private interest, to the avarice and ambition, to the whim and caprice of a single individual. They must immediately see that government is intended, by the wise and good Author of nature, for the benefit of the whole community; and that every power, inconsistent with this great principle, assumed by any person, king, or emperor, is manifestly unjust and tyrannical." John Millar, 'Letters II–XV to the Editor of the Scots Chronicle 1796', in id. 1984 (note 53), 52f.

[56] The writings of Lord Kames were a model for Millar and for his teacher, Adam Smith, in terms of legal theory applied to human history. See Peter Stein, 'Law and Society in Eighteenth-Century Scottish Thought', in Nicholas Phillipson and Rosalind Mitchison (eds.), *Scotland in the Age of Improvement* (Edinburgh 1970), 159.

[57] Millar 1806 (note 52), 295.

[58] Ibid., 4.

the similarity of his wants, as well as of the faculties by which those wants are supplied, has every where produced a remarkable uniformity in the several steps of his progression."[59] This step of applying anthropological constants to the development of society illustrates the transition from the *science of man* to a *natural history of mankind*.[60] It was a step from the primacy of anthropology to the study of the social and the historical from an anthropological perspective, to which Hume had denied an independent epistemic value and the claim to scientificity. The development of mankind according to John Millar, by contrast, was understood as a substantial process of emancipation in the direction of a mature civil society that afforded the ideal expression of human existence. Self-preservation as a basic principle of unchanging human nature and perfectibility were combined into one as a basis for the study of mankind.[61] It was precisely in the preoccupation with the natural history of mankind in its different states—from "rude" to "refined"—that progress in reason appeared to manifest itself, both in individuals and in the progress of human history. This at least was the conviction of a prominent student of Smith and Millar, David Steuart Erskine, Earl of Buchan:[62]

> Nor is the change in the condition of man, in consequence to the progress of reason, by any means contrary to the general analogy of his natural history. In the infancy of the individual, his existence is preserved by instincts, which disappear afterwards, when they are no longer necessary. In the savage state of our species, there are instincts which seem to form a part of the human constitution, and of which no traces remain in those periods of society in which their use is superseded by a more enlarged experience.[63]

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[59] Ibid., 2f.

[60] "The following Inquiry is intended to illustrate the natural history of mankind in several important articles. This is attempted, by pointing out the more obvious and common improvements which gradually arise in the state of society, and by showing the influence of these upon the manners, the laws, and the government of a people". Ibid., 11. Use of the terms "Natural History of Mankind" (Ferguson, Millar) and "History of Mankind" (Lord Kames, James Dunbar) increased noticeably in the second half of the eighteenth century; they can be interpreted as a clear expression of the expansion of the older anthropological concepts of "Science of Man" (Hume) or "Observations on Man" (David Hartley).

[61] Günther Buck, 'Selbsterhaltung und Historizität', in Hans Ebeling (ed.), *Subjektivität und Selbsterhaltung. Beiträge zur Diagnose der Moderne* (Frankfurt/M. 1996), 217.

[62] Emma Vincent Macleod, 'Erskine, David Steuart, eleventh earl of Buchan (1742–1829)', *Oxford Dictionary of National Biography* (Oxford 2004), vol. XVII, 524–526.

[63] David Steuart Erskine, Earl of Buchan presented these thoughts regarding his hopes "of the progress of the human race" under the pen name Albanicus in a book review in 1792. Erskine, a Scottish nobleman who had studied under Millar in Glasgow, counted himself among the supporters of the French Revolution prior to 1791 and advocated democratic election of Scottish representatives in the British Parliament. His open optimism

Based on these considerations, there arose for Buchan the further question of whether similar development in the future might not be hoped for in the political and social order as well: "Why then should we deny the probability of something similar to this in the history of man, considered in his political capacity?"[64] Knowledge of the emancipation of the independent subject from natural constraints might hold out the prospect of the same emancipation for the political order, thus opening a perspective on a future that could be freely determined.[65] The possibility of shaping future development freely would nevertheless have to be based on knowledge of the laws of nature, which could affect human motives and, in the eyes of some theorists, now also the course of society itself.[66] This consti-

about progress was shared by few of his academic colleagues; yet it marked a tenor found in many popular articles of the late Scottish Enlightenment. [Anonymous], 'On [Dugald] Stuart's Elements [of the Philosophy of the Human Mind, Edinburgh, 3 vols., 1792–1827]', *The Bee, or a Literary Weekly Intelligencer* 10 (1792), 145. On identification of the name behind the pseudonym, see William Cushing (ed.), *Initials and Pseudonyms. A Dictionary of Literary Disguise* (London 1886), 8. Ian Simpson Ross describes Buchan, as "fearless in thought and deed to an extent that was outright eccentric." Ian Simpson Ross, *Adam Smith. Leben und Werk* (Düsseldorf 1998), 209.

[64] Buchan 1792 (note 63), 145.

[65] Adam Ferguson interpreted the apparent imperfection of human nature as a driving force that would validate his determination of possible perfection through the history of mankind: "That the birth of a man is more painful and hazardous; that the state of his infancy is more helpless, and of longer duration, than is exemplified in the case of any other species, may be ranked with the apparent comparative defects of his animal nature: But this circumstance, we may venture to affirm, like many others of his seeming defects, is of a peace with that superior destination, which remains to be fulfilled in the subsequent history of mankind." Ferguson 1792 (note 47), I: 28. This passage clearly shows the separation between the categories of "experience" and "expectation", described by Reinhart Koselleck as essential for the development of historical thought. Understanding of past and present and the opening of a changed perspective on the future were to blend into a coherent development process—the "history of mankind". Reinhart Koselleck, *Vergangene Zukunft. Zur Semantik geschichtlicher Zeiten* (second edn., Frankfurt 1992), 362f.

[66] Buchan here again takes a very pronounced position: "... [A]nd therefore what we commonly call political order, is, at least in a great measure, the result of the passions and wants of man, combined with the circumstances of his situation, or, in other words, it is chiefly the result of the wisdom of nature. So beautifully, indeed, do these passions and circumstances act in subserviency to her designs; and so invariable have they been found, in the history of past ages, to conduct men, in time, to certain beneficial arrangements, that we can hardly bring ourselves to believe that the end is not foreseen by those who were engaged in the pursuit. Even in those rude periods of society, when, like the lower animal, he follows blindly his instinctive principles of action, he is led by an invisible hand, and contributes his share to the execution of a plan, of the nature and advantages of which he has no conception ..." Buchan 1792 (note 63), 145f. Buchan's use of the term "invisible hand" is a clear reference to Adam Smith, whom he acknowledges as his mentor at the beginning of the article. Buchan describes himself as the "subject of historian ages" in the context of the changes that had occurred in philosophy over the previous 40 years. Buchan 1792 (note 63), 141. See Kittsteiner 1980 (note 12), 34f.

tuted a shift of interest from the *science of man* to the *natural history of mankind*, where fresh ground was broken in particular among the younger generation of Scottish Enlightenment thinkers and in the popular editions of their writings.[67]

The stratagem of applying anthropological constants to the historical process itself gave rise to a new scientific object: history. History, accordingly, did not consist of ephemeral, contingent events but was instead a realm of scientific research. The unchanging internal laws of uniformity and perfectibility recognised in this approach created the coordinates of a predictable space-time continuum that could be explored with the help of experiments. "Savage" peoples could serve as the objects of experiment and be compared with pre-modern peoples, drawing parallels by analogy and thereby substituting the missing pieces in the background to natural history. Consequently, the methods of comparison and conclusion by analogy, borrowed from mathematics and recommended by Hume for deconstructive use, made it possible not only to explain respective unevenness of development in the progress of the species but were also appropriate for interpreting this unevenness as a tribute to being more or less well equipped to fulfil the destiny of mankind. The coupling of temporal structure with cause-effect relationship appeared to make it possible as well to project potential further developments in the future. Natural history in the late Scottish Enlightenment no longer served the study of human nature as Hume had conceived it in his *science of man*. The central focus of interest was now the development of mankind, which was condensed into a complex theory of history in which "intention of nature"[68] or an "invisible hand"[69] replaced "divine force". In the course of the continuing

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[67] A popular version followed, for example, in the successful compilation published by John Adams, *Curious Thoughts in the History of Man; Chiefly Abridged and Selected from the Celebrated Works from Lord Kaimes, Lord Monboddo, Dr Dunbar, and the Immortal Montesquieu: Replete with Useful and Entertainment Instruction, on a Variety of Important and Popular Subjects. Designed to Promote a Spirit of Enquiry in the British Youth of Both Sexes. And to Make the Philosophy as well as the History of the Human Species, Familiar to Ordinary Capacities* (London 1789).

[68] "Intention of nature" [Naturabsicht] was used by Kant to denote the "history of nature" as determined by God, which found its expression in the natural predisposition of the individual. Kant's argumentation followed the same lines as the discourse of his contemporaries when he interpreted the increasing "use of reason" not as a component of individual development but as a project of the species. See Immanuel Kant, 'Idee zu einer allgemeinen Geschichte in weltbürgerlicher Absicht', in id., *Werke in sechs Bänden*, ed. by W. Weischedel (Darmstadt 1998), vol. 6, A 387, 388 and 389.

[69] The term "invisible hand" appears in different places in Adam Smith's writings and, with reference to the individual, is used as an expression of the "theory of unintended

development of the concept of natural history, the methodological stratagems and epistemologically guiding theories had themselves slowly become the ontological determinants of the process. This was a fear that had moved Haller and Hume, based on very different motivations, to restrict themselves with regard to methodology.

It is not without irony that the guardian of the pantheon of empiricism, Henry Thomas Buckle, expressed his reverence for the scholarship and the methods of Albrecht von Haller, whereas he characterised the Scottish scholars as typical representatives of unreflecting deduction: "... they regarded such inductions as unimportant in themselves, and as only valuable in so far as they supplied the premisses for another and deductive investigation." On this basis it was not difficult for Buckle in *The History of Civilisation*—a book not lacking in opinions—to distinguish two types of scholars: "The inductive philosopher is naturally cautious, patient and somewhat creeping; while the deductive philosopher is more remarkable for boldness, dexterity and often rashness".[70] In the reconstruction of scholars in action, and particularly when it comes to Albrecht von Haller, we will leave it at the qualities "cautious and patient".

consequences". Adam Smith, 'An Inquiry into the Nature and Causes of the Wealth of the Nations', in *The Glasgow Edition of the Works and Correspondence of Adam Smith* (Oxford 1976), 6 vols., II: 456. With respect to the species, Smith uses the term as a metaphor for contingent universal laws in natural history. Adam Smith, 'The History of Astronomy', ibid., III: 49.

[70] Henry Thomas Buckle, *Introduction to the History of Civilization in England* (*1857–61*), ed. by J.M. Robertson (London and New York 1904), 798.

PART SIX

ADVISING AND SERVING: THE FUNCTION OF THE EXPERT

THE SCHOLAR AND THE COMMONWEAL: CHRISTIAN WOLFF, ALBRECHT VON HALLER AND THE ECONOMIC ENLIGHTENMENT

Holger Böning

> As far as this brief essay is concerned, my intention is to shed light on agriculture and horticulture in order to encourage others to engage in useful observation of Nature . . . My hope in doing this is to begin to bring agriculture and horticulture into the realm of science.
>
> —Christian Wolff, 1718[1]

> Regard the inventor of a better plough as a benefactor of the kingdom; he who teaches you to cut more sheaves on an acre to be your brother. Prefer a well-tended field to any pleasure garden; consider a wheat stalk to be lovelier than a Mogori flower. All advantage stems from the contribution to the common good.
>
> —Albrecht von Haller, 1771[2]

Introductory Observations on the First Appearance of a New Self-Image among Scholars

> Happy is he in the eyes of all/who understands well the origin of things.
>
> —*Relationes Curiosae*, 1683[3]

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[1] Translated from Christian Wolff, *Entdeckung der Wahren Ursache von der wunderbahren Vermehrung Des Getreydes. Erläuterung*; Gottlob Christian Happe, *Der in seiner eigenen gemachten Gruben sich selbst fangende Wolff,* with an epilogue by Holger Böning (reprint of Halle 1718, 1719 and Berlin 1719 edns., Stuttgart-Bad Cannstatt 1993); unpaginated preface, 12*.

[2] Albrecht von Haller, *Usong. Eine Morgenländische Geschichte, in vier Büchern. Durch den Verfasser des Versuches Schweizerischer Gedichte* (Bern 1771). Translated from the Reutlingen edition of 1783, 300 (the first edition had "implement" rather than "plough" on 404); see Martin Stuber, '"Ein Waizenhalm schöner als die Blume Mogori"', *Unipress, Themenheft zu Albrecht von Haller* 135 (2007), 12–13.

[3] *Relationes Curiosae*, ed. by E(berhard) G(uernerus) Happelius [Eberhard Werner Happel], first as a weekly supplement to the *Hamburger Zeitung*, "Relations Courier" (Hamburg 1682–1691), vols. 1–5. The quotation can be found in vol. 1 (1683), preface. For the full title of this remarkable first universal scientific journal in Germany, and further detailed information about circulation, new editions, imitators, translations and locations,

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Favouring the wheat stalk over the pleasant-smelling jasmine and preferring a well-tended field to any pleasure garden are characteristic examples of the thinking of a new breed of scholars who first appeared during the early Enlightenment and were responsible for the increasingly practical and social orientation of the natural sciences. These scholars saw contributions to the common good as the source of all advantage and renown.[4] Christian Wolff pointed out in the year 1718 that the "academies of sciences" had hitherto been concerned only with "mathematics and astronomy and with a general knowledge of nature and medicine." The philosopher noted that they pursued these fields "for the most part with great understanding," but he went on to observe, "I wonder why people do not envisage academies where more effort is made to pursue truths that can contribute something to the commonweal of mankind."[5]

Half a century later the poet and natural scientist Albrecht von Haller expressed in his own way these precepts of a new self-image of scholars, which had for the first time been formulated with such conciseness by Christian Wolff, and which expressly conceived of the contributions of scholars to agricultural production and improvement of the daily lives of human beings as an important benefit of scientific endeavour.[6] He "who teaches you to cut more sheaves on an acre," wrote the Bernese scholar in his utopian novel *Usong*, "is your brother."[7]

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see Holger Böning (ed.), *Deutsche Presse. Bibliographische Handbücher zur Geschichte der deutschsprachigen periodischen Presse von den Anfängen bis 1815*, vols. 1.1, 1.2, 1.3: *Hamburg*, ed. by Holger Böning and Emmy Moepps (Stuttgart-Bad Cannstatt 1996), vol. 1.1, 42. On the newspaper, see Uta Egenhoff, *Berufsschriftstellertum und Journalismus in der Frühen Neuzeit. Eberhard Werner Happels "Relationes Curiosae" im Medienverbund des 17. Jahrhunderts* (Bremen 2008).

[4] Haller 1771 (note 2), 300.

[5] Wolff 1718 (note 1), 10*. The most important information about the quoted text can be found here. On Wolff and the basic literature, see also Klaus-Gert Lutterbeck, *Staat und Gesellschaft bei Christian Thomasius und Christian Wolff. Eine historische Untersuchung in systematischer Absicht* (Stuttgart-Bad Cannstatt 2002).

[6] Among the older works on Haller's role as a pioneer in incorporating scientific knowledge in the practice of agriculture, see Felix Anderegg, *Dr. Albrecht v. Hallers Bedeutung für die schweizerische Landwirtschaft* (Bern 1903); Conrad Bäschlin, *Die Blütezeit der Oekonomischen Gesellschaft in Bern 1759–1766* (Laupen 1913); Kurt Guggisberg, 'Albrecht von Haller und die Oekonomische Gesellschaft von Bern', *Tätigkeitsbericht der Oekonomischen und Gemeinnützigen Gesellschaft des Kantons Bern für das Jahr 1957*, 2–17; Silvio Martini, 'Albrecht von Haller (1708–1777) als Förderer der Forstwirtschaft und der Landwirtschaft in der Schweiz', *Schweizerische Landwirtschaftliche Monatshefte* 44 (1966), 321–327, and Hermann Wahlen, 'Albrecht von Haller und die Oekonomische Gesellschaft zu Bern', *Tätigkeitsbericht der Oekonomischen und Gemeinnützigen Gesellschaft des Kantons Bern für das Jahr 1977*, 3–9.

[7] Haller 1771 (note 2).

Before looking more closely at Christian Wolff and Albrecht von Haller, a brief excursus to examine the historical background of this new type of thought and activity will be expedient. The idea of transmitting scientific knowledge to non-scientists did not arise for the first time in the century of the Enlightenment. One example from the seventeenth century was the first German-language popular scientific magazine, *Relationes Curiosae*—known to contemporaries by its German title, *Grösste Denkwürdigkeiten der Welt*—published as of 1681.[8]

Seven years before the appearance of Thomasius's *Monaths-Gespräche*,[9] this amazing weekly journal was initially addressed to newspaper readers, appearing in the beginning as a supplement to the *Relations-Courier* issued by the Hamburg publisher Thomas von Wiering.[10] After it had found a good reception in the Hanseatic City, its enterprising publisher also distributed it independently throughout German-speaking Europe, making it one of the greatest magazine success stories of the seventeenth century.

The *Relationes Curiosae* was expressly intended for readers not sufficiently proficient in foreign languages. The magazine's statement with respect to the dissemination of scholarly knowledge is almost a prelude to an Enlightenment ethos: "suchlike laudable things" must "not remain obscured and hidden in private study rooms," but must be "shared with minds eager to teach and learn—indeed, with the entire respectable world—in order to promote the commendable sciences". Scholars were to make an effort to advance "their own reputation and the instruction and teaching of their neighbour."[11] This was a clear call to popularise the knowledge found in rare and expensive books.[12] A programmatic promise was made to examine everything using "reason as a testing stone."

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[8] Happel 1682–1691 (note 3), vol. 1 (1683), preface.

[9] Originally entitled [Thomasius, Christian], *Schertz= und Ernsthaffter/Vernünfftiger und Einfältiger Gedancken/über allerhand Lustige und nützliche Bücher und Fragen Erster Monat oder JANUARIUS,* [*bis: DECEMBER*] *in einem Gespräch vorgestellet von der Gesellschafft derer Müssigen* (Frankfurt/M., Leipzig and Halle a.d. Saale 1688).

[10] See Holger Böning, *Welteroberung durch ein neues Publikum. Die deutsche Presse und der Weg zur Aufklärung. Hamburg und Altona als Beispiel* (Bremen 2002), and id., *Periodische Presse. Kommunikation und Aufklärung. Hamburg und Altona als Beispiel* (Bremen 2002).

[11] Happel 1682–1691 (note 3), vol. 1 (1683), preface. At the same time, the magazine also addressed educated readers. According to editor Eberhard Werner von Happel, the aim was for "the scholar to repeat, the one who understands to judge, and the common man to be educated along with all his children."

[12] Accordingly it was stated: "Certainly, dear readers, the material in our *Relations* is not an invention of its compiler, for otherwise it would not be worth much: he has gathered

Here was an obvious expression of a new awareness of the great importance of the natural sciences for understanding and explaining the world. Enthusiastic attention was drawn to the newly existing possibility of providing a natural explanation for all observable phenomena. "Human industriousness," it was maintained, "has now reached a level at which there is little or nothing in the natural world for which it is not possible to name a fundamental or at least a probable cause."[13] Happel's reference to the periodical scholarly literature that had been appearing for some time provides insight into his conviction that every type of natural occurrence could be explained:

> It is the natural scientists who are most occupied with this, and if they . . . have been properly supported there is now virtually no reason why fundamental and detailed accounts cannot be provided, based on the writings of Kircher, the Royal College, the Journal des Sçavans, the Curiosis Miscellaneis Academiae naturae Curiosorum, as well as those of Scott, Digby, Helmont, Descartes, Nieremberg, Aldrovandi, Bacon, Montano, Dapper, Red, Sturm, Tavernier, Della Valle, Thévenot, Neuhoff, Strauss, Schouten, Gage, Brown, Troil and many other suchlike travel accounts.[14]

A slowly growing public, according to the *Relationes Curiosae*, was discovering an interest in natural science and wanted to be informed about what was regarded as magnificent progress in the natural sciences. The new medium of the magazine made this possible.

From Natural Science to Practical Application: Christian Wolff and His Wonderful "Multiplication of Corn"

The step from investigating nature to practical application of resulting scientific knowledge took place in the early eighteenth century, particularly as a result of the emerging, ordered experimental economy. This new branch of practically oriented research into nature received important impulses from the philosopher Christian Wolff. A treatise he penned appeared in print in 1718, with the curious title "*Discovery of the True Cause of the Wonderful Multiplication of Corn*" [Entdeckung der Wahren

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it from the books of great and learned minds; hence, nevertheless, one may not say that the compiler is not an author of the same." Publishers and editors frequently referred to scholars by name and to learned periodicals. See Happel 1682–1691 (note 3), vol. 3 (1687), preface.

[13] Ibid., vol. 1 (1683), preface.

[14] Ibid.

Ursache von der wunderbahren Vermehrung Des Getreydes]. His purpose, as the author informed his readers, was "to shed light on agriculture and horticulture in order to encourage others to engage in useful observation of Nature." In particular, however, he hoped "to begin to bring agriculture and horticulture into the realm of science."[15]

Wolff's treatise was only 62 pages long but it promised much: to reveal one of the truths "on which the happiness of the human race is based." The copper-engraved frontispiece showed a sheath of grain towering above a mighty tree; the enthusiastic tone of the treatise corresponded to the image. Wolff wished to illustrate the perpetual motion of crop cultivation; he promised fruit by the "many thousandfold," for—as he revealed to arouse the reader's curiosity—he had discovered the almost "infinite" power of a single kernel of grain. Wolff's treatise was an early but typical example of a natural science that had begun to concern itself with transferring into practical application the discoveries made in tedious "laboratory" experiments.

Christian Wolff's laboratory was a garden, where he had been able to make function something that would now contribute to the perfection of agriculture: a single kernel planted in the ground and properly cared for grew into a large grain plant with many spikes. Encouraged by Gottfried Wilhelm Leibniz, who confirmed the importance of his discovery, Wolff proceeded with his experiments in the spring of 1716, moving them at this point to his bedroom. In a small box filled with garden earth, he planted one barley kernel and one oat kernel. In this secluded location, however, they lacked the moisture and sunlight necessary to grow and develop properly, so day after day the philosopher affectionately transported his miniature garden to an open window and provided it with the necessary moisture from well water and captured rainwater.

What Wolff discovered from his experiment was nothing less than the natural cause of the "wonderful multiplication of corn." By weighing, he determined that his plant brought forth a harvest one hundred times greater than what was obtained by conventional agriculture, where seeding led to production of only a single spike of grain from a single kernel. Like a prospector who had discovered a gold mine, Wolff imagined immeasurable riches to be within his reach: "I have demonstrated that Nature conceals an inexhaustible treasure and I have shown where to find it."

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[15] Wolff 1718 (note 1). The quotations are taken from the unpaginated preface.

We are concerned here not with the use of this method of horticulture applied to agriculture, but with the practical effects of experiments of this sort, undertaken by a prominent philosopher, on the development of the Economic Enlightenment and the Popular Enlightenment.[16] These effects were initially embedded in a broad contemporary discussion that lasted to the middle of the century and was renewed numerous times even in the second half of this century of the Enlightenment.[17] "I am pleased to confess," said the first contemporary comment, "that this material is not only remarkable but also of great importance and of very great necessity in that it does not consist—like most of the books that come out today, unfortunately, of purely whimsical content that serves more to advance the supposed reputation and knowledge of their authors than to serve their neighbours and the common good—but can bring immense and lasting benefits to all of the landed gentry as well as their dependants."[18] In 1749 Johann Friedrich Neumann suggested in one of the two main German-language journals of the Economic Enlightenment,[19] the *Oeconomische Nachrichten* edited by Peter Freiherr von Hohenthal, that an "economic society" be founded whose primary aim would be to compile "a rich store of proper experience that could be used to make economics—which I understand as agriculture in its fullest context—into a science." The members of this society were above all to be "agriculturists," who would support each other in word and deed in tillage, and who

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[16] A thorough compendium of sources concerning the development of the Economic Enlightenment and the Popular Enlightenment can be found in Holger Böning and Reinhart Siegert, *Volksaufklärung. Biobibliographisches Handbuch zur Popularisierung aufklärerischen Denkens im deutschen Sprachraum von den Anfängen bis 1850* (Stuttgart-Bad Cannstatt 1990ff.), vols. 1ff. This work also contains comprehensive listings of the research literature on the Popular Enlightenment, analysis of which is not included here for reasons of space. For a recent update on research, see Holger Böning, Hanno Schmitt and Reinhart Siegert (eds.), *Volksaufklärung. Eine praktische Reformbewegung des 18. und 19. Jahrhunderts* (Bremen 2007).

[17] For example, 'Von Vermerung des Getreides', in Joan Daniel Denso (ed.), *Physikalische Bibliothek* (Rostock and Wismar 1756), no. 5, 461–478.

[18] [Gottlob Christian von Happe], *Kurtze und wohlgemeinte Erinnerungen Uber des Herren Hof-Raths und Professor Wolffens in Halle Vor weniger Zeit heraus gegebene Entdeckung der wahren Ursache von der Wunderbahren Vermehrung Des Getraidigs, Dadurch zugleich der Wachsthum Der Bäume und Pflantzen überhaupt erläutert wird, Als die Erste Probe, Der Untersuchung von dem Wachsthum der Pflantzen* (s.l. 1718).

[19] Concerning the character and the concept of the Economic Enlightenment and the Popular Enlightenment, see Holger Böning, 'Gemeinnützig-ökonomische Aufklärung und Volksaufklärung. Zu Entstehung und Entwicklung einer praktisch-populären Aufklärung im deutschsprachigen Raum', in Siegfried Jüttner and Jochen Schlobach (eds.), *Europäische Aufklärung(en). Einheit und nationale Vielfalt* (Hamburg 1992), 218–248.

as "learned" farmers would not engage in agricultural production only to feed themselves "but would also skilfully apply themselves to determining the actual reasons for changes effected." One specific task of the society would be to thoroughly examine the conventional ways of engaging in agriculture, carry out experiments, and share the experience gained in the process. Neumann also proposed that the copper engraving that embellished Christian Wolff's treatise on the multiplication of corn be used to seal letters written by the society.[20]

In 1753 the same journal renewed the proposal Christian Wolff had made in his treatise on the multiplication of corn to establish an academy for agricultural and related sciences. The main responsibility of this academy would be to concern itself with useful and above all tested proposals for improvement, to be transmitted to the authorities and thereafter to the "common farmer" for practical implementation.[21]

Naturally, as was customary in learned disputes, refutations[22] were published that challenged the practicability of this method, to which Christian Wolff in turn responded with counter-arguments.[23] Above all, however, it was generally to be admired that a scholarly philosopher and natural scientist concerned himself with the details of agricultural practice. Even the King of Prussia sought information from Wolff about his new discovery.

Wolff's endeavours contributed to a practical orientation in academic institutions that was slowly gaining strength and ultimately led to numerous agro-economic prize competitions in Prussia and elsewhere.

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[20] [Johann Friedrich] Neumann, 'Le plaisir de la Campagne oder die Einrichtung und der Endzweck der zu errichtenden Critisch-Oeconomischen Gesellschaft, nebst der erforderlichen Invitation dazu', *Oeconomische Nachrichten* (1749), vol. 1, no. 5, 362–373. Neumann asked readers of the *Oeconomische Nachrichten* to contact him as a member of the society.

[21] 'Eines Unbekannten eingesendetes Antwort-Schreiben an einen guten Freund, worinn die Frage beantwortet wird: warum, ungeachtet aller Bemühung rechtschaffener und gelehrter Hauswirthe, man noch wenig Verbesserung in der Oeconomie verspühre?', *Oeconomische Nachrichten* (1753), no. 51, 190–206.

[22] The first such refutation appeared anonymously already in 1718. See von Happe 1718 (note 18).

[23] Christian Wolff, *Erläuterung der Entdeckung der wahren Ursache von der wunderbahren Vermehrung Des Getreydes, Darinnen auf die kurtze und wohlgemeinte Errinnerungen, welche darüber heraus kommen/geantwortet wird/Als die andere Probe Der Untersuchungen von dem Wachsthume der Pflantzen heraus gegeben Von Christian Wolffen* (Halle 1719, second edn. Frankfurt and Leipzig 1730, third edn. 1750). On Wolff's methods, see also C.F. Hoffmann, 'Empfehlung des Haferpfropfens, auch des Pflanzens und Säens des Getraides in Reihen', *Braunschweigisches Magazin* 33 (1789), 513–528.

A particularly notable example of the reorientation that was then beginning to take place among scholars and soon among many educated people as well, Wolff's treatise also paved the way for the establishment of two professorships in the cameral sciences [Kameralwissenschaften]. And in the context of these new debates largely inspired by Wolff, the first initiatives were taken for the establishment of economic and agricultural societies. Thus, for instance, in 1749 Johann Friedrich Neumann began experiments concerned with improving grain cultivation, which he presented to the public in a short essay of 32 pages together with a proposal for an economic society, as he considered this to be the best way for the economic sciences to gain acceptance and to improve agriculture. Writings such as his, Neumann maintained, had previously been read primarily by connoisseurs of agriculture who were not themselves engaged in practicing agriculture and contented themselves with "pure speculation," and only rarely by readers who were prepared to "risk something themselves" in practice. If—through the initiative of establishing a common connection in the form of an economic society—clergymen, civil servants, leaseholders and noblemen all became readers of economic writings, there would soon be a "considerable reformation." Neumann declared that, in any case, he was concerned to structure his presentation so "that it is entirely clear and thus easily intelligible even to the common man."[24] Soon thereafter a first proposal was made for an economic society in which two "reputable farmers" were also to be included as members so that their experience could be used as well to benefit a country through good agriculture.[25]

It also seems important to note in this context that Wolff's writing helped to bring about greater appreciation, among scholars and educated people, of the everyday labour in which the great majority of the population was engaged. The fact that in the second half of the eighteenth century it became impossible to show open contempt or even disrespect for the lower classes in public—a public broadly influenced by the ideas of the Enlightenment—was a phenomenon that had its beginning in the reorientation of scholars, of which Christian Wolff's writing is a typical and interesting example. Corresponding thoughts can also be found in one of the most important programmatic essays of the Economic Enlight-

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[24] Johann Friedrich Neumann, *Vorläufiger und ohnmaßgeblicher Vorschlag wie die mögliche Verbesserung des Acker-Baues im Grossen wahr und würcklich zu machen sey; Nach Anleitung seines edirten Beweises und Discourses hierüber* (Berlin 1749).

[25] *Schleisische Oeconomische Sammlungen* (Breslau 1754, 1757 and 1762), 3 vols., vol. 2.

enment—written originally for the court of Gotha—which became the first official printed statement of the Economic Society of Bern after its author, Georg Ludwig Schmid,[26] born in Aarau in 1720, became an honorary member of the Society in 1759. Johann Georg Zimmermann translated Schmid's "Observations on Agriculture" [Betrachtungen über den Landbau] from French; the text focused above all on considerations regarding the significance of agriculture, similar to the ideas expressed by Christian Wolff, who had been the first important philosopher to do this. The first chapter was entitled "On the respect we owe to agriculture." The welfare of a people, according to Schmid, does not require that everyone be a "planter"; "only those who are should be instructed and given protection."[27] To the satisfaction of the Economic Society of Bern, Schmid also addressed the issue of what means could be used to increase and expand knowledge about agriculture. This could not be done by the "planters" themselves; rather, as Wolff had believed, it had to become the task of scholars, whose discoveries so far were an "idle treasure . . . if they did not reach unto the husbandman". It was no coincidence that the subsequent plea for enlightenment of the "husbandman" and for legislation to support his education was an initial task of the Economic Society of Bern. The Society was familiar with idea of direct contact with the farming population from the very outset.

For philosopher Christian Wolff it was not yet possible to speak directly to the farmer and thereby transmit his discovery to the person who would render it useful in practice in the first place. Wolff needed a translator. Thus it was that the first piece of writing in the German language expressly concerned with bringing enlightenment to farmers became the most interesting testimony to Wolff's treatise. A village clergyman, Johann Caspar Nägeli from Fischenthal in the Canton of Zurich, had familiarised himself with the proposals for multiplication of corn, and he could not stop thinking about how to disseminate them to the agricultural population.

In 1738 the renowned Zurich publishing house Heidegger und Compagnie issued "The Inquisitive and Reverent Farmer's Faithful Guide" [Des

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[26] On Schmid, see Hans-Ulrich Seifert, 'Ein vergessener Schweizer Aufklärer: Georg Ludwig Schmid', *Lenzburger Neujahrsblätter* (1988), 110–127.

[27] [Georg Ludwig Schmid], 'Betrachtungen über den Landbau. Aus dem Französischen des Schweitzerischen Verfassers', *Der Schweitzerischen Gesellschaft Bern Sammlungen von landwirthschaftlichen Dingen* 1 (1760), 5–53: 8; see Béla Kapossy, 'Grosse Seele unter bemosten Hütten—Georg Ludwig Schmids Reformprogramm', in Martin Stuber et al. (eds.), *Kartoffeln, Klee und kluge Köpfe. Die Oekonomische und Gemeinnützige Gesellschaft des Kantons Bern OGG (1759–2009)* (Bern, Stuttgart and Wien 2009), 59–63.

Lehrnsbegierigen und Andächtigen Landmanns Getreuer Wegweiser], written by Nägeli. Inspired by the urge to bring enlightenment, Reverend Nägeli aimed to impel farmers—even those with the tiniest plots—to improve their husbandry. "Dear Farmer!" began his appeal to his readers, "in order to lighten the burden of your demanding vocation and ensure that you be blessed in your work, we have wanted to give you . . . reliable instructions . . . which we present in the form of a colloquy."[28] With surprising conciseness, Nägeli formulated the most important basic ideas of a Popular Enlightenment concerned with providing economic instruction for the farming population, with the aim of mitigating poverty and distress. On the title page was a quotation from Virgil: "Happiest of all are the farmers who know their fields well!" The upper portion of the frontispiece depicted a farmer standing in an elevated position with his arms raised, looking at the phenomena of Nature—the sun, moon, stars, and storms—portrayed in the heaven above. The lower portion showed farmers at work in their fields, using an implement constructed for lending by Nägeli himself, which allowed cultivation to be done by Wolff's methods. The words "Who am I to behold such wonders, Lord! May thy name endure forever!"[29] applied to both parts of the illustration.

Nägeli borrowed the title formulation of his publication from a religious work which he knew enjoyed great esteem among the rural population. His instructions for agriculture, presented in dialogue form as was customary in religious education, were followed in a second part of the publication by a book of devotions, prayer and songs.

Nägeli's publication clearly shows the direct path leading from Wolff's experiments to the Popular Enlightenment. While Christian Wolff was destined to remain a pioneer, Albrecht von Haller—who had important works by this leading philosopher of the German Enlightenment in his own library[30]—lived under conditions several decades later in Switzer-

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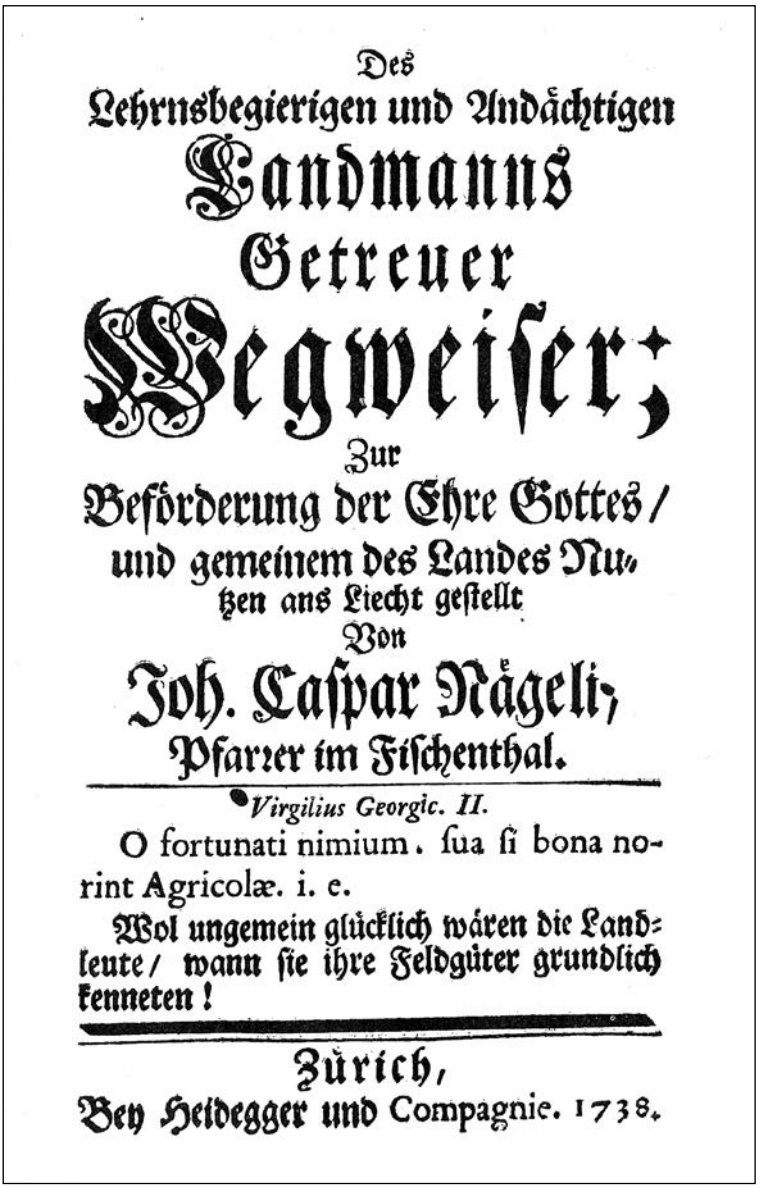
[28] Johann Caspar Nägeli, *Des Lehrnsbegierigen und Andächtigen Landmanns Getreuer Wegweiser. Nachdruck der ersten Ausgabe Zürich 1738,* with an epilogue by Holger Böning (Stuttgart 1992), unpaginated preface, 18*.

[29] It was rightly said of Nägeli that given his activities and his ambitions, he was born a generation too soon. See Diethelm Fretz, *Die Entstehung der Lesegesellschaft Wädenswil (Zöllikon)* (Wädenswil 1940).

[30] Haller's library, which had only a small section devoted to philosophical literature, contained a considerable collection of the works of Christian Wolff. See Maria Teresa Monti (ed.), *Catalogo del Fondo Haller della Biblioteca Braidense di Milano* (Milano 1983–1994), 13 vols.; on the library, see Barbara Braun-Bucher, 'Hallers Bibliothek und Nachlass', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller: Leben—Werk—Epoche* (Göttingen 2008), 513–518.


Des
Lehrnsbegierigen und Andächtigen
Landmanns
Getreuer
Wegweiser;
Zur
Beförderung der Ehre Gottes /
und gemeinem des Landes Nutzen ans Liecht gestellt
Von
Joh. Caspar Nägeli;
Pfarrer im Fischenthal.

Virgilius Georgic. II.

O fortunati nimium. sua si bona norint Agricolæ. i. e.

Wol ungemein glücklich wären die Landleute / wann sie ihre Feldgüter grundlich kenneten!

Zürich,
Bey Heidegger und Compagnie. 1738.

Fig. 1. Johann Caspar Nägeli: *Des Lehrnsbegierigen und Andächtigen Landmanns Getreuer Wegweiser* (Zürich 1738), title page.

Fig. 2. Johann Caspar Nägeli: *Des Lehrnsbegierigen und Andächtigen Landmanns Getreuer Wegweiser* (Zürich 1738), frontispiece.

land in which the obligation of the scholar to undertake activities for the public good and be committed to improvements in agricultural and domestic economy—by contrast with the early eighteenth century—had become an acknowledged principle among a considerably broader public. But there was still very little actual practical experience on which to base implementation of this commitment.

Albrecht von Haller as a Scientist Dedicated to Economic Patriotism

> *I would pay greater respect to a man who could produce two spikes of grain in a single place where only one grew before, than I would to all your clever statesmen . . . We must learn about Nature slowly and step-by-step.*
>
> Georg Ludwig Schmid, 1760[31]

Through his poetic and his scientific works, Albrecht von Haller had a significant influence on a public already engaged, in the fifth and sixth decades of the century of the Enlightenment, in intense debate in numerous journals about how scholars should be committed to the application of scientific knowledge to economics, improvement of food production, and agricultural reforms. At the same time, Haller's overall influence on the specific form of German and German-Swiss Enlightenment philosophy and natural philosophy was equally significant. The great respect he enjoyed as an author of the poem "The Alps" [Die Alpen][32] and as a scientist guaranteed that what he wrote would be well received everywhere.[33] It was characteristic of his work that the journey through the Alps which he undertook with Johannes Gessner not only resulted in publication

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[31] Schmid 1760 (note 27), 18.

[32] See Holger Böning, '"Arme Teufel an Klippen und Felsen" oder "Felsenburg der Freiheit"?—der deutsche Blick auf die Schweiz und die Alpen im 18. und frühen 19. Jahrhundert', in Jon Mathieu and Simona Boscani Leoni (eds.), *Die Alpen! Les Alpes! Zur europäischen Wahrnehmungsgeschichte seit der Renaissance. Pour une histoire de la perception européenne depuis la Renaissance* (Bern 2005), 175–190. See also Ferdinand Vetter, *Der junge Haller. Nach seinem Briefwechsel mit Johannes Geßner aus den Jahren 1728–1738* (Bern 1909).

[33] Nägeli 1738 (note 28), 20. Aside from referring to Christian Wolff, Nägeli, understandably, drew in the first place upon a scholar from Zurich: "This little work has drawn upon the writings of the most learned men, especially of Dr. Scheuchzer, who has rendered great services to our gymnasium in Zurich but also to the entire learned world, and is highly experienced in the school of Nature; as well as of Dr. Prof. Lange; Privy Councillor [Hofrath] and Prof. Wolff; Prof. Scheurer, Herr von Hochberg; Nieüwentyts; Hams; Mells; König; and others."

of this impressive and widely influential work of poetry but also in his laying the foundation for a comprehensive inventory of Swiss Alpine flora.[34] As the author of a comprehensive work on flora and of monographs, as well as a bibliography of all botanical writing up to his own day, he was a pioneer in botanical research in Switzerland and the Alps and a path-breaker in plant geography.[35] Together with his life-long friend Johannes Gessner, the founder of the Society of Natural History [Naturforschende Gesellschaft] in Zurich, he was dedicated to the utility of natural science for life and, as he put it, "its useful application in the best interests of the Fatherland and simultaneously the public."[36]

In 1753 Haller's convictions clashed with the views of Rousseau, who believed that the sciences absorbed all scholarly attention, causing agricultural practice to go forgotten. Haller offered a vigorous counter-argument:[37] "How much do the useful arts owe to chemistry, astronomy and geometry;

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[34] Urs Boschung, 'Haller botaniste et poète—A la découverte des Alpes', in Jean-Claude Pont and Jean Lacki (eds.), *Une cordée originale. Histoire des relations entre science et montagne* (Chêne-Bourg 2000), 86–119. "Die Alpen" became the most famous, and for natural philosophy and the perception of nature in the German and Swiss Enlightenment the most important didactic poem of the eighteenth century. Drawing on Virgil's "Georgics" and Lucretius's "De natura rerum", but also on the works of Scheuchzer, this descriptive-philosophical work contrasted the strong, pure natural and human landscape of the high mountains with the effeminating unnaturalness of civilisation. At the same time, the poem developed a critical counter-image to the real conditions prevailing in Switzerland, particularly under the patrician regime in Bern, and laid the ground for a Swiss national consciousness in the spirit of the Enlightenment. Among the German educated population the poem contributed to a downright vogue for enthusiasm about, and travels to, Switzerland. "Die Alpen" is largely responsible for the development of an image of Switzerland and the Swiss people in other European countries in which the moral purity of the Swiss was perceived as a result of the natural surroundings they lived in, sheltered from the sinful world by the Alps. This image also had important political implications, as class distinctions, professedly alien to Nature, were absent in the Alpine valley described in the poem. For more information about this, see Holger Böning, *Der Traum von Freiheit und Gleichheit. Helvetische Revolution und Republik (1798–1803)—Die Schweiz auf dem Weg zur bürgerlichen Demokratie* (Zürich 1998). Other philosophical didactic poems by Haller also addressed fundamental religious, ethical, and metaphysical issues.

[35] Luc Lienhard, 'La machine botanique. Zur Entstehung von Hallers Flora der Schweiz', in Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005), 371–410; Luc Lienhard, 'Haller et la découverte botanique des Alpes', in Pont and Lacki 2000 (note 34), 120–138.

[36] See *Johannes Gessner (1709–1790). Der Gründer der Naturforschenden Gesellschaft in Zürich; seine Autobiographie—aus seinem Briefwechsel mit Albrecht von Haller. Ein Beitrag zur Geschichte der Naturwissenschaften in Zürich im 18. Jahrhundert*, ed. with an introduction by Urs Boschung (Zürich 1996), 68, 75 and especially 117.

[37] For a survey of more than 30 years of Haller's critical activity, covering more than 9300 reviews from every field with the exception of jurisprudence, see Rudolph Gerhard, 'Hallers Rezensionen', *Sudhoffs Archiv für Geschichte der Medizin und der Naturwissenschaften* 49 (1965), 199–203, and Claudia Profos Frick, *Gelehrte Kritik. Albrecht von Hallers*

and precisely agriculture: how much has it been enlivened by knowledge of herbs!" The Bernese scientist spoke disdainfully of his adversary's reverence for "dumb blindness to the works of Nature."[38] "What was philosophy without students of Nature," asked the keen observer and empiricist who built on experience-based knowledge, "other than garrulous, muddle-headed and useless ignorance?"[39]

Even if Haller's relations with the Economic Society of Bern were initially marked by misunderstandings and must be characterised as tense,[40] he was nonetheless closely committed to their common efforts and exchanged thousands of letters with the Society's members.[41] He supported the main thrust of the Society's aims as they were programmatically expressed in its first published treatise. Here, in laudatory terms, it was stated that "philosophers attend to agriculture," and that it is of public benefit "to study agriculture, justified hopes for its advancement, and improved implements for its greater perfection."[42] It is likely that the ideas and the self-image of both Christian Wolff and Albrecht von Haller were fully reflected in the statement that it was not "the common folk who are constrained by their upbringing and absorbed by the cares of sustaining a livelihood" who are in a position to "bring agriculture to perfection; rather, it is the philosopher who pursues its principles, who combines these with experience, and who draws conclusions that will be of benefit to humankind." A false prejudice that attributed little esteem to

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literarisch-wissenschaftliche Rezensionen in den Göttingischen Gelehrten Anzeigen (Basel 2009). See also *Hallers Literaturkritik*, ed. by Karl S. Guthke (Tübingen 1970).

[38] Albrecht von Haller, *… Tagebuch seiner Beobachtungen über Schriftsteller und über sich selbst. Zur Karakteristik der Philosophie und Religion dieses Mannes*, ed. by Johann Georg Heinzmann (Bern 1787), 2 vols., I: 112f.

[39] Ibid., II: 160.

[40] See Bäschlin 1913 (note 6), especially 199–206; Martin Stuber and Regula Wyss, 'Der Magistrat und ökonomische Patriot', in Steinke, Boschung and Proß 2008 (note 30), 347–380: 362–368.

[41] Martin Stuber, '"Vous ignorez que je suis cultivateur." Albrecht von Hallers Korrespondenz zu Themen der Oekonomischen Gesellschaft Bern', in Stuber, Hächler and Lienhard 2005 (note 35), 505–541; on economic patriotism in Switzerland generally, see Georg C.L. Schmidt, *Der Schweizer Bauer im Zeitalter des Frühkapitalismus. Die Wandlung der Schweizer Bauernwirtschaft im achtzehnten Jahrhundert* (Bern 1932), vol. 1 and (Bern and Leipzig 1932), vol. 2. See also André Holenstein, Martin Stuber and Gerrendina Gerber-Visser (eds.), *Nützliche Wissenschaft und Ökonomie im Ancien Régime. Akteure, Themen, Kommunikationsformen* (Heidelberg 2007). An interesting example of the practical impacts of the Economic Society of Bern is given in Hubert Steinke, 'Die Einführung der Kartoffel in der Waadt 1740–1790. Agrarmodernisierung aus bäuerlicher Sicht', *Zeitschrift für Agrargeschichte und Agrarsoziologie* 45 (1997), 15–39.

[42] [Schmid] 1760 (note 27), 7.

knowledge of the art of domestic economics kept people of intellect from devoting themselves to these things. The ambitions of scholars were more easily pleased by inflated erudition, which for such a long time enjoyed respect in our country." "This prejudice is subsiding," it was stated with pathos, "the government can destroy it. The kingdom of words is dying away; the rule of things will gain the upper hand."[43]

Studies on agriculture undertaken at the Swedish Academy of Sciences and the Academy of Agriculture in Florence were praised in the full spirit of Wolff: "It would be highly desirable if the other academies, whose number has already grown considerably, would for once concern themselves more with following these examples that prove love for the common good than always with trifling, shrewd and worn reproaches."[44] The treatise published in Bern was similarly indebted to Wolff's convictions with the following words, put in the mouth of a king: "I would pay greater respect to a man who could produce two spikes of grain in a single place where only one grew before, than I would to all your clever statesmen."[45] This was followed by a detailed plea for activity by natural scientists concerned with research and experimentation who should attend to agriculture and seek the causes of fertility and infertility—a plea that appears almost like a description of the natural-scientific approach taken by Albrecht von Haller. This applies particularly to the fifth chapter of this treatise that introduced the activities of the Economic Society of Bern. This chapter was concerned with "ways of multiplying and improving the fruits of the earth": "Fertility of the earth requires that the fruits it is to bring forth agree with its nature." This motto could also have applied to many of Haller's writings.[46]

Research of this sort was to be anchored in newly established academies or in new classes offered in old academies "whose members are paid to pursue only this science and nothing else."[47] The Economic Society of Bern was seeking to take over such academic functions itself, through research activities in natural science that were being undertaken by certain individual members. However, it saw its primary duty as testing and disseminating the results obtained.

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43 Ibid., 35.
44 Ibid., 8, 12 and 16f.
45 Ibid., 18.
46 Ibid., 27.
47 Ibid., 36.

> The discoveries of scholars would be an idle treasure if they were not made known to landowners and if they did not reach unto the husbandman. The owner of lands, who commonly has enjoyed an education and often reads with ease, could educate himself through the treatises to be published by an academy. The farmer could be instructed through distribution of a brief, sound, clear and simple outline of the main basic principles of agriculture and the methods most appropriate in his province—an outline that should be introduced in the schools where the farmer's children receive their education.[48]

Of particular importance to the Bernese variety of such enlightenment were the details given with regard to "the assistance of the legislator in the advancement of agriculture."[49] These details were concerned with agricultural laws, improvement of public education, and the establishment of a financial system which would avoid "the burden of taxes falling mainly or arbitrarily on the farmer."[50] There would also have to be a guarantee of land ownership for farmers, as it was impossible for "agriculture to flourish in a country where the people are merely bondmen or leaseholders" or burdened by tithes and duties.[51] Mention was also made of promoting trade in agricultural products, so that the soil could be used everywhere in accordance with its nature and bring the greatest benefit. The greatest attention was to be given to furthering the cultivation of grain. One quintessential feature was that legislation should rely on compensation rather than constraint, if the goal was for "agriculture to come to its complete perfection." Indeed, "Rewards should not always be given in monetary form. In the honours that he has to bestow, the landlord possesses a rich treasure . . . We must not believe that the simple souls among us are closed to ambition. Nature does not so withhold its bounty that it does not frequently produce a great soul under a moss-covered hut."[52]

"Simple souls" was addressed to Albrecht von Haller the author of the poem about the Alps, while the challenge to research nature with a view to improving agriculture was addressed to Haller the renowned scientist.

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[48] Ibid., 38. The author of this work offered an unspecified example from Germany to illustrate that such dissemination of useful knowledge was possible: "Although these directives no longer have their original force, the skilfulness of the residents of this country is still astonishing, surpassing that of their neighbours. All the villages have good music in their churches, and there are few villages where one cannot meet farmers who are able to perform the loveliest Italian concert."

[49] Ibid., 39.

[50] Ibid., 40.

[51] Ibid., 42.

[52] Ibid., 50.

Haller approved of the views of the Economic Society of Bern as expressed in this programmatic treatise: "This is work for special scholars, and its execution will bring them greater honour than so many useless writings that put the world to sleep."[53] Man's mastery of Nature is "the noblest form of ambition," ran the motto to which Haller was as dedicated as he was to the programme of economic patriotism in Switzerland.[54]

In any case, Haller's interest was not in exotic plants, for which he cared little; already as a young man he turned his particular attention to useful plants.[55] In 1990—a time when the Economic Society of Bern was not yet the best-researched in Europe—Reinhart Siegert and I included numerous economic writings by Haller in the first volume of our bibliography of the Popular Enlightenment. The reason was that they were outstanding examples not only in how they conveyed the knowledge of a scholar to the scientific public, but also in how they transformed it into the world of those who were engaged in the practical aspects of enlightenment and could transmit new knowledge to people working in agriculture.[56]

As the long-time president of the Economic Society of Bern, Haller familiarised himself with the copious economic writings of his day, and was forced to see "what obscurity" still prevailed in terms of knowledge of what was necessary for practical agriculture.[57] From his work in the society he knew, with respect to his own scientific field of botany, that

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[53] Ibid., 53.

[54] Ibid.

[55] See Boschung 1996 (note 36), 71, where Gessner writes to Haller: "given that you do not like exotic plants."

[56] This is documented in the writings and Mémoires of the Economic Society of Bern of the years 1759–1796, which initially appeared in two languages, comprising 46 volumes in the German edition and 42 volumes in the French edition: *Der Schweitzerischen Gesellschaft in Bern Sammlungen von landwirthschaftlichen Dingen* (Zürich 1760–1761), vols. 1–2, published in French under the title *Recueil de mémoires, concernants l'oeconomie rurale par une société établie à Berne*; *Abhandlungen und Beobachtungen durch die oekonomische Gesellschaft zu Bern gesammelt* (Bern 1762–1773), published in French under the title of *Mémoires et observations recueillies par la Société oeconomique de Berne*; *Neue Sammlung physisch-ökonomischer Schriften*, ed. by Oekonomische Gesellschaft des Kantons Bern (Bern 1779), vol. 1, (Zürich 1782), vol. 2 and (Zürich 1785), vol. 3; *Neueste Sammlung von Abhandlungen und Beobachtungen*, ed. by Oekonomische Gesellschaft in Bern (Bern 1796). The entire publication series is available in digital format at: URL: www.digibern.ch.

[57] See Albrecht von Haller, 'Beschreibung der Geschlechter, Arten und Spielarten des Getreydes', *Neue Sammlung* 1782 (note 56), 1–94: 3f. Also: Albrecht von Haller, 'Abhandlung über die Futterkräuter der Neuern', *Abhandlungen und Beobachtungen* 1770 (note 56), vol. 11, no. 1, 1–48; on this entire paragraph, see Martin Stuber and Luc Lienhard, 'Nützliche Pflanzen. Systematische Verzeichnisse von Wild- und Kulturpflanzen im Umfeld der Oekonomischen Gesellschaft Bern 1762–1782', in Holenstein, Stuber and Gerber-Visser 2007 (note 41), 65–106.

misunderstandings arose from the non-uniform designations of plants that sometimes varied even from village to village: "This is the reason why economic advice given by one country cannot be understood by other countries and is thus made available in vain, to such an extent that it might as well be written in Hebrew."[58] According to Haller, the academic field of botany[59] was not aware of the practical significance that lay, for instance, in the exact identification and designation not only of different particular species of useful plants and grain, but of the different varieties of individual species as well. The latter could play such a great role "with a view to good progress or poor progress, or producing greater or lesser yields in a particular type of soil, that only one variety might merit planting in a particular location whereas another could not be planted without causing damage." "Plant experts" and "husbandmen" wrote in two different languages and did not understand each other; they lacked an interpreter "to serve between them."[60]

With respect to forestry, Haller maintained that one could read the relevant German-language books "without knowing for certain whether they were describing the pine or the spruce,"[61] and in his "Essay on Fodder" he reported that in reading European writings on agriculture he was forced to notice "that there was still little agreement between people working the fields and the scholars who dealt with plants in a scientific fashion."[62]

The fodder plants that Haller studied were one of the preferred topics of the entire Economic Enlightenment and one with which the Economic Society of Bern, too, was intensely preoccupied in its efforts to intensify agricultural production and to convey "useful knowledge" to the agricultural population for this purpose. Haller was concerned "to find a plant that will be more palatable and more nourishing than common

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58 Haller 1782 (note 57), 4; see Stuber 2005 (note 41).

59 Haller founded the botanical garden at the University of Göttingen, which was among the richest in Europe at the time of his departure in 1753. He also established numerous herbaria, most of which still exist today. His botanical and medical bibliographies covered the entire range of contemporary knowledge and for the first time included the periodical literature. Jean-Marc Drouin and Luc Lienhard, 'Botanik', in Steinke, Boschung and Proß 2008 (note 30), 292–314. Stephan Robert Gradstein and Michael Schwerdtfeger, 'Blüten der Gelehrsamkeit. Hallers botanischer Garten in europäischer Perspektive', in Norbert Elsner and Nicolaas A. Rupke (eds.), *Albrecht von Haller im Göttingen der Aufklärung* (Göttingen 2009), 183–206.

60 Haller 1782 (note 57), 4f.

61 Albrecht von Haller, 'Verzeichnis der in Helvetien wild-wachsenden Bäume und Stauden', *Abhandlungen und Beobachtungen* 1763 (note 56), 2 vols., 3–40, here from the unpaginated introduction.

62 Haller 1770 (note 57), 4.

grass, which can be cut repeatedly, and to which only the farmer would faithfully tend."[63]

In his search Haller concentrated on the different species prevalent among rural people, describing them in botanical and economic terms. His recommendation was made only after thorough screening of all known types of fodder and was based on his own experimental practice—not in the garden, as Wolff had done, but on meadows and fields.[64] In particular Haller wanted to make use in Switzerland of experience from England: "If only for the reason that English farmers describe their plants rather poorly, we must aspire to make them so recognisable to the farmer that he will not confuse them when he sees them."[65]

In reading Albrecht von Haller's economic writings, which made this scholar not least of all the founder of efficient cultivation of synthetic fodder in Switzerland, one is struck by the care required in the formulation of advice in order to keep from doing more harm than good in the rural economy. In the practical work of the Economic Society of Bern, cooperation between expert knowledge, own experiments and support of farmers in implementing new findings, for example by providing seed or by guaranteeing the sale of new plants, proved to be of value.[66]

Haller's determined, systematic pursuit of the tasks that the Economic Society considered especially important is impressive.[67] The first priority was a botanical description of the species of grain that were native to Switzerland "so that at least one friend can understand another in my own country." Using an anatomical knife and a magnifying lens, he examined and classified the varieties that he obtained over the years with the help of a European-wide network of learned correspondents.[68] In the careful,

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[63] Ibid., 5.

[64] Ibid., 33f.

[65] Ibid., 44.

[66] Steinke's 1997 (note 41) study is instructive also regarding the problems linked with these activities and the frequently limited ability of the economic patriots to see things from a farmers' perspective.

[67] In 1772 Haller wrote a "Treatise on the livestock plague" [Abhandlung von der Viehseuche], which was reprinted separately for wider distribution in 1773 and which made proposals for preventing livestock epizootics, as livestock production was a basis of national wealth in Switzerland. See Albrecht von Haller, 'Abhandlung von der Viehseuche', *Abhandlungen und Beobachtungen* 1772 (note 56), no. 2, 49–79 and, also by Haller, *Abhandlung von der Viehseuche. Auf H. Befehl verfasst* (Bern 1773). See also Martin Stuber, 'Wissenschaftler und Verwaltungsmann zugleich—Albrecht von Haller und die Viehseuchenpolizei', in id. et al. 2009 (note 27), 115–118.

[68] Haller 1782 (note 57), 5f.; see Martin Stuber, 'Kulturpflanzentransfer im Netz der Oekonomischen Gesellschaft,' in Regina Dauser et al. (eds.), *Wissen im Netz. Botanik und*

illustrative language he used in his reports, one frequently finds remarks such as "farmers themselves like this variety best; in northern regions they have taken to calling it heaven's barley or heavenly barley, considering it a plant sent from above for use by ordinary mortals."[69] Concerning rye, Haller knew, apparently through regular and accurate recorded observations, that "it grows 6 and 10 shoes high around Göttingen and gives a six-fold yield." He also shared individual observations: "When I travelled over the land and through the villages in Niedersachsen and Thüringen on a botanical expedition, the acid in the rye bread I consumed was always a sure cause of heartburn and indigestion, which immediately disappeared once I switched to wheat bread."[70]

Haller's essay on "Improvement of a moor landscape," published in 1764, was the work most informed by the agricultural experience he had gained as director of the salt mine at Roche. Reminiscent of Wolff, this work describes the fortuitous discovery of a grain that grew densely "in sturdy bushes" and had the advantage of greater resistance: "It endured the rain and storms that flattened my normal grain in 1763 and enriched my barn with very nice fruit that was worth preserving separately for use as seed."[71]

The Impact of Christian Wolff and Albrecht von Haller in the Popular Enlightenment: Similarities and Differences

This reference to the Bernese scientist's discovery also of a densely-branching grain can serve to complete the arc stretching from Christian Wolff to Albrecht von Haller. Both scholars were in agreement above all in their call for scientists and science to focus on the common good. Both would also have agreed with the appeal made by the Swiss scientist to enlightened authorities: "Never fear that the Earth will not be able to feed its many inhabitants; it would rather change from a field to a garden." As the first German scholar to found a school of thought, the baron and philosopher Christian Wolff practiced what Albrecht von Haller demanded of

Pflanzentransfer in europäischen Korrespondenznetzen des 18. Jahrhunderts (Berlin 2008), 229–269.

[69] Haller 1782 (note 57), 61f.

[70] Ibid., 79 and 80.

[71] Albrecht von Haller, 'Erfahrungen in Verbeserung eines Moorgrundes', *Abhandlungen und Beobachtungen* 1764 (note 56), no. 4, 54–70: 67.

a "worthy ruler" in one of his utopian novels: "Support the sciences among the people as well."[72]

The "people" was certainly a much more abstract concept for Wolff than it was for Haller. Wolff had little familiarity with agriculture in practice; his proposals for producing grain by planting a kernel and carefully tending the resulting stalks were impractical for larger farm operations and would have meant a transition from agriculture to horticulture—recommendable at the most for very poor smallholders and day labourers. Albrecht von Haller, by contrast, like many Bernese patricians, was as familiar with agriculture as he was with the rural population, for which he also showed interest. This was apparent not only in his prudent and successful measures to combat epizootic disease—which took account of rural attitudes, providing generous compensation for infected animals that had to be slaughtered[73]—but also in the thoughts continually interspersed in his other writings concerning the suitability of the proposals he made for the rural economy. Haller's view of the rural population was highlighted by a small report in the *Göttingische Anzeigen von gelehrten Sachen*, in which the readers of this academic journal were introduced to a farmer from Switzerland. This report was inspired by Kleinjogg from rural Zurich, a model farmer discovered by Caspar Hirzel who became famous throughout Europe as a "philosophical farmer" and the best known example of the discovery of the "people" in the second half of the eighteenth century.[74] Haller's report appears to be a straightforward account, like many other brief stories from the Popular Enlightenment, of proven virtue and rewarded industriousness. At the same time, it exhibits the mixture of economic-patriotic engagement and the class consciousness of a genuine citizen of Bern that was characteristic of many members of

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[72] Haller 1771 (note 2), 300 and 291. The following sentences in this work are noteworthy (299): "Do not allow assessments to be made under false pretences or taxes to multiply. Will you be richer if your people become poorer? Tolerable conditions for a farmer . . . will allow him to preserve his strength so that he can expand his cultivated land and turn wastelands into productive fields. The foreigner, oppressed by hard rulers, will implore that he be allowed . . . to cultivate barren areas. Both ways you will be able to increase your income precisely because you are not augmenting it. Rejoice when [your tenants] have a surplus left for their pleasure beyond the essential. They are human beings who have the same feelings as you . . ." For an initial survey of Haller's philosophical romances, see Christoph Siegrist, *Albrecht von Haller* (Stuttgart 1967); Florian Gelzer and Béla Kapossy, 'Roman, Staat und Gesellschaft', in Steinke, Boschung and Proß 2008 (note 30), 156–181.

[73] See Stuber 2009 (note 67).

[74] See details in the afterword to Caspar Hirzel, *Die Wirthschaft eines philosophischen Bauers*, with an afterword by Holger Böning (reprint of expanded Zürich 1774 edn., Stuttgart-Bad Cannstatt 1998).

the Economic Society of Bern. "On a farm in the district of Eschallen," Haller wrote, advising his readers of parallels with the farmer in Zurich, "a man has died whom no one praised but who has so earned the fame acquired by Kleinjakob that we must not miss the opportunity to bring justice to his memory." There followed a brief biography of this farmer, which was immediately also reprinted in the *Ephemeriden der Menschheit* since, according to an introductory note by Isaak Iselin, the editor of the journal, "it deserves to be known as an example of industriousness and rectitude."[75] Haller's unadorned story followed:

> Narbel from Goumoens de Jux lost everything to his creditors as a result of poor management. He had several grown children, including the son who is the object of our praise. This disgrace, he swore, will not affect us. Father, we will restore your honour as well as our own. His siblings worked day and night under the direction of their oldest brother, rooting out thorns and useless heath. The daughters did not marry, in order not to dissipate the family's goods through partial inheritance. The family restored itself. Narbel the younger became the leading citizen in his village and, solely through his industriousness in agriculture, amassed a full 16,000 Reichsthaler which he left to his children.[76]

Haller's comment about Narbel is revealing in terms of the ideas about class which he shared with many, but by no means all[77] exponents of the Popular Enlightenment, and which differed clearly from the ideas held by the economic patriots in Zurich, as exemplified by their *philosophical* farmer. Narbel was also Haller's tenant, as Haller had purchased the small estate of Goumoens-le-Jux in 1764: "His habits and his intellect were of a sort appropriate to his class, devoid of the poetic or the romantic. Klijogg, as he has been described to us, abandoned his class and became too much the thinker."[78] Examples such as this, according to Iselin's comments on this story—which can be read as a dispute between economic patriots in Bern and in Zurich—are the best teachers of virtue, although the real praise was due to the author of the report: "We therefore clearly owe thanks to the great man who rescued this story from obscurity, to which

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[75] 'Narbel ein zweyter Kleinjogg', *Ephemeriden der Menschheit* 3 (1776), 281–282: 281.

[76] Ibid., 282.

[77] See Holger Böning, 'Entgrenzte Aufklärung—Die Entwicklung der Volksaufklärung von der ökonomischen Reform- zur Emanzipationsbewegung', in Böning, Schmitt and Siegert 2007 (note 16), 13–50.

[78] Narbel 1776 (note 75), 282.

it would have been consigned without him. There are few lords of the manor who are able and inclined to pay such tribute to their tenants."[79]

Albrecht von Haller and the Economic Society of Bern both showed an early interest in rural populations as the most important target of their own efforts. This was characteristic of the Popular Enlightenment, and was perceived throughout German-speaking Europe, giving important impulses from the 1750s onwards to discussions among scholars engaged in the Popular Enlightenment. Wolff's thinking, by contrast, like his view of humanity, became a basis for the ethic of the practical Enlightenment and of its most important variety, the Popular Enlightenment. As early as 1720, in his "Reasoned Thoughts on Action and Non-action to Promote Human Happiness" [Vernünftige Gedanken von der Menschen Thun and Lassen, zur Beförderung ihrer Glückseligkeit], he issued a challenge to each individual human being to rise above pursuit of his own goals. Humans are obligated "to make not only themselves and their condition but also others and their conditions as ideal as it is in their power to do." In other words: "Humans are interrelated in order to promote their mutual happiness."[80] Such striving to promote the public good was rooted in the nature of human beings.[81] This "drive to perfection" among human beings propagated by Christian Wolff was referred to six decades later by a certain Rudolph Zacharias Becker in his prize question on the acceptability of popular deceit, the aim of which was to create a human right to education and information to which even the lower classes could appeal.[82]

Even if Albrecht von Haller was not of comparable fundamental significance with respect to the convictions that underlay the Popular Enlightenment, as someone who also embodied the aims of the Economic Society of Bern he was nonetheless a model of how striving to promote the public

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[79] Ibid., 281.

[80] Christian Wolff, *Vernünfftige Gedancken Von der Menschen Thun und Lassen, Zu Beförderung ihrer Glückseeligkeit, den Liebhabern der Wahrheit mitgetheilet* (Frankfurt and Leipzig 1733), § 767, 539 (quoted after the fourth "occasionally" augmented edn.) [also in *Gesammelte Werke* I, 4 (Hildesheim and New York 1976)]. The first edition appeared in 1720, followed by editions in 1723, 1728, 1733, 1736.

[81] Wolff 1733 (note 80), § 28, 20 states: "Whatever makes us and our condition imperfect is contrary to our nature and cannot be reconciled to it."

[82] *Beantwortung der Frage: Kann irgend eine Art von Täuschung dem Volke zuträglich sein, sie bestehe nun darinn, daß man es zu neuen Irrthümern verleitet, oder die alten eingewurzelten fortdauern läßt? Eine von der königlichen Akademie der Wissenschaften zu Berlin gekrönte Preisschrift, mit einer Zueignungsschrift an das menschliche Geschlecht von R.Z. Bekker. Teutsche, verbesserte und mit einem Anhange vermehrte Ausgabe* (Leipzig 1781), 141.

good—which had been established largely by Wolff—was to be expressed in terms of practical action taken by a scholar, together with the citizens with whom he was linked in society. The recognition accorded to Haller is frequently difficult to distinguish from that accorded to the Economic Society of Bern as a model of what an economic society should be. As a writer on economic subjects and a member of the Economic society of Bern, Albrecht von Haller performed precisely the type of task that Wolff had intended for an academy[83]—namely, to work as an unprejudiced scientist and thereby lift the burden and the risk of economic experiments from the shoulders of peasants and provide the rural population with sound advice. All of his work "always had the final aim of shedding light on important truths, making them generally known, or defending them,"[84] in the words of a generous tribute paid to the scholar in an "Encomium for Mr. Albert [!] Haller," published in the proceedings of the Economic Society of Bern. This tribute observed what was characteristic of Haller's conduct as a natural scientist:

> Our Haller also deserves exquisite praise for the fact that he never asked anything of Nature with the vain intent of coaxing her to support a preconceived notion, nor has he ever succumbed to the temptation only to fathom her secrets, wishing to subject her efficacy to the laws of a system; in disputes that were aroused by his discoveries, he has in fact always appealed to the power of experience alone.[85]

Christian Wolff and Albrecht von Haller were scholars dedicated to the principles of a practical and effective Enlightenment and efforts to popularise Enlightenment thinking among the rural population; they were among its most quoted progenitors and motivating forces in the last third of the eighteenth century. A biographical database of actors who promoted the common good in the economic Enlightenment and the

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[83] These details concerning the reorientation of academies found a considerable echo in debates on the Economic Enlightenment. See, for example, 'Eines Unbekannten eingesendetes Antwort-Schreiben an einen guten Freund, worinn die Frage beantwortet wird: warum, ungeachtet aller Bemühung rechtschaffener und gelehrter Hauswirthe, man noch wenig Verbesserung in der Oeconomie verspühre?', *Oeconomische Nachrichten* (1753), no. 51, 190–206; and *Christian Reicharts Land- und Garten-Schatzes 1. Theil* (Erfurt 1753), preface.

[84] [Vinzenz Bernhard Tscharner], 'Lobrede auf Hrn. Albert Haller', *Neue Sammlung* 1779 (note 56), 2–52: 42.

Ibid., 42 and 41.

[85] Ibid.

Popular Enlightenment[86] reveals that the obligation of scientists to focus their work on practical benefits, first propagated by Christian Wolff, found a good response not only among many university scholars but also led to practical engagements beyond the academy to educate the public, particularly among many ministers, doctors, chemists, biologists and jurists educated by university scholars. Many of these educated disseminators of knowledge were authors of functional works designed to make scientific findings available for everyday use to people who were engaged in agriculture and earned a living with their hands. Many also wrote entertaining literary works intended to popularise Enlightenment thought. These authors brought to germination the seed that Christian Wolff had planted and the fruits of which Albrecht von Haller subsequently cultivated more fervently than virtually anyone else.

[86] Data collected especially by Reinhart Siegert and partially by myself will be published as vol. 4 of our *Volksaufklärungsbibliographie*.

REPUBLICAN IDENTITY AND THE WORLD OF THE COURTS: THE CASE OF THE SAVANT ALBRECHT VON HALLER

Barbara Braun-Bucher

Renowned in German-speaking Europe as a poet, respected, established and influential in Göttingen as a scientist and organiser, Albrecht von Haller—a Swiss citizen and a republican—was commissioned in 1748 to compose tributes to the king on the occasion of his visit to Göttingen. "It is quite possible that in his first years here this poetry of his attracted more young people to Göttingen than his subsequent writings on anatomy and physiology . . ." according to one contemporary who was not entirely well-disposed towards Haller.[1]

In the summer of 1748 George II, King of England and Ireland and German Elector of Brunswick-Lüneburg, paid a visit to Göttingen. Festivities were organised on a large scale. The architectural theorist Johann Friedrich Penther, professor of mathematics and economics and chief inspector of the academic buildings, was responsible for the construction of a temporary triumphal arch and three honorary portals made of papier mâché,[2] while Haller was responsible for symbols and inscriptions. George II arrived in the city on 1 August in an official coach drawn by eight horses. The front side of the triumphal arch depicted the English king's military engagements—the victorious battle at Dettingen and the naval battle against the French off Cape Finisterre. The back side, with its statue of justice and the muses of the sciences, portrayed the king's influence as a guarantor of European peace and the country's pacification through education and culture owing to his founding of a university. A cantata was performed in St. Paul's Church [the Paulinerkirche] with lyrics, also written by Haller, referring to the king's deeds and the symbols.[3] Following graduation ceremonies and a visit to the library, the professors

[1] Ulrich Jost, '"Dieser unermüdete Geist . . .". Samuel Christian Hollmanns Erinnerungen an Haller. Aus seiner "Chronik der Georg-Augustus-Universität"', in Norbert Elsner and Nicolaas A. Rupke (eds.), *Albrecht von Haller im Göttingen der Aufklärung* (Göttingen 2008), 107–142: 142.

[2] Karl Arndt, 'Denkmäler in Göttingen: Dichter und Gelehrte', *Göttinger Jahrbuch* 23 (1975), 107–143: 110.

[3] Albrecht von Haller, *Versuch Schweizerischer Gedichte* (Bern 1777), 275–281.

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gathered in a semi-circle in the jurists' auditorium, where Gerlach Adolph von Münchhausen, curator of the university, personally introduced each one to the king. Haller, the Swiss, was addressed personally by the king, "with a very gracious expression" and the remark that "he should not contract the 'Swiss disease'" [die Schweizerkrankheit] of homesickness.[4] Even the subsequent evening serenade performed by Göttingen University students was based on a text by Haller. Eberhard Friedrich von Gemmingen from Heilbronn, the future minister of state for Württemberg and later a friend of Haller, presented the king with a printed version. Quite an honour for the republican in the Electorate of Hannover!

The Institution of the University under a Monarchy

At the turn of the eighteenth century the Electorate of Hannover began to develop into a major territorial power in the centre of Germany. The university that was to be newly established, like all older institutions of higher learning and especially the religiously oriented state universities, was intended on the one hand to educate future theologians, jurists, physicians and civil servants. From this function of the university as a place of learning for the elites of society, the state, the absolute central power, in the person of the curator, derived its extensive authority. In addition, the new university was explicitly intended to be open to contemporary scientific developments, according to the model of the so-called "reform" university [Reformuniversität] at Halle, and bring students "of rank" to Göttingen. The actual founder, Gerlach Adolph von Münchhausen, assumed the leading role, serving as curator of the state university until his death in 1770, along with his ministerial duties as President of the Privy Council in Hannover tending to the business of the Elector of Hannover, who resided in St. James as King George II. As an insightful moderator of current trends in science policy, he continually sought the advice of experts and was an advocate of the modern view that education in the sciences must prepare students to meet the requirements of a profession. He was also responsible for paying and recruiting the university's first professors.[5]

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[4] Jost 2008 (note 1), 122; see Urs Boschung, 'Heimweh, die "Schweizer Krankheit": vor 300 Jahren erstmals beschrieben', *Inselbote: Hauszeitschrift für das Personal des Inselspitals Bern* 2 (Juni 1988), 22–28.

[5] Ulrich Hunger, 'Die Georgia Augusta als hannoversche Landesuniversität. Von ihrer Gründung bis zum Ende des Königreichs', in Ernst Böhme and Rudolf Vierhaus (eds.), *Göttingen. Geschichte einer Universitätsstadt*, vol. 2: *Vom Dreissigjährigen Krieg bis zum*

Fig. 1. Georg Daniel Heumann: Triumphal arch for the visit of George II, 1748, Städtisches Museum Göttingen.

Fig. 2. Gerlach Adolph von Münchhausen (1688–1770). Oil painting by G. Boy (1747), Niedersächsische Staats- und Universitätsbibliothek Göttingen.

The Immigrant from Bern

After earning his degree as a doctor of medicine in Leiden under the direction of the renowned Hermann Boerhaave, going on an educational tour to London, Paris and Strasbourg, and studying mathematics under Bernoulli in Basle, in 1729 Haller initially sought to recruit patients from

Anschluss an Preußen—Der Wiederaufstieg als Universitätsstadt (1648–1866) (Göttingen 2002), 139–213: 143–144; Hubert Steinke, 'Science, Practice and Reputation. The Göttingen University and Its Medical Faculty in the 18th Century', in Ole P. Grell, Andrew Cunningham and Jon Arrizabalaga (eds.), *Centres of Excellence? Medical Travel and Education in Europe 1500–1789* (Aldershot 2010), 287–303.

patrician circles with the help of friends and relatives and establish himself as a physician Bern.[6] He failed to obtain a position, then open, as the fourth city physician, probably owing to his young age and the numerous other candidates for the position, and he withdrew a subsequent application for a professorship of oratory in favour of a friend. In 1735 another friend, Franz Ludwig Steiger, son of the current mayor [Schultheiss], offered him the job of librarian at the city library, as he himself had been elected to the Great Council. In 1732 Haller married Marianne Wyss, daughter of Squire of Mathod and la Motte, a pharmacist and the well-situated owner of a large spice business. She was the niece of mayor Isaak Steiger, father of the librarian.

In the contemporary context, Bern was seen as a wise government, with a clever, financially stable and efficient administration, that did not act according to fashionable trends or evince zealousness. But there were laments about its development towards oligarchy. This period was indeed characterised simultaneously by equilibrium and dynamic, constancy and reform, continuity and change. Problems as well as efforts to undertake reform found their expression in petitions addressed to the Council in the years 1710, 1735 (in this case by Haller himself), 1744, 1749, and again later in the 1780s. The same unresolved problems continued to crop up: the declining portion of the citizenry eligible for government service in the government, the de facto exclusion of eligible citizens—usually craftsmen and traders—from council positions and government offices, modifications of voting procedures and expansion of the councils, the definition of sovereignty, the responsibilities of individual government bodies, and debates about trade and luxury. Behind the scenes there was a constant process of balancing power in an attempt to preserve a fragile equilibrium. This process was an obstacle to reform.[7]

In 1732 Haller published his *Versuch Schweizerischer Gedichte(n)*, at first anonymously.[8] He advocated tolerance and freedom of speech, supported religious diversity after having witnessed its functioning in the Netherlands, and, in "Verdorbene Sitten" and "Der Mann nach der Welt",

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[6] Details on Haller's biography from Urs Boschung, 'Lebenslauf', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Bern 2008), 15–82; for Haller's earlier activity as a practicing physician, see Hubert Steinke, 'Der junge Arzt und seine Patienten: Albrecht von Hallers Praxis in Bern 1731–1736', in Elisabeth Dietrich-Daum et al. (eds.), *Arztpraxen im Vergleich: 18.–20. Jahrhundert* (Bozen 2008), 79–87.

[7] Barbara Braun-Bucher, 'Schultheiss, Rät und Burger zu Bern', in André Holenstein et al. (eds.), *Berns goldene Zeit. Das 18. Jahrhundert neu entdeckt* (Bern 2008), 432–440: 432.

[8] [Albrecht von Haller], *Versuch Schweizerischer Gedichten* (Bern 1732).

used satire to attack deficiencies in the Republic as well as the foibles of individual council members. Everyone was aware of the author's identity, and some Bernese patricians thus felt they had been attacked personally. The preface was meant to mitigate the controversial effect of the poems and it amused friends of Haller who were in the know: "You have armed yourself against all your attackers in your preface, which really gave me a good laugh," wrote Peter Giller, a physician and fellow student from St. Gallen, on 7 August 1732.[9] Although the undeniably problematic issue of morals had already been coolly and factually dealt with in the Bernese *Freytags-Blätlein* in 1722 and was a recurring topic in sermons, there were no consequences for the authors or for pulpit orators. Haller's satire, however, was a provocation, and caustic responses from those he had targeted were not long in coming.

The rejected job applicant, practicing physician and anatomical researcher—for whom a *Theatrum anatomicum* of his own was equipped at the expense of the state in 1734 and who hoped in vain for a corresponding professorial chair and simultaneously for a government position in the Republic—also wrote a petition to the Council in 1735. In this text, the 28-year-old Haller raised questions about the future of the political system in Bern:

> Monarchies tend towards unlimited rule and despotism; democracies towards anarchy; and aristocracies end either in oligarchies or democracies. In ancient times both Athens and Rome moved closer to democracy step by step, and in modern times Venice and Genoa became oligarchies; what will be the fate of our own state? There is nothing to exempt it from the same accidents that befell similar republics.

Claiming to seek an answer as a sincere patriot who was neither partisan nor socially or emotionally committed, Haller concluded: "The state is exhibiting a tendency towards oligarchy; once it was most like a democracy, but it has gradually moved away from this form of government and is continuing towards the opposite pole."[10] Haller accordingly made proposals for remedying the decline in participation by citizens eligible for serving in the government. He expressed the opinion that rivalry among at least 80 families in the council guarantied its stability; he proposed

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[9] Burgerbibliothek Bern, N. Albrecht von Haller, Korr 105.19, edited in Katja Fehr-Hutter (ed.), *Peter Gillers Briefe an Albrecht von Haller 1727–1756*, dissertation in medicine, University of Bern, 2003, 89.

[10] Burgerbibliothek Bern, Mss.h.h. VI.53 (9).

additions to be made from the established noble families, Bernese subjects since 1536, of western Switzerland, as 26 of the 81 families represented in the Great Council were dying out. This would allow the state to avoid the threat of oligarchy. By attacking political and social injustices in the second edition of his poems published in 1734, this time under his own name, Haller made himself thoroughly unpopular. The thoughts of a sincere patriot were rejected with the argument that 80 families were not enough. His prospects for obtaining a government position in the near future were poor. To A.J. Hugo, the royal physician in Hannover—a doctor and botanist with whom he had been in contact for mutual exchange of seeds and plants since 1732—Haller declared his readiness to accept a call to the newly founded university there. Hugo facilitated contact with the curator of the university, Gerlach Adolph von Münchhausen.[11]

The Georgia Augusta: Well-Regulated Like a Republic

The University of Göttingen became a pioneering model of success thanks to the *esprit de corps* of its learned professors and students and a network of several individuals who were strategic thinkers and had contacts with the state government. The confidants of the government—a few select civil servants who were beholden to the court—constituted a type of autonomous ruling structure in the university.[12] What was new and original about Münchhausen's model—and here he was in complete agreement with Haller—was the conviction that the social mandate to provide education and training could best be realised through the freedom and autonomy of the sciences. The first step in creating the conditions for this was to abolish the right of the theological faculty to supervise and censor what was taught by other faculties. Religious tolerance was fostered in order to attract rich aristocratic and bourgeois students to Göttingen. A Catholic parish was founded in 1747 and a Reformed parish in 1752, and a publication office and a university pharmacy were established as well. Above all, however, planned development of the most important scientific library in Europe was begun.[13]

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[11] Hubert Steinke, *Der nützliche Brief. Die Korrespondenz zwischen Albrecht von Haller und Christoph Jakob Trew 1733–1763* (Basel 1999), 20–24 and 61–63.

[12] Hunger 2002 (note 5), 168.

[13] Peter Hanns Reill, '"Pflanzgarten der Aufklärung": Haller und die Gründung der Göttinger Universität', in Elsner and Rupke 2008 (note 1), 47–69: 48.

In a birthday speech addressed to George II on the occasion of the first meeting of the Royal Society of Sciences on 10 November 1751, Haller called attention to the university's model structures as the foundation for research, the search for truth, and expansion of the boundaries of knowledge. The Georgia Augusta, with its laws, structured curricula and timetables, absence of unnecessary entertainment, supervision of the morals of academic citizens, and encouragement of virtue as well as intellect, was well-regulated like a republic and guaranteed a legal basis for peaceful co-existence. At the same time, the paternalistic royal protector was ever-present, tolerating no compensation for misdeeds through fines that enriched the authorities. He was a strict chastiser of wrongdoers and a beneficent rewarder of outstanding services. He generously supported every aspect of the library, the botanical garden, and the anatomical theatre. Royal beneficence permitted dissection and expansion of knowledge about the human body at minimal expense.[14]

Another claim made by Münchhausen, the pre-eminent knowledge manager, was that the internal freedom achieved by the university must be secured by a carefully planned policy for recruiting professors who would teach in the spirit of enlightened scientific ideals. Renowned names could only be attracted with remuneration and favourable conditions—good salaries, recognition in the form of titles such as that of court councillor [Hofrat], social reputation, and social security for their families, such as insurance for spouses through a survivors' insurance scheme for the widows of professors [Professoren-Witwen-Casse]. This clearly structured model facilitated rapid acquisition of the necessary funding from the beneficent king and quick granting of a Privilege for the university by the Emperor.[15] Münchhausen did everything he could to create good working conditions in Göttingen for Haller, as well, and acceded to his many rather immodest demands in order to keep him there. Even ennoblement was sought from the Emperor in Vienna in 1749.[16] After Haller's return to Bern in 1753, Münchhausen, almost up to the time of his death in 1770,

[14] 'Rede an dem Geburtstage Georg des Zweyten: die königliche Gesellschaft der Wissenschaften sich zum erstenmal öffentlich versamlete, den 10. November 1751', in *Sammlung kleiner Hallerischer Schriften* (Bern 1772), 3 vols., II: 175–206: 185–186.

[15] Hunger 2002 (note 5), 145.

[16] Reimer Eck (ed.), *Albrecht von Haller in Göttingen. Ausstellung im historischen Saal der Paulinerkirche anlässlich des dreihundertsten Geburtstags Albrecht von Hallers* [*16.10.2008–18.01.2009*] (Göttingen 2008), 10, König Georg II. an die Geheimen Räte in Hannover [King George II to the Privy Councils in Hannover], 25 February 1749.

continued trying to lure him back to Göttingen with a great variety of favourable conditions.

Haller's Integration in Göttingen and the Development of a Network

Haller was called to a professorship in anatomy, surgery and botany at the newly founded Georgia Augusta in Göttingen for the winter semester of 1736/37. Shortly after he arrived, his wife Marianne died. For a long time at the beginning of his years in Göttingen he was in the grips of sorrow and depression, as reflected in his diary begun in the winter of 1736. Münchhausen called Haller's friend Johann Jakob Huber from Basle to Göttingen as a prosector "to encourage Haller and give him peace of mind";[17] in addition, Münchhausen created an anatomical theatre for Haller, provided him with a house free of rent, offered him the opportunity to develop the royal botanical garden, raised his salary several times, and granted him a leave of absence already in the winter of 1737 should he want to take his motherless children back to Bern. Haller found no peace; on 30 April 1738 his firstborn son died, while petty jealousies among colleagues and literary disputes irritated him and kept him on edge: "Certain intrigues and factions opposing the one that protects me have given me cause to seriously consider keeping open an option to return," he wrote to his friend Sinner in Bern in 1738. Doubting the favour of those in high positions he continued, "nothing would console me here on the blows of fate … my sights are always on the same: my homeland and my honour."[18] Haller was not averse to accepting honours. On 14 September he received the honorary degree of Doctor of Philosophy from the philosophical faculty; this was followed on 14 November by his being named personal physician to the British king, which moved him to remark: "In Bern, as you know, some doubted that I am of any use in general, others doubted that I am of any use in my art, and most were little impressed by the same talents (as I feel compelled to say) that have earned me respect in this country."[19]

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[17] Ludwig Hirzel (ed.), *Albrecht von Hallers Gedichte* (Frauenfeld 1882), CLXXVIII.

[18] Emil Franz Rössler (ed.), *Die Gründung der Universität Göttingen: Entwürfe, Berichte und Briefe der Zeitgenossen* (Göttingen 1855), 320, Albrecht von Haller to Johann Rudolf Sinner, 27 August 1738.

[19] Eduard Bodemann (ed.), *Von und über Albrecht von Haller. Ungedruckte Briefe und Gedichte Hallers sowie ungedruckte Briefe und Notizen über denselben* (Hannover 1885), 107, Albrecht von Haller to Johann Rudolf Sinner, 17 December 1738.

Applying his intellectual talents for the common good was a strong incentive for Haller. He spared no effort even in Göttingen to be elected to the Great Council in Bern—the springboard for any career in public life[20]—and had learned well in the meantime how to position himself as a politically astute academic in both scientific and social circles. Haller recommended Johann Samuel König of Bern, who had been banned from Bern for ten years in 1744 after signing a petition claiming traditional civil rights, to the Prince of Orange, whom König ultimately had to thank for his call to Franeker as a professor of philosophy and mathematics and his transfer in 1749 to Den Haag as a court councillor and librarian. In a letter to Johann Jakob Bodmer in Zurich, König nevertheless showed little reverence when he reproached Haller for failing to take a stand for the rights of citizens: "Here is M. Haller's response to me. Oh, politics—what power you have! He kneels before the golden calf like every peasant! He refuses to pass judgment on whether we are right or wrong, but I fear that he will have the occasion of soon being obliged to pass judgment in spite of himself."[21] It must be kept in mind that Haller was about to be elected to the Great Council and could probably not afford to be too obviously critical of the political system.

In the realm of science, however, he made no concessions in the sense of gallant erudition either in the dispute with Hamberger over the theory of intake of breath or during the polemics that resulted from his evaluation of van Swieten's interpretation of Boerhaave's theorems, or in relation to the theory of irritability.[22]

Haller's Contacts with Royal Courts

The University of Göttingen—the sovereign's object of prestige which was planned and administered by able officials with connections at the courts of Hannover, Brunswick, Kassel, Celle, Stuttgart, St. Petersburg, Stockholm, Dresden, Copenhagen and Turin—was the centre from which Haller built up most of his relationships and his international network of contacts.

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[20] Martin Stuber and Stefan Hächler, 'Ancien Régime vernetzt. Albrecht von Hallers bernische Korrespondenz', *Berner Zeitschrift für Geschichte und Heimatkunde* 62 (2000), 125–190: 145–159.

[21] Hirzel 1882 (note 17), CCXLIII.

[22] Hubert Steinke, 'Der Patron im Netz. Die Rolle des Briefwechsels in wissenschaftlichen Kontroversen', in Martin Stuber, Stefan Hächler and Luc Lienhard (eds.), *Hallers Netz. Ein europäischer Gelehrtenbriefwechsel zur Zeit der Aufklärung* (Basel 2005), 441–462.

Haller cultivated relationships with royal houses and even initiated them through distribution of his own writings. His poems and utopian novels, but also his scientific works were dedicated to the kings of England, the King of Denmark, the Queen of Sweden, the Bishop of Brixen, the Governor General of Austrian Lombardy, and the Crown Prince of Brunswick. The first edition of his compendium of Swiss flora was also sent to nobles interested in botany, including the Duke of Saxe-Weimar-Eisenach and the Prince of Wales. Haller had contacts with the personal physicians of kings and bishops, high-ranking officials, representatives of the Imperial Chamber Court, royal counsellors, heads of government, ambassadors from the Imperial Diet, ministers of state, and presidents of imperial chancelleries.[23]

Haller acted as an intermediary and recommended physicians and teachers seeking work to the Swedish and the English courts as well as to the Russian Demidov family, who were engaged in iron production and employed 40,000 people. He was sought for advice primarily about improving medical education in Stockholm and Dresden, as well as in Brunswick and the Electorate of Saxony, as he was a recognised expert in this field. The Bishop of Salzburg asked him about measures for enhancing the educational system; following his return to Bern, Haller built an image as a tireless admonisher on this issue. He gave and received information on constitutional law and the philosophy and history of law in as well as from Frankfurt, Göttingen and Hannover, and engaged in detailed discussions about the ideal form of the state—republic or monarchy. This accumulated general knowledge was at his disposal later as an advisor in the Republic. He engaged in countless consultations on economic and practical issues, about cattle plague in Holland, about agriculture, viticulture and beekeeping with the abbot in Adelberg (Württemberg), and about mineral resources, metal processing, grain shortages and climate change in Sweden. All this information later found practical application during his time as a magistrate.[24] Thanks to the long-established relations that he continually cultivated with the Swedish royal house and the House of Habsburg, Haller received specific mandates after his return

[23] See Urs Boschung et al. (eds.), *Repertorium zu Albrecht von Hallers Korrespondenz, 1724–1777* (Basel 2002), 2 vols.

[24] Martin Stuber and Regula Wyss, 'Der Magistrat und ökonomische Patriot', in Steinke et al. 2008 (note 6), 347–380; Martin Stuber, '"Vous ignorez que je suis cultivateur". Albrecht von Hallers Korrespondenz zu Themen der Oekonomischen Gesellschaft Bern', in id. et al. 2005 (note 22), 505–541.

to his homeland—such as arranging a loan at the City Bank of Vienna for Bern and, conversely, applying for a government loan in Bern at the request of Sweden.

Recognition from publications, his complex network of correspondence, exchanges of information and of articles such as seeds and books, his activity as a reviewer, and engagements as a counsellor and intermediary enhanced Haller's reputation. Just as important as his position as a scholar in the hierarchy of science and his recognition as a counsellor and expert was Haller's social standing. His every move was observed, evaluated, and analysed. Following his third marriage to the daughter of a professor from Jena, he enjoyed a stimulating social life and a solid circle of friends: "Here [by contrast with Bern] there is no need to detail the government favours and the difference in my status and how I am regarded by the general public. I hope that the signs of this will become more and more public. I have even found in my misfortune touching occasions for making friends who are astute, quick to act and influential with the powerful minister."[25]

Shortly after Haller was named a member of the Academy of Sciences in Berlin, Frederick II offered him favourable conditions in an attempt to attract him to the Prussian court. Unable to decide, Haller typically procrastinated with negotiations of this sort. Did he feel obligated to Münchhausen and King George? Was it the "godless" environment in Sanssouci, or the advice of Bernese friends who were urging his return to Bern? In any case, Johann Heinrich Samuel Formey, professor of philosophy at the French College and Secretary of the Academy of Sciences in Berlin, was to mollify the King and Pierre-Louis Moreau de Maupertuis, President of the Academy, regarding Haller's decline of the call to the Prussian court. Haller meanwhile wrote home: "The French are dominant at that court [Berlin] and they look down upon the rest of the world, especially the land whose fruits provide their nourishment. Such is the King's pleasure. I am not upset about avoiding the company of those whom I would have displeased and about whom I might have felt the same."[26]

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[25] Bodemann 1885 (note 19), 107, Albrecht von Haller to Johann Rudolf Sinner, 17 December 1738.

[26] Richard Hamel (ed.), *Briefe von J.G. Zimmermann, Wieland und A. von Haller an Vinzenz Bernhard von Tscharner* (Rostock 1881), 66, Albrecht von Haller to Vinzenz Bernhard Tscharner, 9 September 1750.

Haller's official contact in Hannover was Heinrich Eberhard Balck, privy secretary of the chancellery [geheimer Kanzleisekretär], who was responsible for university policy, finances, and administration. Balck supplied him with official government communications, and with Balck's help he frequently attempted to place protégés in suitable positions. Haller continued to correspond with Balck after his departure from Göttingen.[27]

Another interesting relationship existed with the royal court librarian and archivist, Christian Ludwig Scheidt, the one-time teacher of crown prince Frederick V of Denmark, one of the foremost historians of his time, who possessed a comprehensive collection of sources and published studies of national history, the history of the nobility, and legal history. The two correspondents both worked and wrote reviews for the *Göttingische Gelehrte Anzeigen* and engaged in knowledgeable discussion about the organisation of the Society of Sciences in Göttingen and the remuneration of contributing authors.[28]

Haller had many contacts in Württemberg, first with the ducal brothers raised at the court of Frederick II, but also with Charlotte Sophie von Bentinck from the House of Aldenburg, who resided intermittently at the royal residence in Stuttgart.[29] She had brought her entire inheritance into her marriage, but after feuding with her spouse she abandoned her possessions and spent extended periods of time at the courts of Copenhagen, Berlin and Vienna. On travels through Germany, Italy and the Netherlands, she collected coins and bronzes. She established contact with the Duke of Württemberg, and assuaged Frederick II—she too was approached by Haller in this regard—concerning Haller's decline of the call to the court at Berlin. She was in turn deployed to approach Haller about the offer of the position of chancellor at the University of Halle, and she also negotiated a loan for Austria with the state of Bern.

From 1748 Haller corresponded sporadically, and from the 1770s intensively, with Eberhard Friedrich von Gemmingen, poet, composer and head of the government in Württemberg. In the context of Haller's utopian novels they discussed the advantages and disadvantages of republics and monarchies, specific comparisons of the Republic of Bern and Württemberg, and topics such as luxury, famine, the operation of lotteries, fire insurance, the agrarian system [Agrarverfassung], road construction,

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[27] Boschung et al. 2002 (note 23), I: no. 42.
[28] Ibid., no. 928.
[29] Ibid., no. 77, 547 and 644.

purchase of grain by Bern in Württemberg, and a model for a plough developed in Bern for improving agricultural yields.[30] Haller also took up political and practical topics with Wilhelm Friedrich von Benckendorff, the chamberlain and forester for Duke Karl Eugen von Württemberg and later chamber president and first minister for Margrave Karl Alexander von Ansbach Bayreuth. Benckendorff consulted Haller as an expert, seeking information from him about salt extraction techniques, microscopic examination of blood, plant systems, porcelain manufacturing, chemical procedures, medicines, Bernese political institutions, supra-regional anomalies in precipitation, high grain prices, famines and the causes of the crisis of subsistence in 1770–1772, which Haller ascribed to excess mortality and a decline in baptisms and marriages.[31] Truly a wide spectrum for someone trained in medicine and botany!

Haller dedicated the new edition of his poems in 1762 to Queen Louisa Ulrika of Sweden, the sister of Frederick II of Prussia. The queen had initiated the founding of the Academy of Fine Arts in Stockholm in 1753. Haller's accompanying letter, although addressed to the monarch, was personally delivered by the president of the Swedish imperial chancellery, Ulric von Scheffer, one of the most influential men of the later reform period under King Gustav III. Scheffer also later transmitted the Order of the North Star to Haller so that he would not have to travel to Sweden to accept it.[32] Through the pastor, reader [Vorleser] and intimate counsellor Jean-François Beylon, the queen inquired with Haller about contacts with famous scholars in Paris, recommendable reading material, his opinion concerning the prince's inoculation, and taking soundings about whether a loan of 100,000 Ecus for Sweden was possible in Bern.[33]

The Returnee

This living monument—the renowned poet and scholar, physician and one-time university professor, creator of the royal botanical garden, president of the Academy of Sciences, scholarly reviewer and centrepiece of a far-reaching communication network—returned to his homeland in 1753 as town hall administrator [Rathausammann]: "Fate, as the clearest call of

[30] Ibid., no. 346.
[31] Ibid., no. 74.
[32] Ibid., no. 927.
[33] Ibid., no. 99.

An die
Allerdurchlauchtigſte Großmächtigſte
Fürſtin und Frau
Ulrika Luiſa,
der Schweden und Gohten Königin,
gebohrne Königliche Prinzeſſin in Preuſſen.

Die Dichter und Weiſen ſehen es als ein Recht an, die Vorzüge der Fürſten verkleinern zu dörfen. Der Weiſe, haben ſie vor vielen Jahrhunderten geſagt, iſt ein König, und der einzige König.

)(2 Weiſe

Fig. 3. Albrecht von Haller, *Versuch Schweizerischer Gedichte*, 9th ed. (Göttingen 1762), dedication.

divine providence, has brought me back to my fatherland. The many illnesses that I endured in Göttingen appear to have proven that the atmosphere and the work there were not conducive to my physical well-being."[34] Back in Bern, Haller wrote to Eberhard Friedrich von Gemmingen that he did not intend to return to Germany and would thus be unable to pay him a visit: "To tell the truth, the court is an element in which I was neither born nor raised and would inevitably remain a stranger . . ."[35] But the scholarly world abroad would not rest. In 1755 Haller received a call to the chancellorship of the University of Halle, with no less a figure than Leonhard Euler making the request in the name of Frederick II. Haller manoeuvred once again; from Berlin he was asked to state his "unequivocal conditions," while Münchhausen, with whom he was simultaneously negotiating a return to Göttingen, expressed the wish "that your Lordship make known your conditions in order to make everything quite precise for a report to H[is] R[oyal] Majesty."[36] The negotiations failed. Münchhausen tried for 17 years to persuade Haller to return to Göttingen. For his part, Haller remained torn between service to his fatherland, the Republic of Bern, his family obligations, and the university, research, and scholarly activity.[37]

His contemporaries reproached Haller for euphemising conditions in Bern after he took up his public office there. His later biographer, Johann Georg Zimmermann, wrote to him that

> The favour of the king [Frederick II] is certainly a welcome thing; I congratulate you with all my heart. I would tell you one thing, had you not said it yourself a quarter-hour after setting foot in Bern in 1753. You are no longer for this world. You owe your ungrateful country nothing but contempt, and that is easier to show in the Palace of Sanssouci than in Bern in the attic of the town hall.[38]

The "attic" was an allusion to the public apartment in the town hall that Haller occupied as administrator of the town hall.

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[34] Urs Boschung, *Haller in Göttingen 1736–1753* (Bern 1994), 94, Albrecht von Haller to Georg Thomas von Asch, 21 July 1753.

[35] Hermann Fischer (ed.), *Briefwechsel zwischen Albrecht von Haller und Eberhard Friedrich von Gemmingen und Bodmer: aus Ludwig Hirzels Nachlass* (Tübingen 1899), 6, Albrecht von Haller to Eberhard Friedrich von Gemmingen, 21 August 1753.

[36] Hirzel 1882 (note 17), CCCXXVII.

[37] Urs Boschung, 'Ein Berner Patriot. Hallers Lebensstationen', in Elsner and Rupke 2008 (note 1), 21–46: 40; id., 'Albert de Haller ambivalent: réussite scientifique à l'étranger ou réussite sociale dans la patrie', *Revue Médicale de la Suisse Romande* 112 (1986), 1051–1059.

[38] Hirzel 1882 (note 17), CCCXXVII.

Theories of Government and Virtuous Rule

As early as 1749, probably in connection with the so-called Henzi conspiracy, Haller wrote to his correspondent von Gemmingen of his plans to deal with different types of government in the form of novels. With reference to historically defined forms of government—the monarchy and the republic, Haller used the example of enlightened despotism (*Usong*), the model of English parliamentarianism (*Alfred*) and the system of government in the Roman Republic (*Fabius und Cato*) to show that state constitutions have the aim of promoting and ensuring the well-being of the subjects: "All constitutions aim to achieve the happiness of their people,"[39] he wrote in a dedication to Minister Count von Firmian in the preface to *Fabius und Cato*. Haller had already touched on the theme of the ideal constitution for a state, however, in his poems published in 1732 and in his unpublished petition of 1735. His categories were developed not from a priori rational judgement or from utopian models; they were the product of a process of abstraction in search of common features, in which the natural scientist drew conclusions from empirical issues just as he did from meticulously designed experiments. He deduced his findings from factual circumstances and from different opinions, customs and laws, always referring to concrete examples from ancient or modern history. In addition to contemporary works concerned with government and history, which he reviewed for the *Göttingische Gelehrte Anzeigen*, Haller drew primarily on his comprehensive collection of travel journals, for which he had shown a passionate interest since his student days in Basle.

Haller's reflections contrast, for example, with those of Rousseau, who did not accept the patriarchal scheme of the house as the model for the constitution of a state: Haller, assuming the natural dominance of the paterfamilias model, believed that irrespective of the governmental system princes and magistrates must rule like true patresfamilias. The prerequisites for this were personal qualities, a sense of justice, virtue, and sense of duty. The claim to power was linked with demands for the common weal and a belief in the ideal of a strong and stable state, rooted in fundamental laws and moral authority. In order to bring about these conditions, paramount attention had to be given to education, as it provided

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[39] Albrecht von Haller, *Fabius und Cato: ein Stück der römischen Geschichte* (Bern and Göttingen 1774). Dedication to Carl Joseph Gotthard von Firmian of 2 March 1774; preface of 15 March 1774; see Florian Gelzer and Béla Kapossy, 'Roman, Staat und Gesellschaft', in Steinke et al. 2008 (note 6), 156–181.

the knowledge necessary for governing and distinguished the ruler from other members of the government.

Haller advocated maintaining balance, which was continually at risk; for him, balance represented the greatest achievement in domestic as well as foreign policy: "The perfection of government consists not in preventing all discord, which is impossible, but in balancing the weight of the state with adequate counterweights so that it rights itself again if it tilts too heavily to one side."[40] This image was reminiscent of the iconography on the reverse side of the above-mentioned triumphal arch honouring George II, which also depicted the king's foreign policy deeds in times of peace. Mars, the god of war, holds a scale, one side of which appears to rise with the weight of the Austrian coat of arms while the other side sinks under the coat of arms of the Bourbons; the pressure of England's trident holds the scale in balance. The inscription on the arch read: AEQVILIBRIUM EVROPAE RESTITVTVM.[41]

Praise of Princes in Haller's Dedications

It was precisely these prerequisites for ideal regency—personal qualities, a sense of justice, virtue, a sense of duty, and pursuit of non-selfish aims to promote the common good—which Haller addressed in the dedications he wrote to magistrates and princes.

"One can never reiterate enough to princes that their happiness consists in the fulfilment of their major duty, the happiness of their subjects."[42] In a dedication to the mayor Isaak Steiger in the second edition of the poems first published under his own name in 1734,[43] Haller praised "the brave hand, the raw courage, the strong and unaffected mind" of the ancient confederates and recommended the emulation of simple, raw morals as the model for a virtuous way of life, thereby simultaneously serving national stereotypes. "One should not despise us [republicans]; we are the seat and the kingdom of freedom on earth . . . and he who has freedom

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[40] Albrecht von Haller, *Tagebuch seiner Beobachtungen über Schriftsteller und über sich selbst. Zur Karakteristik der Philosophie und der Religion dieses Mannes* (Bern 1787), 2 vols., II: 181–185 ('Über die Regierungsverfassung freyer Staaten'): 181.

[41] Haller 1777 (note 3), 279.

[42] Haller 1774 (note 39), preface.

[43] Dr. Albrecht Hallers . . . *Versuch von Schweizerischen Gedichten* (Bern 1734), dedication to Isaac Steiger.

of thought thinks well." In the early days of the confederation, however, the mind consisted only of reason and education had a militant character. Although this helped bring military fame, war caused "pleasantry and the muses to flee". Now victory had brought peace, embellishments were appreciated, the mind was acknowledged and treasured, and the mayor, after the tiring business of government, also valued the poet. Acquired knowledge of statecraft and political order, law, and history increased the "wisdom and majesty" of the mayor, who bore the burden of ensuring the welfare of the fatherland. History was progressing and being influenced and shaped in this enlightened age.

For Haller, King Frederick V of Denmark and Norway was the model of a prince who, following conquests, pacified the wild Nordic lands of the "Goths and Vandals" and helped bring about political stability and balance in the Baltic region by governing wisely. Advised by the influential Danish foreign minister and enlightened reformer Count Johann Hartwig Ernst von Bernstorff, he pursued an active policy of peace, improved overseas trade by founding trade associations, maintained neutrality, and supported art and science. To him Haller dedicated his magnum opus—the first two volumes of his major work on physiology.[44]

The Prussian princess Louisa Ulrika, sister of Frederick II and Queen of Sweden, had established a splendid royal household in Drottningholm Castle in the wake of the European-wide dissemination of French culture, where she assembled members of the Court party from literary and artistic circles in the high aristocracy. In the so-called Age of Liberty (1719–1772) the Privy Council [Riksrådet], which had existed since 1220 for the original purpose of mediating between the king and the people, came under the influence of the of the Swedish Parliament [Riksdag]. In 1720 this assembly of the estates—consisting of nobles, prelates, burghers and farmers—compelled the king, in the tradition of parliamentary autonomy and with reference to the achievements of the Glorious Revolution in England, to recognise the right of parliament to have a voice in government. The *Riksdag* was split into the aristocratic party of the "Hats" and the anti-aristocratic party of the "Caps". Moreover, the high aristocracy surrounding the queen gathered in the Court party, which refused to recognise the parliamentary constitution and attempted to gain greater

[44] Alberto v. Haller, *Elementa physiologiae corporis humani* (Lausanne and Bern 1757–1766), 8 vols., dedication to Frederick V of Denmark of 11 May 1757 (vol. 1) and 22 October 1759 (vol. 2).

influence for the king. The Court party gained influence and importance during the time of severe economic and financial crisis brought on by the Seven Years War, and parliamentary authority threatened to turn into rule by the aristocracy. In 1757 the queen attempted a coup d'état. But it was the young King Gustav III who first succeeded in August 1772 in abolishing the liberal parliamentary constitution, thus breaking the power of the estates.[45]

In 1762 Haller dedicated the ninth edition of his poems to Queen Louisa Ulrika of Sweden.[46] In the embellished language of a courtier, he projected onto the Queen all the ideals of a wise prince, such as benevolence, virtue, reliability, and serving as an exemplary model. He ascribed to her the enlightened demands for common weal, peace, cultural refinement, education and science. As the simple citizen made life easier for those around him by bringing light to the souls of friends or students, thus brightening a room or a cottage, so the wise and virtuous prince was bound to bring happiness and morals to millions of people if, like the sun, he filled the world with light and warmth and promoted science and reason, as well as knowledge of the good, among entire populations. The wilderness was replaced by cities and culture, and superstition by truth. Like a lighthouse, the prince showed his subjects the way to lasting happiness and eternity.

The Swedish East India Company, founded in 1731 and supported by the future queen, brought unfamiliar cultural objects such as porcelain, silk, mother of pearl, copper, tea and spices from China and Arabia to northern Europe on its ships. Contact with the sources of these goods, as Haller described it, brought new knowledge about foreign cultures and imparted more knowledge in a short time than had been done in the past one thousand years. In 1750 the royal couple constructed a Chinese pavilion filled with original articles from China in the park of Drottningholm Castle, the scene of court rural life. Haller praised Louisa Ulrika's facility with language and poetry, which inspired him, a solitary poet, to compose new verses.

During the preparation of the eleventh edition of Haller's poems in 1776, the question of using dedications from earlier editions arose. The political situation in Sweden had undergone fundamental change in the meantime. Following the royal coup of 1772, Haller had doubts about

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[45] Michael Roberts, *The Age of Liberty. Sweden 1719–1772* (Cambridge 1986).
[46] Haller 1777 (note 3), 2–4.

whether his unrestrained praise was still justified, yet he excused himself with politically strategic prudence: "My tribute to Louisa Ulrika has been printed, and although I wrote it only half-heartedly, given that it already appeared in the earlier edition it would have been an act of hostility, and a foolhardy act of hostility, too, to leave it out. I have friends in Sweden who told me such things that I almost came to regret my flattery,"[47] he wrote to his friend Gemmingen.

From 1764 to 1769 two brothers of noble birth—Wilhelm August and Peter Friedrich Ludwig von Holstein-Gottorp, princes of Oldenburg, were staying with their tutor Carl Friedrich von Staal in Bern. Following the early death of their parents, they were placed under the protection of their cousin Catherine the Great, who sent them to Bern and to the knight academy in Bologna to be educated. Both were honorary members of the Economic Society of Bern, which had been founded in 1759. In 1772 Haller dedicated the third edition of his novel *Usong*[48] to the younger of the princes, Peter Friedrich Ludwig, making reference to enlightened educational ideals and the hope they would bring results. Better education of young people destined to rule was the greatest benefit of the age. They were no longer trained as hunters and warriors, as they were meant to rule over people. Although war might be a necessary evil, the aim of all wise princes was to achieve and maintain peace. A comparison with the Christian princes of the fifteenth century painted those of the enlightened eighteenth century in a more favourable light. Common weal was inextricably linked with the well-being of a prince's subjects and the wisdom of the prince. The name and heritage, and the talents and abilities of the young ruler-to-be, gave the citizen of a republic reason to hope for identification with the ideals of philanthropy. Haller hoped that his novel would have a general educational effect, and specifically that it would promote a reduction in duties and taxes on the subjects, as he wrote to Colonel von Staal: "*Usong* has not yet had an influence. But the Provost [Domprobst] von Wessenberg has read it with the Archbishop of Trier, and other German princes have done the honour of reading it. If only it made an impression on their minds! And could persuade them that the volume

[47] Fischer 1899 (note 35), 101–102, Albrecht von Haller to Eberhard Friedrich von Gemmingen, 21 September 1776.

[48] Albrecht von Haller, *Usong: eine morgenländische Geschichte, in vier Büchern* (Bern 1772), dedication to prince Peter Friedrich Ludwig von Holstein-Gottorp.

of duties and taxes enriches a prince as little as it enriches his people."[49] Peter Ludwig Friedrich von Holstein-Gottorp later became the sole heir to the throne after his brother fell from the mast of a ship during a storm and drowned while serving in the Russian navy. He indeed tried to emulate *Usong*, which he took as a model.

While he wished the prince to emulate an ideal model, Haller later compared George III, the third British monarch from the House of Hannover who had been born in England and ascended the throne in 1760, directly with Alfred the Great, the protagonist of his novel, both as a person and as a prince. He dedicated this excursus on parliamentary monarchy, which appeared in 1773, to the monarch on the "world's finest throne."[50] Like Alfred, George loved virtue, sought his only pleasure in good deeds, and never acted out of revenge. He sacrificed his brilliant victories to the more beneficial cause of peace, loved and was knowledgeable about the sciences, protected and promoted the arts, and acted justly as king, consort, son and father in accordance with his duties, distinguishing himself among all monarchs by these qualities—which were soon to be of benefit to millions of people brought into the British Empire through the incorporation of French colonies in Canada and India. May the descendants of the noble Alfred, Haller wished, sit on the British throne for thousands of years, promoting the happiness of their subjects and serving as virtuous examples. Haller had a life-long admiration for the British constitutional monarchy. George III, who pursued a relatively modest lifestyle and loved life in the countryside, was a personification of the wise, modest prince who understood the concerns of his subjects.

Haller, the "free Helvetian" republican, dedicated his last novel *Fabius und Cato*, about the Roman Republic, to the "His Lordship Carl, Count and Lord of Firmian, Knight of the Golden Fleece, Chamberlain, Privy Councillor [wirklicher Geheimrat], Governor of the Duchy of Mantua etc., and Minister Plenipotentiary in the government of Austrian Lombardy."[51] Karl Joseph von Firmian, an aristocrat and politician, art collector, and patron of the sciences and the arts, had been the Austrian Governor General

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[49] Berend Strahlmann, 'Albrecht von Haller und Herzog Peter Friedrich Ludwig von Oldenburg: mit Briefen Albrecht von Hallers an die Prinzen von Holstein Gottorp und an den Obersten von Staal', *Berner Zeitschrift für Geschichte und Heimatkunde* 20 (1958), 115–149: 127, Albrecht von Haller to Carl Friedrich von Staal, 25 September 1772.

[50] Albrecht von Haller, *Alfred, König der Angelsachsen* (Göttingen and Bern 1773), dedication to George III of England. Haller had already dedicated the second edition of his *Historia Stirpium indigenarum Helvetiae inchoata* (Bern 1768, 2 vols.) to the king.

[51] Haller 1774 (note 39), 3.

Albrechts von Haller,

Herrn von Gouvrens le Jur und Eclagnens,
Ritter des Nordsterns,
Präsidenten der königl. Gesellschaft der Wissenschaften in Göttingen, und der ökon. Gesellschaft zu Bern:
Der Römisch- und Russisch Kaiserl.
und königl. Französischen, Englischen Preuss. Schwedis.
Holländischen, Edinburgischen, Bononischen, Arkadischen,
Bayerischen, Crainischen, Upsalischen Akademien und Gesellschaften der Wissenschaften Mitgliedes.

Usong.

Eine

Morgenländische Geschichte,

in vier Büchern.

Neueste verbesserte Auflage.
Mit Kupfern.

BERNENSIS BIBLIOTHECA

Bern,
bey der Typographischen Gesellschaft.
1778.

Haller A 68

Fig. 4. Albrecht von Haller: *Usong: eine morgenländische Geschichte* (Bern 1778), title page. Burgerbibliothek Bern.

in Lombardy since 1756. After Haller's death, at the request of the state chancellor in Vienna, Wenzel Anton von Kaunitz-Rietberg, he purchased Haller's extensive library, "considered the best private library in all of Europe,"[52] along with his partly unpublished manuscripts, and integrated it into the Biblioteca Braidense in Milan.

As any constitution of a state, according to Haller, aimed to promote the happiness of its people, whoever contributed to this aim earned the thanks of all humankind. Haller, a free Helvetian, paid tribute to the active, enlightened minister who promoted the best for his subjects and who was a father to his brothers. The Alps did not prevent him from recognising in Firmian a praiseworthy man of this description.

The Republican Self-Image

Haller's works contain repeated references to republican self-understanding—the sense of individual and collective responsibility for the common political good, and the conviction that this common political good could endure only if citizens organised the state under conditions in which they were free and could act on the basis of shared responsibility. Haller preferred the aristocratic form of government for a republic: "Moreover, I have a definite preference for a republic and for aristocracy, the best government for a modest state, as one that is too extensive corrupts the morals of citizens. Venice is still the state that remained stable longer than any other."[53]

Haller also placed great value on political balance, as aristocracy tended either towards democracy, and hence anarchy and tyranny, or toward oligarchy, as in Bern in his day. Haller had already proposed a solution for this in 1735 by calling for revitalisation and an expansion of the number of actual ruling families, drawing on the established nobility in Vaud, a region subject to Bern. He continued to believe in this remedy. By contrast, he was far less interested in restoring the curtailed rights of citizens—the primary inducement to protests and submission of petitions in his time. The proportions of the estates had to be balanced in an exemplary republic.

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[52] Ferdinand Vetter, *Bericht über den handschriftlichen Nachlass Albrecht Hallers in Italien und den eingeleiteten Rücktausch eines Teils desselben für die Stadt- und Hochschulbibliothek in Bern und für die Schweizerische Eidgenossenschaft* (Stein am Rhein 1922), 2.

[53] Fischer 1899 (note 35), 47, Albrecht von Haller to Eberhard Friedrich von Gemmingen, 11 February 1773.

This would be achieved through tolerance, freedom of thought, patriotic virtue and—not to be forgotten—religion:

> In order to preserve the balance among estates that is appropriate to the spirit of a republic, and to overcome the prevailing difficulties in offering rewards, every member of the government should be motivated solely by a general feeling of fulfilling his duties with zeal, regardless of reward or retribution, and serve the fatherland with passion. This patriotic virtue must be grounded in religion.[54]

The reawakening of patriotic virtue would also guarantee the recovery of a republic corrupted by luxury.[55]

Haller's opinions were by no means accepted by his partners without dispute, although this did not impede mutual friendly understanding.

While Haller was writing his utopian novels, a spirited exchange about the advantages and disadvantages of different forms of government was taking place. In a discussion about the theme of the novel *Alfred*, Gemmingen maintained that the government of England, with its moderate monarchy and its parliament as a third force between king and people, was the best constitutional basis: "Monarchy is in every way the most suitable form of government for great and beneficent actions." The problem, however, was moderation, which was dependent on the person of the monarch; often the sons destroyed the work of their fathers.[56] Haller argued with his correspondents not only about the advantages and disadvantages of theories of the state, but also about terms, such as freedom, the seat and realm of which the Swiss located exclusively in the republic. Gottlieb Paul Werlhof, personal physician to the king and himself a poet and Haller's closest confidant and most faithful friend during his time in Göttingen, replied: "We are unlikely to agree about freedom. I see no distinction between republican freedom and freedom under the German monarchies; as the constitution ultimately has no influence on my way of life, I take no notice of it. For your present way of life, your studies and your character, it is of no consequence whether you live in such a

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[54] Haller 1787 (note 40), II: 184.

[55] On the debate over patriotism, see Simone Zurbuchen, 'Patriotismus und Nation. Der Schweizerische Republikanismus des 18. Jahrhunderts', in Michael Böhler et al. (eds.), *Republikanische Tugend: Ausbildung eines Schweizer Nationalbewusstseins und Erziehung eines neuen Bürgers* (Genf 2000), 151–181: 154.

[56] Fischer 1899 (note 35), 33, Eberhard Friedrich von Gemmingen to Albrecht von Haller, 2 September 1772.

monarchy or in a republic."[57] Werlhof was a citizen of the free Hanseatic city of Lübeck and also regarded himself as a republican.

In relation to implementing reforms as well as direct measures, methods differed under different forms of government: "It is true that institutions which serve the public good are more prevalent in free states: they waste little and are more solvent; moreover, a single patriotic speech in a council with many members can bring about great decisions. But a wise prince can carry out a thousand more delicate operations that are impossible for a republic."[58]

And what of Haller as a critic? He entered into the debate over luxury and lamented the decline of morals, and discussed the events of the so-called Henzi conspiracy of 1749 in numerous reviews in the *Göttingische Gelehrte Anzeigen*, where he also openly expressed his displeasure as a council member and aspirant to an administrative position. In a commentary on Lessing's short piece "Samuel Henzi," he maintained: "The sad incident of 1749 . . . is, according to friends and foes,"—he has thus listened to both sides!—"the fruit of excess luxuriance and squandering, of a decline in morals and a loss of the old civic virtue."[59] In an evaluation of the need to found an orphanage in 1755 as well, Haller cited the causes of the decline in morals: "The patrician arrogance and conceitedness of assuming to be born to rule and the comfort of receiving a contribution to one's livelihood without doing real work of any sort are the causes of this corruption . . ."[60] One is reminded of the criticism found in the poems of 1731 and 1733, "Die verdorbenen Sitten" and "Der Mann nach der Welt," which was nevertheless diluted by the foreword added in 1748, in which Haller cited the "thriving condition of my happy fatherland" as evidence that the basic rules according to which the top authorities (of the Republic) acted were sound and served the common good.

Haller maintained contacts with royal houses and court officials, heads of government, ministers and ambassadors through dedications of his works and by acting as an intermediary facilitating contacts with experts such as physicians and educators. And vice-versa: Haller was consulted

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[57] Paul Gottlieb Werlhof to Albrecht von Haller, 29 August 1738, Burgerbibliothek Bern, N. Albrecht von Haller, Korr. 105.70.

[58] Fischer 1899 (note 35), 25, Albrecht von Haller to Eberhard Friedrich von Gemmingen, 10 June 1772.

[59] D. Albrechts von Haller . . . *Versuch Schweizerischer Gedichte* (Göttingen 1751), foreword.

[60] Hirzel 1882 (note 17), C.

by court circles on questions of medical training, education, forms of government and constitutional law, and economics. Torn throughout his life between service to his fatherland, the Republic of Bern, responsibility for the body politic and the continued existence of his family in political affairs, and the world of science and research, the university, he still regarded the third option, in terms of the new sphere of influence offered by his summons to the court in Berlin, as a great honour. The environment was not completely comfortable, however. Life at court was too precarious, the intrigues too arcane, the shadow-boxing with sharp pens and refined rhetoric too hollow, French culture too dominant, and dependence on the favour of the king—on "princes who are really despots, including those who want to be philosophers"—too uncertain.[61]

As early as 1750 Haller wrote to his friend Gessner: "As far as my ennoblement [the certificate was dated 23 April 1749] and the new insignia honouring my family are concerned, although it is a sign of royal tribute, you nevertheless are aware how vain such privileges are in our fleeting lifetimes."[62] The republican with an acquired title which meant little at court and nothing at all in Bern[63] also assessed his place in the class hierarchy correctly: "Allow me the pleasure of no longer using the title 'Baron' when addressing me. I am certainly not a baron," he wrote to his friend Vinzenz Bernhard Tscharner in 1751.[64] It appears that the republican ideal of equals among equals had at ultimately won the upper hand: "People of great talent do not count for anything in republics."[65] This applied in 1744 to Samuel König, who was banned, and it also applied to Haller. But improvements were possible even in the best of all republics: "The more I contemplate our government, the more I assure myself that aristocracy is still the best form of government for a small state. We could do much greater good but we do little evil . . ."[66]

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[61] Fischer 1899 (note 35), 23, Eberhard Friedrich von Gemmingen to Albrecht von Haller, 30 April 1772.

[62] Boschung 1994 (note 34), 78.

[63] See Nadir Weber, 'Auf dem Weg zur Adelsrepublik. Die Titulaturenfrage im Bern des 18. Jahrhunderts', *Berner Zeitschrift für Geschichte und Heimatkunde* 70 (2008), 3–34.

[64] Hamel 1881 (note 26), 70, Albrecht von Haller to Vinzenz Bernhard Tscharner, 28 March 1751.

[65] Bodemann 1885 (note 19), 119, Albrecht von Haller to Johann Rudolf Sinner, 10 July 1744.

[66] Fischer 1899 (note 35), 60, Albrecht von Haller to Eberhard Friedrich von Gemmingen, 5 November 1773.

KNOWLEDGE PRACTICES IN THE ESTABLISHMENT AND REPRODUCTION OF THE MINING ELITE IN SAXONY, 1765–1868

Hartmut Schleiff

Introduction

The present article employs Bourdieu's methodology as an analytical tool for discussing the connection between education and professional advancement in Saxony's mining administration between 1765 and 1868. In doing this, it is necessary, on the one hand, to highlight education (a crucial aspect of "cultural capital",[1] in Bourdieu's terminology) as an important factor in upward mobility, but it is equally important to focus on sources that concretely illustrate his conception of the "habitus". Bourdieu defines "habitus" as "systems of durable, transposable *dispositions*, structured structures predisposed to function as structuring structures, that is, as principles of the generation and structuring of practices and representations."[2] Analytically, then, the aim is to understand the relationship between *dispositions* (which enable someone to do something) on the one hand and *cultural patterns of action* on the other hand, which (over a longer period of time) establish a social order. Transgenerational comparison will be used here in order to uncover explicit and implicit patterns of action, which can be established actively or taken up passively.

Cameralism and Mining

References to "encouraging" and "animating" [Aufmuntern] miners abound in cameralist writing on mining. They help us understand the extent to which the social order of Saxony's mining administration, the so-called *Bergstaat*, was structured by practices of symbolic classification that revolved around questions of honour. The task of improving mining

[1] See Pierre Bourdieu, 'Ökonomisches Kapital, kulturelles Kapital, soziales Kapital', in Reinhard Kreckel (ed.), *Soziale Ungleichheiten* (Göttingen 1983), 183–198 and id., *Homo academicus* (Frankfurt/M. 1998), 244ff.

[2] Pierre Bourdieu, *Outline of a Theory of Practice* (Cambridge 1977), 72.

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was outlined in 1766 by Johann Heinrich Gottlob Justi, a cameralist who was very familiar with the situation in Saxony. Justi had taught fiscal accounting, commerce and mining at the Theresianum in Vienna; he had inspected the mining facilities of Schemnitz as a Habsburg mining councillor; he was to become a mining councillor in Brunswick-Luneburg and a mining administrator in Prussia. Justi wrote that "the rulers' measures to enhance mining can be primarily divided into three classes: 1) The subjects are to be encouraged and given incentives to engage in mining; 2) mining must be organized so as to favour the development and exploitation of new mines; 3) the mining sciences are to be brought to greater perfection in order to educate able and skilled subjects."[3]

Such "encouragement" of mining targeted the "tribe of mountaineers . . . since none of the other classes of the state's dwellers easily adapts to this *way of life*, which is arduous and often involves danger to life and limb but nonetheless provides no more than a scanty livelihood. There is no estate deserving of more *encouragement* and less able to accommodate *depression*", the Saxon audit commission's mining report stated in 1771.[4] The report took up suggestions that had already been made within the cameralist sciences, by Justi among others, in the mid-eighteenth century.[5] In his 1766 *System des Finanzwesens*, Justi had described the specific conditions of mining in a similar fashion. The miners, Justi wrote, performed "work that is dangerous and detrimental to human health."[6] Hence, he

[3] Johann Heinrich Gottlob von Justi, *System des Finanzwesens, nach vernünftigen aus dem Endzweck der bürgerlichen Gesellschaften, und aus der Natur aller Quellen der Einkünfte des Staats hergeleiteten Grundsätzen und Regeln* (Halle 1766), 262: "Die Maßregeln der Regenten, um den Bergbau zu befördern, lassen sich vornehmlich in drey Classen bringen. Es müssen nämlich 1) die Unterthanen zum Bergbau aufgemuntert und angereizet werden; 2) die Art und Weise des Bergbaues muß zur Aufnahme und Beförderung desselben eingerichtet werden; und 3) die Bergwerkswissenschaften müssen in größere Vollkommenheit gesetzet und tüchtige und geschickte Subjecte in denselben erzogen werden."

[4] 'Revisionsbericht von Friedrich Anton von Heynitz, Carl Eugen Pabst von Ohain und Johann Polycarpus Leyser, 1771', ed. by Hans Baumgärtel, in id., *Bergbau und Absolutismus: Der sächsische Bergbau in der zweiten Hälfte des 18. Jahrhunderts und Maßnahmen zu seiner Verbesserung nach dem Siebenjährigen Kriege* (Leipzig 1963), 175: "Stamm der Bergleute selbst . . . da von den andern Claßen der Landes-Einwohner, niemand leicht zu dieser mühseligen, öfters mit Leib- und Lebensgefahr verknüpfften, in den meisten Fällen aber der Gesundheit nachtheiligen, und gleichwohl nur den notdürfftigsten Unterhalt gewährenden *Lebens-Art* übergeht. Kein Stand hat also mehr *Aufmunterung* nöthig, und kan weniger *Bedrückung* aushalten."

[5] See Justi 1766 (note 3), 286f.

[6] Ibid.: "gefährliche und der menschlichen Gesundheit nachtheilige Arbeiten".

argued, they should be encouraged to engage in mining by being granted "modest liberties and privileges."[7] Justi thus recommended:

> The welfare that is to be provided by the mining and financial administration boards for these workers must not only include the provision of care in cases of injury and sickness, for the purpose of which one needs mining hospitals, mining physicians and mining surgeons, but also the provision of livelihood for workers who are no longer able to work. For that purpose, in most of the well-administered mines, miners' guild insurance funds were established from which old or incapacitated miners receive a basic livelihood.[8]

Calls for the establishment of academic institutions concerned with mining, by Justi and others, preceded the founding of the Freiberg and Schemnitz mining academies by a number of years.[9] On this point, Justi agreed with the Saxonian commission councillor Carl Friedrich Zimmermann and his work *Von der Beschaffenheit einer Bergakademie* of 1746,[10] which likely emerged from Zimmermann's discussions with the mining administrator Johann Friedrich Henckel, with whom Zimmermann had been on friendly terms.[11] Justi subsumed the mining academies under "economic academies, societies and seminaries",[12] which "would be of great use for the common good, particularly as mining and naval academies, manufactory and handicrafts schools, mechanical schools and others."[13] In his

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[7] Ibid., 287: "mäßige Freyheiten und Vorzüge".

[8] Ibid.: "Die Vorsorge der Berg- und Finanz-Collegiorum vor diese Arbeiter, muß sich also nicht allein dahin erstrecken, daß sie bey Beschädigungen und Krankheiten umsonst mit Heilung, Cur und Pflegung versehen werden, zu welchem Ende Berg-Hospitalia, Berg-Medici und Berg-Wundärzte nöthig sind; sondern man muß auch vor deren Unterhalt sorgen, wenn sie nicht mehr zu arbeiten im Stande sind. Daher hat man bey den meisten ansehnlichen Bergwerken sogenannte Knappschafts- und Hütten-Cassen errichtet, woraus alte, oder zur Arbeit unfähige Berg- und Hütten-Arbeiter ihren nothdürftigen Unterhalt bekommen."

[9] See Johann Heinrich Gottlob von Justi, *Abhandlungen von den Mitteln die Erkenntnis in den Oeconomischen und Cameral-Wissenschaften dem gemeinen Wesen recht nützlich zu machen* (Göttingen 1755), 15.

[10] See Carl Friedrich Zimmermann, 'Von der Beschaffenheit einer Bergakademie', *Ober-Sächsische Berg-Academie: in welcher die Bergwercks-Wissenschaften nach ihren Grund-Wahrheiten untersuchet, und nach ihrem Zusammenhange entworffen werden* 1 (1746), 9–56. The title of the first (1746) edition of "Ober-Sächsische Berg-Academie", a periodical edited by Zimmermann, anticipated the Academy's future name years in advance.

[11] See Walther Herrmann, *Bergrat Henckel: ein Wegbereiter der Bergakademie* (Freiberg 1962), 101f.

[12] Justi 1755 (note 9), 15: "oeconomische Academien, Societäten und Seminaria".

[13] Ibid.: "als Berg und Marine Academien, Manufactur- und Handwerksschulen, mechanische Realschulen und dergleichen vor das gemeine Wesen von große[m] Nutzen seyn würden."

Grundsätze[n] der Policey-Wissenschaft, the second edition of which was published before the Freiberg and Schemnitz mining academies were founded, Justi recommended that practitioners of the mining sciences should "provide good teaching in such matters at universities as well as in specific mining academies."[14]

In order to encourage the "tribe of miners"[15] that resided in Saxony to engage in mining for generations to come, various measures had to be taken, the audit commission's report argued, pointing out that the Seven Years' War had caused vacancies which needed to be filled. The "encouragement" of mining and miners was to be achieved by establishing "proper uniform, simple and brief rights and special judges", as well as ensuring appropriate wages, low grain prices and widows' funds. Furthermore, he recommended "more general education for the mountaineers as well as advanced teaching for capable subjects, who will take up careers as officials in the mining administration."[16] The fact that the uniform is mentioned first is indicative of the importance that cameralist thought placed on the symbolic order of "social space".[17]

"Should and Should Wish to": Ordering Saxony's Bergstaat

Immediately after the sovereign had founded the Mining Academy in 1765,[18] which represented one of the most significant changes in Saxon's mining administration since the mining regulations of the sixteenth century,

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[14] Johann Heinrich Gottlob von Justi, *Grundsätze der Policey-Wissenschaft in einem vernünftigen, auf den Endzweck der Policey gegründeten, Zusammenhange und zum Gebrauch Academischer Vorlesungen abgefasset* (Göttingen 1759), 108: "sowohl auf Universitäten, als auf besondern Berg-Academien, guten Unterricht hierinnen veranstalten".

[15] Baumgärtel 1963 (note 4), 175: "Stamm der Bergleute".

[16] Ibid., 176: "eigene Tracht, Verfassung, einfache und kurze Rechte, und besondere Richter" and "allgemeinen mehrern Unterricht des Berg-Volcks, als besondern, weitergehenden Unterricht fähiger, zu Berg-Beamten bestimmter Subjecte".

[17] Pierre Bourdieu, 'Sozialer Raum und symbolische Macht', in id. (ed.), *Rede und Antwort* (Frankfurt/M. 1992), 135–154: 149. See also Pierre Bourdieu, 'Sozialer Raum und "Klassen"', in id. (ed.), *Sozialer Raum und "Klassen" und Leçon sur la leçon* (Frankfurt/M. 1995), 7–46: 10f. and Pierre Bourdieu, 'Sozialer Raum und politisches Feld', in id. (ed.), *Das politische Feld: zur Kritik der politischen Vernunft* (Konstanz 2001), 127–131: 128ff. See also Wolfhard Weber, *Innovationen im frühindustriellen deutschen Bergbau und Hüttenwesen: Friedrich Anton von Heynitz* (Göttingen 1976), 137f. On the iconology of the miners' uniform in the early eighteenth century, see Elisabeth Hackspiel-Mikosch, 'Vorläufer der zivilen Uniformen im 18. Jahrhundert', in id. and Stefan Haas (eds.), *Die zivile Uniform als symbolische Kommunikation* (Stuttgart 2006), 47–79: 72.

[18] See UAF [Universitätsarchiv TU Bergakademie Freiberg], OBA [Oberbergamt], call number 236, fol. 121.

a new uniform ordinance was decreed in 1769.[19] According to the new dress code, members of the Mining Academy obtained their own uniforms. "Especially during paydays, hearing days and holidays",[20] the regulations stipulated, the miners were expected to bear in mind "the old laudable mining spirit";[21] they should wear their Sunday uniforms or the miners' day parade outfit. They were not allowed to deviate from the regulations, such as by "inappropriate luxury",[22] and were thus to comply with the social and symbolic order established by the dress code. From 1827 on, any additional decoration was explicitly banned, since it was considered to be a breach not only of the uniform regulations but, more generally, of the mining administration's hierarchical structure, which the uniforms represented. The sovereign's insistence upon adherence to miners' laudable customs can also be found in a decree of the Elector of Saxony from 1668:

> Order is hereby given that you prescribe at any local mining authority that those persons who are in our services as miners or mining officials *should and should wish* to wear, in keeping with their respective rank, their age-old customary miners' uniforms during paydays, hearing days and holidays since it is a *laudable custom* and *redounds to their and all building trades' honour*.[23]

The language in the 1668 sovereign's order, "should and should wish to" [solle und wolle], reminds us of the long-lasting, continually resurfacing process of negotiation that surrounded the proper representation of the mining administration in its uniforms. The decrees responded to repeated breaches of effective orders which occurred over a long period of time. Another order calling for the miners' compliance with the old custom of

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[19] See Georg Wilhelm Albert Borchers, 'Vor 150 Jahren: Bergbau- und kulturgeschichtliche Bilder aus der Vergangenheit des Erzgebirges', *Jahrbuch für das Berg- und Hüttenwesen im Königreich Sachsen* (1916), A 181–197: 188.

[20] *Jahrbuch für das Berg- und Hüttenwesen in Sachsen* (1929), 186: "insbesondere an Lohn-, Bergamts- und Feyertagen".

[21] Ibid.: "des alten löblichen bergmännischen Geistes".

[22] Ibid.: "unpassenden Luxus".

[23] Ibid., 187: "Als begehren wir hiermit gnädigst befehlende, ihr wollet bey jedes Orts Bergämtern die ernste Verordnung thun, daß sie auf solche Personen, die in Unsern Diensten und der Bergarbeit zugethan, bey den Amts-, Lohn- und Feyertagen Achtung geben lassen und so einer oder der andere befunden, dessen gebührlichen verweisen und sie hingegen mit Zugemüthführung, daß, weil es eine *löbliche Gewohnheit*, auch allen bauenden Gewerken und *ihnen selbst zu Ruhm und Ehren gereichet*, jedweder *nach seinem Stande* in seinem uralten bergbräuchlichen Berghabit sich hinführo bey obgedachten Amts- und Feyertagen befinden lassen *solle und wolle*". (my emphases).

wearing the miners' uniform during holidays and hearing days was issued, for instance, in 1749.[24] On the one hand, the miners' uniform was a "laudable custom"[25] which was ordered by the regent's decree and controlled by the mining authorities. On the other hand, it represented a living tradition which had been passed down through numerous generations. These interdependencies between *regular* social practices on the one hand and their effective *regulation* by rule on the other illustrate the function of miners' uniforms as "principles of the generation and structuring of practices and representations."[26] In this decree, the mining administration was both manifested and presented in its structural elements, which were colour-coded according to mining districts and hierarchical levels. The decrees concerning marching formations during miners' parades reveal similar concerns. Such cultural strategies for visualizing social structures were consistent with the schematic representation of the mining administration in mining almanacs. In these almanacs, imagery and text provided a form that represented the administrative and social structure of Saxony's mining administration, i.e. of Saxony's mining experts. Soon, the task of representing the administrative hierarchy in the almanacs was taken up by the mining administration itself, as only this body could ensure the scheme's accurateness, as the mining administration claimed in the 1827 edition of the almanac.[27] The administration's insistence on taking on the responsibility for publishing the mining almanac can be considered a conscious strategy of social self-representation within the *Bergstaat*. The mining almanacs of the 1790s, which were edited by Alexander Wilhelm Köhler, contained representations of both the hierarchical schema[28] and the uniforms.[29]

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[24] See ibid., 188.

[25] Ibid., 187.

[26] Bourdieu 1977 (note 2), 72.

[27] See *Jahrbuch für das Berg- und Hüttenwesen in Sachsen* (1827), 1–3.

[28] The term "Schematismus" was used for mining almanacs in Austria during the first half of the nineteenth century. See, for instance, Johann Baptist Kraus (ed.), *Allgemeiner montanistischer Schematismus des österreichischen Kaiserthums* (Wien 1842).

[29] See Alexander Wilhelm Köhler (ed.), *Bergmännischer Kalender für das Jahr 1790* (Freyberg and Annaberg [1789]), 26ff. and id. (ed.), *Bergmännischer Kalender für das Jahr 1791* (Freyberg and Annaberg [1790]), 55ff.

Cultural Capital and Social Mobility

While the mining almanac's annual editions, which were published with little interruption since the beginning of the 1770s, provide immediate snapshots of the administrative and social hierarchy of the mining administration, social advancement or upward mobility becomes visible only indirectly by comparing editions over a longer period of time. The following sections of this article will portray these patterns of social order, which are represented in the almanacs both directly and indirectly, for the time between 1766, when teaching at the Saxonian Mining Academy began, and 1868, when the *Direktionsprinzip* was abolished for good. Three arguments structure the following discussion of the connection between professional advancement and education in the Saxonian mining administration over about one hundred years or five generations of mining experts.

First, the connection between social advancement and education suggests that experts had to secure social status mainly through recognition of performance, which is to say that status could not be secured by birth alone. Social historians such as Hartmut Kaelble and Peter Lundgreen have discussed to what degree social mobility was an integral element in developing industrial society. The intention here is to discuss the question of social mobility in the early industrial period, which is widely considered terra incognita in this regard.[30]

Furthermore—and this leads to the *second* aspect—the aforementioned authors portray the transition to industrial society as a process in which the demand for specific occupational groups increased and thus provided increasing opportunities for social advancement or upward social mobility. In the course of the nineteenth century, technical and scientific education became crucially important in the formation of these occupational groups.[31] In this process, it will be argued *thirdly* that (a) the functional differentiation of institutionalized educational opportunities increased, and (b) such opportunities had to be adapted in quantitative terms to the demands that arose from emerging occupational groups. Saxony's mining elite is thus characterized by three aspects: (1) opportunities for

[30] See Hartmut Kaelble, 'Sozialer Aufstieg in Deutschland 1850–1914', *Vierteljahrschrift für Sozial- und Wirtschaftsgeschichte* 60 (1973), 41–71: 43 (note 5). See in general Winfried Schulze, 'Die ständische Gesellschaft des 16./17. Jahrhunderts als Problem von Statik und Dynamik', in id. (ed.), *Ständische Gesellschaft und soziale Mobilität* (München 1988), 1–17: 3, 12 and 16.

[31] See Kaelble 1973 (note 30), 48.

upward social mobility through the recognition of individual performance, (2) the functional differentiation of technical occupations and administrative tasks, and (3) these elites' connection to educational institutions which canonized educational paths and institutionalized what, following Bourdieu's terminology, can be considered "cultural capital".[32]

The sovereign's mining prerogative comprised control and exploitation of the mines, so as to ensure the due levying of contributions, mining jurisdiction, and supervision of the technical side of the mines' operations. Below the ministerial level in Dresden, the mines' technical and economic operations were controlled by state employees in various institutions: the Chief Mining Authority [Oberbergamt], tithe collecting agencies, and local mining authorities [Bergämter]. This type of administrative practice had been recommended by Justi, too, "for the establishment and improvement"[33] of mining. It is known as the *Direktionsprinzip*. From 1710 on, smelting of Saxon silver ore was done by the state through the General Smelting Administration [Generalschmelzadministration], which formed part of the Chief Smelting Authority [Oberhüttenamt]. As Justi and Zimmermann had already pointed out, this priority was based largely on the fact that silver was used as a monetary metal.[34]

In the nineteenth century, however, the *Direktionsprinzip* led to increasing conflicts with individual trades which began to pursue a form of economic activity that was less dependent on the sovereign's directives. Such tendencies were noted, for instance, by Karl Wilhelm Ferber as early as 1807 and by Heinrich Gottlob von Nostiz and Ferber three years later.[35] It was not until the laws of 1851 and, to an even greater extent, 1868 that these contradictions were resolved and Saxony established a liberal organization in its mining economy. This long-term continuity in administrative tasks and structure (leaving aside the founding of the Mining Academy in Freiberg, the centre of the Saxon *Bergstaat*) provides an ideal context for discussing the question of social mobility.

In the last third of the eighteenth century, Saxony's mining elite, i.e. those who performed administrative tasks, numbered about 240 mining

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32 Bourdieu 1983 (note 1), 185 and 190f.

33 Justi 1766 (note 3), 262: "zur Aufnahme und Beförderung".

34 See ibid., 257 and Zimmermann 1746 (note 10), 51.

35 See Guntram Martin, *Bergverfassung, Bergverwaltung, Bergrecht im sächsischen Montanwesen des 19. Jahrhunderts: Probleme des Überganges vom Direktionsprinzip zur freien Unternehmerwirtschaft* (*1831 bis 1868*), dissertation, TU Dresden, 1994, 92f.

experts.[36] At that time, there were about 10,000 miners.[37] While the number of miners remained constant overall, the number of mining experts increased significantly over time. In 1827, for instance, there were 430 mining experts in the administration. For the first 75 years of the time period under consideration here, the number of mining experts in Saxony grew by about a third every 25 years. This remarkable tendency did not slow until the mid-nineteenth century. While income from mining increased for a few years after the Mining Academy was founded,[38] by the turn of the century, the continuous growth in the number of mining experts stood in stark contrast to declining income from mining, as Karl Gustav Adalbert von Weißenbach, inspector of the Mining Academy from 1820 to 1824, stated in 1833.[39] As the number of mining experts increased, so did subsidies for ore mining.

Turning our attention to the educational paths of the mining elite, we see that in 1850, three out of every four of Saxony's mining experts had studied at the Mining Academy. This does not include the shift foremen, whose training took place at the mining schools that had been introduced in Saxony after the founding of the Mining Academy, starting in Freiberg,[40] where the establishment of a mining school was decreed in 1776. It was located in close proximity to the Mining Academy. Some of the Academy's professors taught at the school as well, such as its first director, Johann Friedrich Lempe, who also taught theoretical mine surveying and mathematics at the Mining Academy. While mining schools educated the lower ranks, they also sought to identify particularly talented students, especially in Freiberg. From the end of the eighteenth century on, the Chief Mining Authority strengthened its commitment to promoting talented miners by establishing special classes at the Freiberg Mining School, which prepared students to attend the Mining Academy.[41] The special

[36] The term "mining expert" is used here to refer to all members of Saxony's mining administration mentioned in the mining almanacs.

[37] See Köhler 1789 (note 29), 24f.; id. 1790 (note 29), 28 and Karl Gustav Adalbert von Weissenbach, *Sachsens Bergbau, nationalökonomisch betrachtet* (Freyberg 1833), 21 and 164.

[38] See Baumgärtel 1963 (note 4), 139.

[39] See Weissenbach 1833 (note 37), 130: "Früher waren die reinen Überschüsse des Bergbaues noch bedeutender als jetzt, da er neuerlich einen immer größeren Theil davon als Unterstützung für sein Fortbestehen wieder in Anspruch genommen hat."

[40] For 1797, see WA BAF [Wissenschaftlicher Altbestand Bergakademie Freiberg], NL 161, call number 41, fol. 330b and 332. For 1833, see Weissenbach 1833 (note 37), 159: "die zu Heranziehung von Steigern bestimmten *Bergschulen*".

[41] See A.G. Werner's report of 8 May 1797. WA BAF, NL 161, call number 41, fol. 333f.

role of Freiberg's Mining School in relation to mining schools that were subordinate to other local mining authorities in Saxony corresponded to the new name it was given during the first decade of the nineteenth century: "Main Mining School" [Hauptbergschule].[42] In other mining schools, teaching was often done by the local mining authority's shift foremen. This arrangement guaranteed a focus on practical education.

In the establishment of the Freiberg Mining Academy, spatial proximity to mines and to practitioners was of great importance as well, as the school was intended to provide professional skills for local mining experts and stimulate industriousness in the area. Such concerns also became apparent when the founding of the Mining Academy in 1765 was announced in the *Leipziger Intelligenzblatt* on 9 May 1767. The announcement documented a coin which had been minted for this occasion. Displaying the phrase "For the Encouragement of Industriousness", the coin was to be given as a prize to students at the Mining Academy who submitted "the best essays, plans, models et cetera to the Chief Mining Authority."[43]

Teaching at the Mining Academy began in 1766. Christian Hieronymus Lommer taught mineralogy, Christlieb Ehregott Gellert gave lectures in metallurgical chemistry, and Johann Andreas Klotzsch in assaying. Furthermore, Johann Friedrich Wilhelm von Charpentier taught mathematics, drawing and mechanical engineering, and Carl Ernst Richter taught applied mine surveying. Similar to the tendency observed in the overall personnel structure of the mining administration, the number of professors and teachers employed at the Mining Academy increased between 1766 and 1868 by a factor of three and a half. However, it was not only the teaching staff that increased but also the number of disciplines in which instruction was being offered. If we take the names chosen for courses by instructors as a basis for calculation, the number of disciplines and sub-disciplines grew by a factor of three and a half as well. Chemistry, for instance, became differentiated into metallurgic chemistry and assaying, and then into theoretical, analytical and applied chemistry. Mathematics was sub-divided into higher and applied mathematics. An increased demand for scientific and technical disciplines was also indicated by the

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[42] See Friedrich Gottlob Leonhardi (ed.), *Erdbeschreibung der Churfürstlich- und Herzoglich- Sächsischen Lande* (third edn., Leipzig 1804), vol. 3, 49 and id. (ed.), *Abriß der Erdbeschreibung und Geschichte der Churfürstlich- und Herzoglich-Sächsischen Lande* (Leipzig 1799), 179.

[43] *Leipziger Intelligenzblatt* on 9 May 1767, no. 19, 182–184. See also UAF, OBA, call number 236, fol. 121: "Zur Ermunterung des Fleißes" and "die besten Aufsätze, Risse, Modelle und dergleichen zum Ober-Bergamt-Amt einreichen".

fact that teachers and professors at the Mining Academy often occupied administrative posts within the mining authorities as well. About three in four teaching staff members had such positions, most of them at the middle administrative level, i.e. at the Chief Mining Authority or the Chief Smelting Authority. The majority of teachers and professors at the Mining Academy listed this institution as their own alma mater, further documenting the Academy's importance for Saxony's mining administration.

In order to examine social mobility—in this case among the Mining Academy teaching staff—a model of social stratification is required. The work of Peter Lundgreen, Margret Kraul and Karl Ditt is particularly helpful for this purpose since their model covers the predominant part of the period under consideration here.[44] Lundgreen, Kraul and Ditt base their occupational classification on a six-tier stratification model, which starts with an upper, middle and lower class and sub-divides each of those into an upper and a lower stratum. For the purpose of analysis here, professors are part of the upper stratum of the upper class and lecturers are part of the lower upper class. Comparing the initial stratum, indicated by the father's occupation, with the achieved stratum (that of professors and lecturers, respectively), we see that about three in four Mining Academy teaching staff members are part of the upwardly mobile group and about one in four maintains their social status.[45] This includes the moderate social advancement made by Charpentier, Busse, Breithaupt and Reich, who climbed from lower upper class to upper upper class. Charpentier's father was a captain, Busse's father a superintendent, Reich's a government councillor, and Breithaupt's a chief bailiff and councillor. The group of "class climbers", i.e. those who rose from middle class to upper class, comprises Abraham Gottlob Werner, who climbed from the upper middle class to the lower upper class (his father was an ironworks inspector). Upper upper class status was also achieved by Lampadius, whose father was a first lieutenant and therefore a member of the upper middle class; the brothers Naumann, whose middle class father was a concertmaster in Dresden; Mohs, who came from a merchant family in Gernrode; Karl Friedrich Plattner, whose father was a mechanician and tax collector; and

[44] See Peter Lundgreen, Magret Kraul and Karl Ditt, *Bildungschancen und soziale Mobilität in der städtischen Gesellschaft des 19. Jahrhunderts* (Göttingen 1988), 319–364: "Anhang II Berufklassifikation und Schichtungsmodell".

[45] The data on the Mining Academy's professors and teachers are taken from the *Saxon mining almanacs* and from: *Allgemeine Deutsche Biographie* (Leipzig 1875ff.) and *Neue Deutsche Biographie* (Berlin 1953ff.), as far as they are listed in *ADB* or *NDB*.

Johann Friedrich Lempe, whose father was a contribution collector. In addition, upper class status was achieved by Alexander Wilhelm Köhler, who taught mining law and was a member of the *Leipziger Ökonomische Gesellschaft*. As the headman of a local mining authority, his father had been part of the upper middle class. The group of "extreme climbers", who rose from the lower class to the upper class, consisted of Johann Friedrich Freiesleben and Julius Weisbach, both of whom came from miners' families. Christlieb Ehregott Gellert, Bernhard Cotta, Andreas Heinrich Klotzsch, Johann August Sieghard and Albin Weisbach maintained upper class status. In the majority of these cases, the fathers had already been professors or teachers at the Mining Academy. Bernhard Cotta's father, Johann Heinrich Cotta, was the founder and director of the forestry academy in Tharandt, which had been founded as a forestry school in 1811 and became a state forestry academy in 1816. Albin Weisbach, whose father had been one of the "extreme climbers", maintained the initial status of his parents: Whereas his grandparents were simple miners, as their grandchild, he could claim membership in the upper class in the second generation. In the aforementioned cases, it is apparent that these professors' families succeeded in reproducing their social status. In different strata of the mining administration, we can identify status reproduction processes by means of transgenerational transmission of an occupation or, more concretely, an administrative task, from father to son. In the upper lower class, for instance, Anton Schumann followed his father Carl Gottfried Schumann into the workshop as model maker; within the lower middle class, the contribution collector in the Johanngeorgenstadt mining authority, Gottlob Traugott Gündel, passed on his position (and precise administrative task) to his son Carl Traugott.[46]

Two individual cases, those of Christian Friedrich Brendel and Abraham Gottlob Werner, allow us to illustrate pathways of social mobility within the mining elite in greater detail. Brendel came from a simple miner's family. In the terminology of social stratification we have been using, he was initially a member of the lower lower class. In 1797, after he had attended mining school in Freiberg, his teacher successfully recommended him for the Mining Academy. At the Academy, Brendel specialized in technical equipment for mining. In his second year, he was awarded a

[46] For detailed information on this, see my paper 'Aufstieg und Ausbildung im sächsischen Bergstaat zwischen 1765 und 1868' in the proceedings of the symposium *Staat, Bergbau und Bergakademie: Montanexperten im 18. und frühen 19. Jahrhundert*, held at the University of Freiberg on 22 February 2009 (forthcoming).

small scholarship. Because of the quality of his work, the scholarship was increased in the following years. By accepting the scholarship, Brendel committed himself to a career as a mining official. The transcript kept by the inspector indicates that it was Brendel's persistent success that allowed him to pursue a career as a mining expert. Consequently, Brendel sought employment in mechanical engineering. The scholarship he had been given due to his poverty had opened up an educational opportunity and formed the basis for his radical social climb. However, at least initially, this climb also led to conflicts as his "habitus" was perceived as that of a common miner. For instance, such perceptions surfaced when mining prefect [Oberberghauptmann] von Trebra proposed to hire Brendel for a leadership position in mechanical engineering, a sector that was becoming increasingly important. Older members of the Chief Mining Authority Council [Berghauptmannschaft] such as von Oppel and Charpentier strongly opposed this proposal. As Brendel's advocate von Trebra did not succeed initially, Brendel was sent to England to further his education. In a brief period of time during which von Trebra was absent from Freiberg, the Chief Mining Authority [Oberbergamt] rejected Brendel's request for travel funds, pointing out that he was no more than a *common miner*. In order to achieve recognition on the level of the "habitus", then, institutionalized cultural capital such as a Mining Academy degree was not sufficient; it took the "social capital"[47] of an aristocrat like von Trebra, the mining prefect. In 1811, Brendel became engine master and was given a seat and voting power in all local mining authorities. This administrative position gained greater prominence in 1817, when Brendel was named director of machinery with an own department. From then on, his tasks included the supervision of all machinery in the Royal Black Coal Works and the Meißen Porcelain Manufactory. Remarkably, a new administrative body was established which cut across the mining administration's traditional structures, testifying to the importance of mechanical engineering. These administrative changes can be considered a marker of modernization. They highlight the extent to which scientific and technical knowledge was in demand during the early industrial period. Brendel's social advancement was made possible by this steep increase in demand, which led to the director of machinery gaining in importance and acquiring new responsibilities. In 1846, Brendel received full recognition as a

[47] Bourdieu 1983 (note 1), 185, 188f., 191, 193–197 and id., *Sozialer Sinn: Kritik der theoretischen Vernunft* (Frankfurt/M. 2005), 245.

mining councillor in matters of mechanical and structural engineering and was given a seat and voting power in the Chief Mining Authority.[48]

While Brendel climbed from the lower lower class to the upper middle class, Abraham Gottlob Werner started from a much more privileged position. The son of an ironworks inspector, he was well-positioned for an upwardly mobile career by education. No later than 1770, in his first year studying at the Academy, he became an honorary member of the *Leipziger Ökonomische Gesellschaft*.[49] One year later, Werner graduated from the Mining Academy and went to Leipzig where he attended university until 1774. In February 1775, Werner was appointed inspector of the Mining Academy[50] and a teacher of mining and mineralogy.[51] In support of the appointment, mining prefect Pabst von Ohain stressed the importance of Werner's recent publication *Von den äußerlichen Kennzeichen der Fossilien*.[52] In 1784, Werner became gemstone inspector[53] and eight years later, in March of 1792, a member of the Chief Mining Authority. He was given membership in the scientific academies of Berlin, Moscow, Stockholm and Paris.[54] Overall, Werner's potential to shape Saxony's Mining Academy and the mining administration can hardly be exaggerated. Here, however, we shall focus more specifically on the ways in which his standing in "social space" allowed him to shape or establish knowledge-structuring instruments, "little tools of knowledge"[55] in teaching, research and the mining bureaucracy over a period that comprised about two generations.

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48 See Otfried Wagenbreth, *Christian Friedrich Brendel: Leben und Werk eines bedeutenden Ingenieurs der ersten Hälfte des 19. Jahrhunderts* (Freiberg 2006), 70ff.

49 See Andreas Schöne, 'Die Leipziger ökonomische Sozietät', in Anneliese Klingenberg et al. (eds.), *Sächsische Aufklärung* (Leipzig 2001), 73–91: 83ff.

50 See UAF, OBA, call number 83, fol. 1.

51 See ibid., fol. 21f.

52 See Martin Guntau, *Abraham Gottlob Werner* (Leipzig 1984), 20.

53 See UAF, OBA, call number 85, fol. 58ff., 71f. and 74ff.

54 See Guntau 1984 (note 52), 109ff.

55 See for the discussion Peter Becker and William Clark (eds.), *Little Tools of Knowledge: Historical Essays on Academic and Bureaucratic Practice* (Michigan 2001) and Wolfgang Schild, 'Relationen und Referierkunst: zur Juristenausbildung und zum Strafverfahren um 1790', in Jörg Schönert (ed.), *Erzählte Kriminalität: zur Typologie und Funktion von narrativen Darstellungen in Strafrechtspflege, Publizistik und Literatur zwischen 1770 und 1920* (Tübingen 1991), 159–176: 166f. and 170f.

Little Tools of Knowledge

In arguing for specific training that would allow officials to provide reliable reports and records, cameralists such as Johann Heinrich Gottlob Justi had worked toward successful development of the state's economic affairs.[56] In the Mining Academy, consequently, written reports and records were part of the curriculum early on, especially for the recipients of scholarships, i.e. those students who were to become officials in the mining administration. The Mining Academy's first inspector, Christian Hieronymus Lommer, was commended in the 1771 audit commission's report for the dedication he showed to the state survey of mineral resources. In producing the survey, Academy students were instructed in creating proper reports and records. "In this respect, Lommer has already created enormous benefits by surveying various regions with the Mining Academy students."[57] In the state survey of mineral resources, Lommer was thus already combining teaching, research and reporting for the mining bureaucracy. This allowed him to deflect criticism, which the Chief Mining Authority Council had voiced two and a half years earlier. The Council complained "that the young people attending the Academy take so few actual tests and exams that assess the skills they have acquired in the art of mining."[58] To this criticism, Lommer responded on 23 November 1768, that he would "henceforth, on a set time each Sunday, interview and test all young people about what they have seen, inspected and written down from week to week and collect their weekly papers."[59] Three days later, Lommer's insistence upon instructing students in reporting received the Chief Mining Authority's approval.[60]

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[56] See Johann Heinrich Gottlob von Justi, *Anweisung zu einer guten Deutschen Schreibart und allen in den Geschäften und Rechtssachen vorfallenden schriftlichen Ausarbeitungen, zu welchem Ende allenthalben wohlausgearbeitete Proben und Beyspiele beygefügt werden* (Leipzig 1755).

[57] Baumgärtel 1963 (note 4), 134: "Lommer . . . hat in dieser Absicht schon viel Nutzen geschafft, und mit den Berg-Akademisten verschiedene Gegenden . . . näher untersucht."

[58] UAF, OBA, call number 236, fol. 212: "daß nehml. die anjetzt bey der Academie sich aufhaltenten junge[n] Leute, sowenige Proben und Arbeiten von der in der Bergbaukunst erlangten Fähigkeit ablegen".

[59] Ibid.: "anheischig machen . . . künftig alle Sonntage in festgesetzten Stunden sämtl. junge Leute, in Demjenigen zu befragen u. zu untersuchen, was ein jeder von Woche zu Woche gesehen, befahren, und angemerket hat, und ihre Wochenarbeiten in Anzeigen schriftl. zu übernehmen und zu sammlen".

[60] See ibid., 213.

While written reports were already being taught and collected in Lommer's curriculum, Abraham Gottlob Werner turned them into mandatory tasks that were graded systematically. Apparently five years after Lommer had become headman of the local mining authority in Johanngeorgenstadt, his methods were no longer in use in the Academy. On 13 April 1777, Werner introduced them as if they were new:[61] Students were to write exercises in the form of journals and "Specimina",[62] i.e. thematic course work reports, which could also be used by the Chief Mining Authority for assessing students.[63] These reports were to be handed in before the end of each academic year, before the decisions about scholarships for the following year were made.[64] This practice was intended to ensure that those who were able to provide systematic written reports could take the career path of mining officials. Werner's announcement included some new elements: the link between the reports and the completion of an academic year, their role in awarding scholarships, and also the practice of increasing the scope of students' reports each year, leading up to a report about a mine's complete operations. Werner's suggestions were implemented by a sovereign's rescript a month later.[65] Support for scholarship recipients, i.e. the future officials in the mining sector, was once again on the agenda of the Chief Mining Authority at an academic conference of 3 October 1785. Mining Academy inspector Werner and Professor Johann Friedrich Lempe presented their examination of students' journals. Werner emphasised "that all scholarship holders . . . showed poor results in orthography; that he recently looked after this when revising their journals and that he would continue to do so; that he, moreover, recommended one major focus of attention on orthography in the future when revising all their

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[61] See Walter Schellhas, 'Abraham Gottlob Werner als Inspektor der Bergakademie Freiberg und als Mitglied des sächsischen Oberbergamts zu Freiberg', in *Abraham Gottlob Werner* (Leipzig 1967), 245–278: 248.

[62] UAF, OBA, call number 8R, fol. 47. See also ibid., call number 10, fol. 239 and WA BAF, NL 161, call number 41, fol. 6 and 13b.

[63] Additionally, scholarship holders were to write decent reports, i.e. "besondre Fahrbücher . . .; in welche sie kurze Bemerkungen über jede ihrer gemachten Befahrungen einschreiben". UAF OBA, call number 10, fol. 239.

[64] See UAF, OBA, call number 8R, fol. 47 and ibid., call number 26, fol. 70ff. and ibid., call number 241, fol. 191.

[65] See Schellhas 1967 (note 61), 248 and Horst Gerhardt, 'Abraham G. Werner, der Bergbau und F.W.H. von Trebra', in Helmuth Albrecht and Roland Ladwig (eds.), *Abraham Gottlob Werner und die Begründung der Geowissenschaften: Ausgewählte Vorträge des Internationalen Werner-Symposiums vom 19. bis 24. September 1999* (Freiberg 2002), 64–72: 69f.

assessment papers."[66] Werner's suggestion "was recommended to both teachers", Alexander Wilhelm Köhler stated in his minutes.[67] It was Köhler who was going to provide a practical "seminar on the German language."[68] According to Werner's March 1795 report "on the Mining Academy's previous success, including proposals for its improvement",[69] the German language class was to be split up into two closely coordinated courses, "schooling in German language" and "instruction in the regular composition of the most common types of mining reports."[70] The rationale given by Werner for the latter course makes it particularly clear that the main aim of Academy officials was to qualify students for the reporting system within Saxony's mining administration:[71] "It is certain that many of our officials lack the skills and knowledge necessary to write various types of mining reports in accordance with formal requirements, so that many of them are unsuitable for higher service in the administration."[72] He continued: "In my view, the main requirements of a good business writing style are—apart from the formal requirements—completeness, definiteness, orderliness, comprehensibility, coherence, purposefulness, brevity, clarity and decency, which may be completed by a harmonious sound."[73] In Werner's presentation of 3 October 1785, it is already apparent that he wanted to develop a system of written reports that would make use of bureaucratic instruments in order to bridge spatial distances within the

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66 UAF, OBA, call number 25, fol. 8b f.: "daß sämtliche Stipendiaten sehr, doch immer einer mehr als der andere in der Orthographie zurück wären, und daß er daher bereits bey dießmaliger Durchgehung der Tagebücher Rücksicht darauf genommen hätte, und auch künftig weiter nehmen würde, übrigens aber dafür hielte, daß es nöthig seyn dürfte für … künftige bey Durchgehung aller ihre[r] schriftlichen Arbeiten die Rechtschreibung mit zu einem Hauptaugenmerk zu nehmen".

67 Ibid., fol. 9.

68 Ibid., fol. 134f. See also UAF, OBA, call number 10, fol. 185 and 188b.

69 Ibid., fol. 56: "über den bisherigen Erfolg der hiesichen [sic] Bergakademie samt ohnmaßgeblichen Vorschlägen zu deren Verbesserung".

70 Ibid., fol. 186: "gleich vom Anfange her … mit diesem Unterrichte bezielt worden [waren]: nämlich Unterweisung in deutschem Stile und Anweisung zu regelmäßiger Abfassung der gewöhnlichsten bergmännischen Geschäftsberichten".

71 For 1797/98, see UAF, OBA, call number 257, fol. 15ff., in particular 19b. For 1816/17, see UAF, OBA, call number 275: "Übersicht der Vorlesungen für das akademische Jahr".

72 UAF, OBA, call number 10, fol. 186b f.: "Es ist ferner gewis, daß es vielen von unsern Offizianten und Beamten an der Kentnis der formellen Einrichtung der verschiedenen Arten von bergmännischen Geschäftsberichten, und an Fertigkeit solche abzufassen fehlt: so daß viele deswegen nicht zu höheren Diensten gebraucht werden können".

73 Ibid., fol. 189b: "Haupt-Erfordernisse eines guten Geschäfts-Stils sind, nach meinem Erachten—außer dem nöthichen Formellen,—Volständigkeit, Bestimtheit, Ordnung, Verständlichkeit, Zusammenhang, Planheit, Kürze, Reinheit und Anständigkeit; wozu höchstens noch Wohlklang".

Bergstaat. According to this plan, future officials would be sent to "outlying mines."[74] A highly detailed plan for students' written reports would be created, characterized by increasing complexity and difficulty, so that each would be "instructed from time to time, preferably once a month, about what he is to do in the assigned mine."[75] Werner provided a system for students' reporting containing sixteen elements: First, a description of mountains and tunnels; second, previous history of the mine's and neighbouring mines' operations; third, existing premises of the mine; fourth, getters' work; fifth, timbering and walls; sixth, output; seventh, mine air and ventilation; eighth, machinery and ground-water lowering; ninth, ore dressing; tenth, supply of driving water and suggestions for further measures; eleventh, the pit foreman's daily tasks; twelfth, the mine's supervision by officials and superintendents; thirteenth, accounting; fourteenth, materials administration; fifteenth, ore transport, sixteenth, assessment of the overall condition and value of the mine. Abraham Gottlob Werner's 1786 report states that in December 1785, the Mining Academy inspector established a specific curricular unit, the "Elaboratorium",[76] which was intended for "scholarship holders whose curriculum is drawing to a close and who should thus become more familiar with the practical side of structural engineering."[77] The *Elaboratorium* was intended for them to be trained in

> inspecting and describing the mining premises more orderly, precisely and clearly than they were previously accustomed to.... To this end, a particular part of the mining machinery, of a mine's bookkeeping or of its premises are to be studied, inspected and described in the Elaboratorio every month; for this purpose, a draft plan will be provided and explained to them beforehand. The essays they produce are to be continuously revised during the composition process and after they are finished. In this process, I also have

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74 UAF, OBA, call number 25, fol. 20.

75 Ibid.: "jedem von Zeit zu Zeit, und zwar am besten monathlich, vorzuschreiben, womit er sich auf dem ihm angewiesenen Gruben-Gebäude eigentlich beschäftigen soll."

76 UAF, OBA, call number 246, fol. 139 and 141b f. In his report for the Chief Mining Authority of 28 July 1818, Johann Carl Freiesleben dates the beginning of Werner's *Elaboratorium* to the academic year 1777/78. See UAF, OBA, call number 277, fol. 91b and ibid., fol. 94 and 99b. The same date is mentioned in Werner's announcement of a "practical seminar" [praktisches Ausarbeitungs-Kollegium], see UAF, OBA, call number 8R, fol. 46 and see ibid., call number 241, fol. 189b.

77 UAF, OBA, call number 246, fol. 139: "Stipendiaten, deren akademischer Kurs ziemlich zu Ende gehet, und die also deswegen mehr ins praktische der Bergbaukunst hineingeführt werden sollen, eine ordentlichere genauere und bestimmtere Betrachtung und Beschreibung der Gruben-Gebäude, als bei ihnen bisher gewöhnlich gewesen ist".

> the opportunity to recapitulate important units from the lectures on mining. . . . Furthermore, I focus on German orthography and writing style.[78]

Werner's typology of reporting tasks directly prepared scholarship recipients for the tasks that awaited them in the mining bureaucracy. They were taught to take a highly complex company such as a mine and break it down analytically into single reporting entities. He did this because he had noted that "they do as well as they can, but they do not follow a plan and are not able to do so: because, firstly, they are not capable of understanding the entirety of their task; secondly, most of them are not talented enough to draft and carry out a systematic plan for their work."[79] Werner's educational goal was to teach future mining officials how to turn complex objects and labour processes into clearly written reports and to reduce these processes to simpler tasks within an overall division of labour. Scholarship holders were expected to report about single elements as they related to the larger whole, following a systematic plan, for instance in mining premises in the Ore Mountains of Saxony.[80] As Werner's statements at the academic conference on 3 October 1785 documented, this required instruction in good use of the German language.[81] An instructional material for all "written elaborations in business and legal matters"[82] had been authored in 1755 by Justi, an author whose work Werner was familiar with. In the Academy, "teaching in grammar . . . [and] business writing"[83] was introduced for mining administration scholarship

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[78] Ibid., fol. 139f.: "Es wird selbigen zu diesem Ende in solchen Elaboratorio jeden Monat ein besonders Stück, entweder der Berg-Technik oder des Grubenhaushalts eines Gruben-Gebäudes zu betrachten, zu untersuchen und zu beschreiben aufgegeben, wozu ihnen nicht allein vorher ein Plan entworfen und erkläret, sondern auch ihr nachher gefertigter Aufsatz sowohl während der Ausarbeitung als nach seiner Vollendung durchgesehen und korrigirt wird. Hierbei habe ich die beste Gelegenheit manchen wichtigen Satz aus den Vorlesungen über den Bergbau mit ihnen zu repetiren . . . Auch nehme ich dabei zugleich Rücksicht auf deutsche Schreibart und Stil."

[79] UAF, OBA, call number 25, fol. 20: "sich zwar, so guth als ihnen möglich, beschäftigen, doch aber nach keinen Plan arbeiten und zu arbeiten im Stande sind: weil sie, eines theils das Ganze, womit sie sich beschäftigen sollen, nicht zu übersehn vermögen, zweitens auch die meisten, sich einen sistematischen Plan über ihre Beschäftigungen zu entwerfen und solchen theilweise zu bearbeiten, nicht Talent genug haben".

[80] On the relevance of this kind of cameralist knowledge for the Bergstaat, see the recent work by Andre Wakefield, *The Disordered Police State: German Cameralism as Science and Practice* (Chicago 2009), 34–44.

[81] See UAF, OBA, call number 25, fol. 22b.

[82] Justi 1755 (note 56).

[83] UAF OBA, call number 277, fol. 91b: "Grammaticalischer Unterricht . . . [und] ein Unterricht in Geschäftsstyl".

holders. Justi had demanded that "a written essay should in its order and through its essential segments" fulfil the

> purpose of sharing our thoughts with our fellow men and convincing them of the truth and legitimacy of a particular cause. In any kind of business, this purpose is evident: Because either we seek and ask for something and should thus prove our request's legitimacy and equitableness; or, we report something or give advice, an expert opinion, a decision and a judgement; and here as well, we are to present convincingly the truth and validity of our thought.[84]

Justi went on to provide some relevant definitions:

> Reports or relations are written narrations or information given by servants to their superiors informing them about the performance of their official duties. These reports are to be presented to the superiors either in order to obtain further instructions or because they are demanded through rescripts or decrees. Obviously, then, the language of these reports must be devoid of opulent wording and precious expressions. One should avoid unnecessary digressions and meanderings because nothing is required but reporting the cause briefly, clearly and naturally, but without missing essential information. For this purpose, one best uses the past tense; the reports should be provided as formal letters, which servants owe to their superiors, taking into account the superiors' rank and the degree to which they rank higher than the person reporting.[85]

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[84] Justi 1755 (note 56), 138f.: "[v]on der Ordnung und den wesentlichen Theilen eines jeden schriftlichen Aufsatze" and "haben den Endzweck, daß wir unsern Nebenmenschen unsre Gedanken mittheilen, und dieselben von der Wahrheit und Rechtmäßigkeit einer gewissen Sache überzeugen wollen. In allen Geschäften leuchtet dieser Endzweck von selbst hervor: Denn entweder wir suchen oder bitten etwas, und alsdenn ist es nöthig, die Rechtmäßigkeit und Billigkeit unsrer Gesuche zu zeigen, oder wir berichten etwas oder geben Rath, Gutachten, Entscheidung und Urtheil von einer Sache zu erkennen, und auch hier müssen wir die Wahrheit und Gültigkeit unsrer Gedanken deutlich vorzustellen und überzeugend darzuthun wissen."

[85] Ibid., 273: "Berichte oder Relationen sind schriftliche Erzehlungen oder Nachrichten derer Bedienten an ihre Obern, von denen in ihren Amtsverrichtungen vorfallenden Angelegenheiten und Sachen, welche entweder denen Obern vorgestellt werden müssen, um ihre Befehle einzuholen, oder welche sie vermittelst ergangener Rescripte oder Decrete zu wissen verlanget haben. Man sieht also leicht, daß die Schreibart darinnen ohne prächtige Worte und gekünstelte Ausdrücke seyn muß, und daß man sich vor allen unnöthigen Umschreibungen und Weitläufigkeiten zu hüten, weil hier nichts erfordert wird als die Sache kurz; deutlich und natürlich, jedoch ohne Auslassung der wesentlichen Umstände, vorzustellen. Dennhero kann man sich der historischen Schreibart am besten bedienen, die jedoch in die Briefform eingekleidet seyn muß, welche Untergebene ihren Obern schuldig sind, wobey aber auf den Stand der Obern, und ob sie weit über demjenigen, so den Bericht erstattet, erhaben sind, alerding zu sehen ist."

In his instructions, Justi insisted that reports be clear and brief. Clarity and brevity are indispensable virtues for the maintenance of an efficient administration. Furthermore, however, he also insisted that the hierarchical relationship between the official writing the report and the superior who received the report be adhered to and, therefore, confirmed in the process.[86] Such reports and the relationships they represented, then, should be seen as expressions of the social order: They related the reporting official and the report's higher-up recipient hierarchically, and they demanded that both officials, in accordance with their status within the state and the mining administration, profess appropriate reverence and respect for one another, that is, adhere to a code of deference and honour.

Werner was relieved of many of his tasks by the sovereign's rescript on 24 October 1797. He was no longer in charge of the weekly review and revision of scholarship recipients' journals,[87] but he continued to be responsible for the correction of their *Specimina* in the *Elaboratorium*.[88] His teaching methods, moreover, were held in high regard long after his death in 1817. Werner's successor in mining, Carl Amandus Kühn, was often compared unfavourably to the standard set by Werner,[89] especially when it came to the latter's ability to get students to follow the formalized reporting system he had introduced. As late as 1834, Kühn admitted he did not possess Werner's ability in this regard.[90] Freiesleben, assessor at the Chief Mining Authority, noted that Werner's successor in the Academy did not handle the teaching tasks in the way Werner had done. In a review for the Chief Mining Authority, Freiesleben complained that successful instruction would require a return to "the Wernerian manner".[91] Long after his death, "the Wernerian manner" continued to represent a tool of knowledge for the mining bureaucracy and its teaching practice. Similar evaluations can be made of Werner's role in developing a formal system for the geognostic field mapping of Saxony. When timber was in short supply in the late eighteenth century, the state asked for maps that would record natural resources. The supply crisis had particularly negative effects on mining and smelting, as Justi had already foreseen in the middle of the eighteenth century. Justi had suggested that a successful

[86] See also Werner's approach: UAF, OBA, call number 10, fol. 189b–190b.
[87] See UAF, OBA call number 85, fol. 86ff.
[88] See UAF, OBA, call number 277, fol. 92b und 99b.
[89] See UAF, OBA, call number 276, fol. 42f.
[90] See UAF, OBA, call number 293, fol. 73f.
[91] UAF, OBA, call number 277, fol. 94: "nur auf die Wernersche Art behandelt werden".

state economy required setting timber prices in a way that gave priority to the needs of the mining sector.[92] While research on strategies for afforestation was conducted, for instance, by the aforementioned forestry school in Tharandt, an exploration of coal deposits was of even greater importance. This project led to a large-scale geognostic field mapping project, the *geognostische Landesuntersuchung*. For the purpose of the *Landesuntersuchung*, Saxony was systematically divided up into about one hundred districts. In distributing the tasks of surveying and mapping within the administration, geographical aspects and questions of organizing the labour process were taken into account. District sizes varied depending on terrain, since mountainous areas would take more time to survey than the plains, and all districts were expected to provide reports after six to eight weeks. By the time the field mapping project issued its first progress report in 1811, 20 years had passed. In the course of this project, Werner instructed a large number of scholarship holders. First, they had to chronologically record their observations (journal), then they had to systematically combine their results according to given sets of questions, and finally they had to transfer these results onto a map that was to be coded according to Werner's system of colours and symbols.[93] Among the scholarship recipients who were trained in Werner's field mapping, many pursued prominent careers in mining administration such as the future mining professor Kühn, the future Chief Mining Authority Council member Freiesleben, mineralogy professor Breithaupt, mining law professor Lehmann, Mining Academy inspectors von Weißenbach and Gustav Ludwig Ferdinand Köhler, director of machinery Brendel, mining prefect von Herder, as well as von Hardenberg, better known under his pen name, Novalis.[94] Werner's case, then, illustrates the ways in which one single, powerful person could decisively shape the academic and bureaucratic field of Saxony's mining administration, designing the "little tools of knowledge", i.e. the codification of knowledge itself.

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[92] See Justi 1766 (note 3), 267f.; see for the discussion Joachim Radkau, *Holz—Wie ein Naturstoff Geschichte schreibt* (München 2007), 150ff. and Bernd-Stefan Grewe, *Der versperrte Wald: Ressourcenmangel in der bayerischen Pfalz (1814–1870)* (Köln 2004), 26–33.

[93] See Schellhas 1967 (note 61), 265ff.

[94] See Otfried Wagenbreth, 'Abraham Gottlob Werner und seine Bedeutung für die Entwicklung der geologischen Landesaufnahme und des geologischen Kartenwesens', *Zeitschrift für angewandte Geologie* 7 (1967), 372–384: 378ff.

Showing Status and Guiding Actions: Conclusion

When the Mining Academy started enrolling students in 1766, the rules governing the social order of Saxony's mining administration *Bergstaat* slowly began to change. These rules could be taught, learned and controlled. Specialized education and training for mining officials provided these cohorts of individuals with new opportunities for social advancement and caused a gradual re-adjustment of their "habitus", which was also subject to new official regulations.

Newly institutionalized educational degrees and the examination system which the Mining Academy introduced in the late eighteenth century shaped "mining sciences" knowledge relevant for mining experts. This included the "physical, natural historical, technical and cameralist sciences", as von Weißenbach, a former inspector of the Mining Academy, put it in 1833.[95] Reporting skills formed an important part of this knowledge, particularly for scholarship holders, i.e. those students who had been selected as future state officials. They were to be provided with "knowledge that is necessary in order to write the various types of mining reports in accordance with formal requirements."[96] These requirements concerned

> petitions, announcements and memos, extracts from writings and files, repertories, reports including mining journals and mining reports, registries, regulations … written narrations, amicable letters, letters of recommendation, receipts, certificates, descent forms … [and] mine's inventories, as they are either filed in the registry or given to the contribution collector.[97]

Different types of mining reports required different types of deference, as a comparison between amicable letters or recommendation letters on the one hand and receipts or descent forms on the other hand shows. Hence, the requirements that Werner expected students to meet included moral

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[95] Weissenbach 1833 (note 37), 102: "physikalischen, naturhistorischen, technischen und kameralistischen Wissenschaften".

[96] UAF, OBA, call number 10, fol. 186b f.: "Kentnis der formellen Einrichtung der verschiedenen Arten von bergmännischen Geschäftsberichten".

[97] UAF, OBA, call number 10, fol. 190f.: "Supliken, Anzeigen und Promemorias, Auszügen aus Schriften und Akten, Repertorien, Berichten samt Fahr- und Grubenberichten, Registraturen, und Verordnungen … schriftliche Erzählungen, freundschaftliche Briefe, und Wohlstands- und Empfehlungs- Schreiben … [sowie] Quittungen, Attestate, Fahrbögen, … [und] Gruben-Aufstände, wie sie theils den Einlage-Registern angehängt, theils den Zubusbothen mitgegeben werden" (emphases deleted).

aptitude, decorousness and character,[98] and "decency".[99] 500 copies of Werner's code of conduct for scholarship holders were printed in October of 1795. This code emphasized that "moral education is the second main purpose of mining training after scientific 'culture'."[100] Therefore,

> all scholarship holders [are urged] to take care of their outward appearance, to keep themselves as clean as possible, but to avoid any pretentiousness in clothing, hairstyle et cetera, to conduct their bodies decently and to adopt a well-mannered kind of language. . . . Also, every scholarship holder is to behave politely and modestly to everybody as well as to his superior and to the mining officials in particular.[101]

By making social knowledge explicit, these directives for "befitting conduct" guided social practice, down to an individual's bodily demeanour. Mining uniform regulations provide another example of the ways in which social knowledge was made explicit. At the beginning of his code of conduct for scholarship holders, Werner insisted that future mining officials had to meet their superiors in mining uniform, i.e. "in accordance with the regulations set by the Chief Mining Authority."[102] The image of an academy student shown in the mining almanac published by Alexander Wilhelm Köhler was also a scholarship holder. In contrast, "natives and non-natives attending the Academy at their own expense" were not subject to the uniform code.[103] They were not part of the symbolic order of the mining administration the uniforms represented. According to the uniform code of 1769, the teachers and professors at the Mining Academy were set apart from the scholarship students only "by a more opulent

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[98] See WA BAF, NL 161, call number 41, fol. 204ff. and UAF, OBA, call number 26, fol. 69f.

[99] UAF, OBA, call number 10, fol. 189b.

[100] UAF, OBA, call number 26, fol. 72b: "nächst der wissenschaftlichen Cultur die sittliche Ausbildung der zweyte Hauptgegenstand der bergakademischen Erziehung".

[101] Ibid., fol. 72b f.: "sämtliche Beneficiaten [sind angehalten] sich eine gute äusere Bildung angelegen seyn zu lassen, und vorzüglich sich so reinlich als möglich zu halten, jedoch alle Affektion in Kleidung, Frisur und dergleichen zu vermeiden, auch sich übrigens zu gewöhnen, seinen Körper anständig zu tragen, und sich einer guten und gesitteten Sprache zu befleißigen. . . . Auch hat jeder Beneficiat ein höfliches und bescheidenes Betragen gegen jedermann, besonders aber gegen seine Vorgesetzten, so wie gegen die Berg- und Hüttenbeamten . . . zu beachten."

[102] UAF, OBA, call number 26, fol. 69f.: "nach der vom Oberbergamte festgesetzten Vorschrift". On university dress codes in the early modern period, see Marian Füssel, *Gelehrtenkultur als symbolische Praxis: Rang, Ritual und Konflik an der Universität der Frühen Neuzeit* (Darmstadt 2006), 101f.

[103] Köhler 1790 (note 29), 56: "Inländer und Fremde, welche für ihr Geld die Academie frequentieren, sind zu keiner Uniform verbunden."

border, double epaulettes, cab peaks and sabre."[104] This symbolic order structured social space and was continuously re-structured by the actions of individuals within it. If the symbolic distinctions that constituted this order were breached, there were legal ramifications for the offender. Uniform regulations and marching formations during miners' parades allowed for representations of rank and estate and enabled a particular configuration *showing status and guiding actions*.[105]

At the same time, within the social order of Saxony's mining administration, mining experts had to prove their competence through their professional knowledge. "Mining knowledge" provided mining experts with cultural capital. The amount of capital depended on the type of institution that awarded the degree, the Mining Academy, or regular mining schools. Accordingly, graduates were positioned within the mining administration's social hierarchy. Some graduates went on to pursue legal degrees, for instance at the University of Leipzig, after having studied at mining institutions.

Education was a crucial factor in the social advancement of mining experts, possibly *the* most crucial factor, as the transgenerational comparison of Mining Academy teaching staff members revealed. As future officials in the mining authorities, scholarship holders were subjected to particular admission and examination procedures. Trained specifically for tasks in the mining administration, scholarship holders exemplified the dovetailing of the Academy and Saxony's *Bergstaat*.

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[104] Ibid., 57f.: "nur durch reichere Bordirung, durch doppelte Epeaulets [sic] und Mützenschilde, und Säbel".

[105] See Gunter Gebauer and Christoph Wulf, 'Soziale Mimesis', in Christoph Wulf, Dietmar Kamper and Hans Ulrich Gumbrecht (eds.), *Ethik der Ästhetik* (Berlin 1994), 75–84: 77f. See also Gunter Gebauer and Christoph Wulf, 'Zeitmimesis', in Gunter Gebauer and Christoph Wulf (eds.), *Praxis und Ästhetik: Neue Perspektiven im Denken Pierre Bourdieus* (Frankfurt/M. 1993), 292–316: 300 and 302.

SCIENTIFIC "PATRIOTISM" BETWEEN SELF-IMPORTANCE, SELF-RECOMMENDATION AND CAMOUFLAGE. THE ENLIGHTENMENT REQUIREMENT OF PUBLIC BENEFIT AS REFLECTED IN THE TITLE PAGES AND PREFACES OF POPULAR WORKS BY SCHOLARS

Reinhart Siegert

Introduction[1]

The popularisation of knowledge as an Enlightenment requirement from scholars is well known; the highly influential figure of Christian Wolff stands as the exemplary proponent within the German-speaking world.[2] An essential aspect of the Enlightenment can be seen in the way scholars became active proponents of the public good, in their "patriotism", as understood in that context. My contribution will look at the title pages and prefaces of popular works by scholarly authors as a new reflection of this aspect of a characteristic contemporary theme.[3]

I shall divide my contribution into two aspects: 1. indirect, with an investigation of what title pages reveal of the figure of the scholar in the eighteenth century. The spectrum ranges from anonymity to 24 long lines of information about the author. 2. direct: what ethos is reflected in the prefaces of popular works by scholarly authors? For it is the case that many authors present their works explicitly in an Enlightenment frame.

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[1] Kindly translated by David Paisey.—A parallel version has appeared in German language: Reinhart Siegert, 'Der gemeinnützige Autor der Aufklärung im Spiegel der Paratexte. Mit einem Anhang: Die zitierten Paratexte im Wortlaut', in Werner Greiling and Franziska Schulz (eds.), *Vom Autor zum Publikum. Kommunikation und Ideenzirkulation um 1800* (Bremen 2010), 333–364. Both versions are identical as regards content except the different introduction and the appendix, which appears in the German version only.

[2] On this subject, see for example my so far unpublished chapter 'Volksaufklärung' [Popular Enlightenment] for the *Grundriss der Geschichte der Philosophie*, founded by Friedrich Ueberweg, vol. 3: *Das Heilige Römische Reich Deutscher Nation—Die Eidgenossenschaft*, ed. by. Helmut Holzhey (new edn., Basel, forthcoming).

[3] Title pages and prefaces are part of the framework of the main text of a book. Gérard Genette has propagated the term of "Paratext" for this framework which contains as well the title, mottoes, dedications, a table of contents, illustrations and so on. Paratexts are of interest because of their influence on the reading of the main text. Cf. e.g. the concise overview by Burkhard Moennighoff in *Reallexikon der deutschen Literaturwissenschaft* (Berlin and New York 2003), vol. 3, 22–23.

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This is new territory: I know of no previous examination of the figure of the scholar on title pages; and, while the secondary literature has naturally examined what prefaces tell us in certain interesting cases, I do not know of any more generalised study. The reason is probably that it is very difficult to assemble a representative number of examples. However, I have had access to a broad supply of sources in the form of entries in the database "Volksaufklärung (VA)" [Popular Enlightenment], the basis of the joint Böning/Siegert project[4] and the central topic of my research. I have the supporting evidence of over 3,000 recorded personal descriptions and 1,800 prefaces I have read from works of the Popular Enlightenment.

I should record that these works are naturally a selection from those actually produced, albeit a large selection covering practically all subject areas. But since our database includes not only works "for the people", but also the whole meta-communication between the scholarly producers themselves, the part played by scholarly authors is considerable. The circle of real specialist scholars is however far smaller than that of educated people in general, also in the realms of theory and of absolutely outstanding achievements. And this division must be handled with care in the eighteenth century: cross-over was more fluid than today, and border incursions that much more fascinating.

Plain facts can easily give rise to questions. Let us take an example: J.G. Hübner's Thoughts on the best way of eliminating harmful caterpillars (fig. 1).[5] What persuades an Imperial Public Notary (as he describes himself) to write a brochure about pest control, why does he address himself to "farmers", and why does he print his professional qualifications on the title page in Latin?

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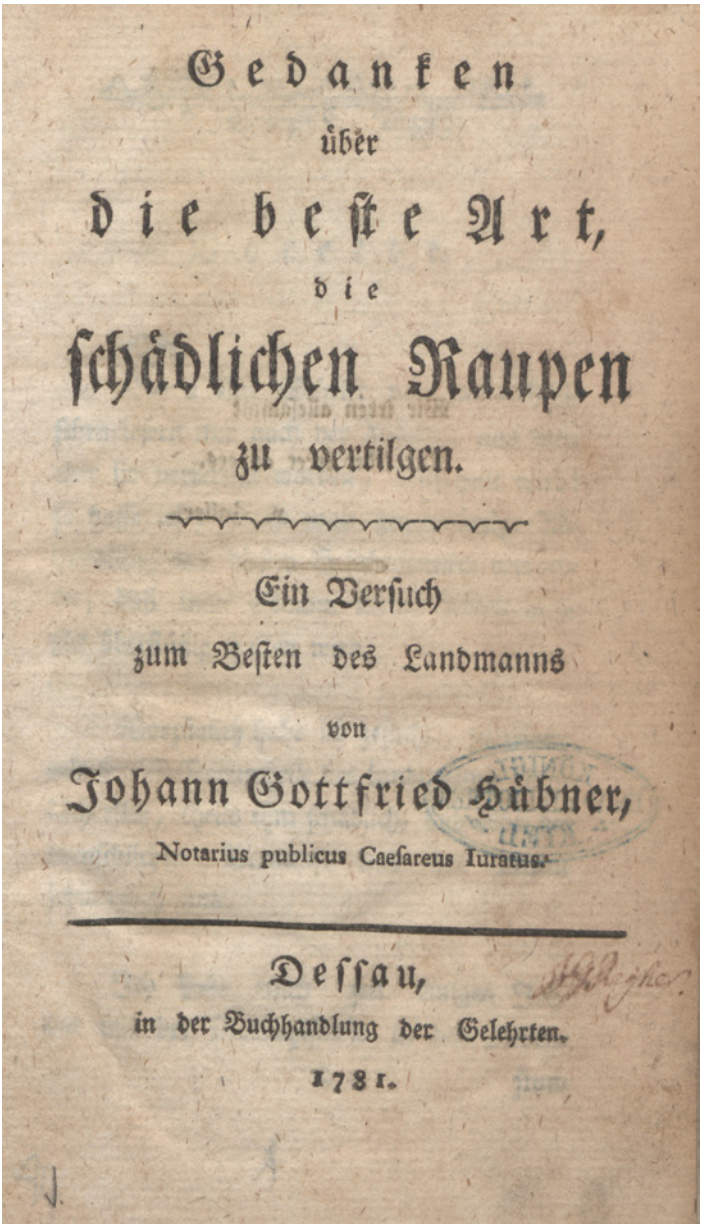
[4] Holger Böning and Reinhart Siegert, *Volksaufklärung. Biobibliographisches Handbuch zur Popularisierung aufklärerischen Denkens im deutschen Sprachraum von den Anfängen bis 1850* (Stuttgart-Bad Cannstadt 1990ff.), 4 vols. [abbreviated *VA*; vol. 1 1990, vols. 2.1 and 2.2 2001]. Titles identified and described there are cited here in abbreviated form with the volume and running number of the Handbuch, for example "*VA* 2.1/1588". Because it is possible to give abbreviated references in this way I favour text examples from the period already covered in printed form (i.e. before 1800); the preparation of titles from the nineteenth century is however already far advanced. Titles not described in *VA* 1 and *VA* 2 are cited as short titles; a list of short titles and the wording of the personal details form an appendix to the German parallel version of my contribution (see note 1).

[5] Johann Gottfried Hübner, *Gedanken über die beste Art, die schädlichen Raupen zu vertilgen* (Dessau 1781).


Gedanken
über
die beste Art,
die
schädlichen Raupen
zu vertilgen.

Ein Versuch
zum Besten des Landmanns
von
Johann Gottfried Hübner,
Notarius publicus Caesareus Iuratus.

Dessau,
in der Buchhandlung der Gelehrten.
1781.

Fig. 1. Johann Gottfried Hübner, *Gedanken über die beste Art, die schädlichen Raupen zu vertilgen. Ein Versuch zum Besten des Landmanns* (Dessau 1781), title page. Kiel University Library.

Thus an especially interesting and unresearched piece of the history of science demands investigation from the inside.

The Different Ways in Which Authors Present Themselves

Some Figures

Let us begin with some figures. Of the approximately 19,000 titles provided for this subject by the "Popular Enlightenment" database,[6] nearly two-thirds[7] were published with the author's usual name on the title page.[8] Only one per cent each appeared with a pseudonym[9] or a hidden naming of the author, for instance at the end of the preface or of the main text.[10] A good third appeared anonymously,[11] counting both monographs and articles in periodicals.

Anonyma and Their Implications

This high proportion of anonyma[12] is an eighteenth-century speciality. A big project to evaluate learned journals and newspapers as networks for knowledge in the Age of Enlightenment speaks of "the anonymity principle",[13] to be observed in enlightenment writings, and Paul Raabe, in his essay "Pseudonymous and anonymous works in the 17th and

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[6] There are 17,568 independent and 1,482 subordinate titles; for technical reasons, 2,216 periodicals (journals and periodical calendars *in toto*) and Bibles are not included in the figures; in a very few cases they have been drawn on for examples of special personal details.

[7] 11,972 = 62.8 per cent.

[8] Or in periodical articles, with the authors' names at the end or in tables of contents or on wrappers; to differentiate here between the various usages seemed to me not to illuminate our theme.

[9] 231 pseudonymous titles = 1.2 per cent; in 107 = 46.3 per cent of these it was possible to establish the true author.

[10] 243 titles with hidden authors' names = 1.3 per cent.

[11] 6,616 titles = 34.7 per cent. Cryptonyms, like the abbreviations such as "by S**ng" found in annual anthologies, have been counted as anonyma; but they occur very seldom in the kind of texts considered here, and seem to have been more of a playful custom with Anacreontic poets.

[12] Cf. Jan-Dirk Müller, 'Anonymität', in *Reallexikon der deutschen Literaturwissenschaft* (Berlin and New York 1997), vol. 1, 89–92; Carl Diesch, 'Anonymität', in *Reallexikon der deutschen Literaturgeschichte*, founded by Paul Merker and Wolfgang Stammler (second edn., Berlin 1958), vol. 1, 66–68. Further references there.

[13] Application to the Akademie, Göttingen 2008.

18th centuries", says: "It seems to me that the publication of anonymous works in Germany reached its apogee around 1800".[14] He notes this in relation to censorship, "the word in chains and at liberty in Europe",[15] and refers to politically offensive material and erotica; but some other dynamic must underlie anonymity in instructions for growing clover and "sermons for village people". Johann Georg Meusel, whose work *Gelehrtes Teutschland* provides us with the most extensive contemporary information about authors, systematised this striking phenomenon of the time in a partly ironic digital pattern of justification, which is also very sensible (fig. 2):[16]

Writers are anonymous
1 either completely and
  1.1 either for good reasons
    1.1.1 either out of clear conscience
      1.1.1.1 either from noble motives, in order to say salutary truths, which, were they to give their names, would make them liable to unpleasantness
      1.1.1.2 or in order not to distort the opinions of the public and the critics by giving their names
    1.1.2 or out of a guilty conscience
      1.1.2.1 either to damage the state, religion and morals
      1.1.2.2 or to insult and pursue individuals
      1.1.2.3 or out of concern that their works might be badly received because of their unknown or bad name
  1.2 or for bad reasons
    1.2.1 either physical (hypochondria, melancholy, flatulence etc. etc.)
    1.2.2 or moral
      1.2.2.1 either from modesty
        1.2.2.1.1 either genuine
        1.2.2.2.2 or false
      1.2.2.2 or from caprice
2 or half, in that their names do not appear on their title pages, but are deployed after the dedications or prefaces, or in an acrostic.

[14] Paul Raabe, 'Pseudonyme und anonyme Schriften im 17. und 18. Jh.', in *Der Zensur zum Trotz. Das gefesselte Wort und die Freiheit in Europa* (Weinheim 1991), 53–66.

[15] Cf. his subtitle.

[16] In *Das Gelehrte Teutschland oder Lexikon der jetzt lebenden Teutschen Schriftsteller. Angefangen von Georg Christoph Hamberger, fortgesetzt von Johann Georg Meusel* (reprint of the fifth expanded and revised Lemgo 1806 edn., Hildesheim 1966), LXXXV (a table).

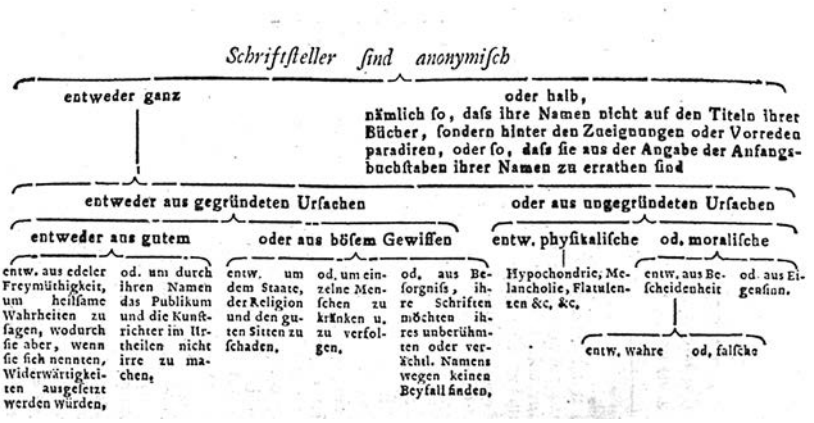

Fig. 2. "Schriftsteller sind anonymisch", from: *Das Gelehrte Teutschland oder Lexikon der jetzt lebenden Teutschen Schriftsteller*, angefangen von Georg Christoph Hamberger, fortgesetzt von Johann Georg Meusel, 5th ed., vol. 12 (Lemgo 1806), LXXXV.

However, prefaces explaining why the authors have written their works appear almost as frequently in anonymous publications as in those with authors' names[17]—even if anonymously the authors wanted to explain their motives. Anonymity was intended seriously in most cases: only for less than half of the anonyma[18] has the authorship been established in the last 200 years.

Pseudonyms

Pseudonyms[19] can be passed over swiftly, since they play only a tiny supporting role in my *corpus* of texts, whereas in annual anthologies [Musenalmanache] and Anacreontic verse, for example, they are a natural part of the playful character of the genre. I shall, however, mention that a successful series of economic and veterinary handbooks was published under

[17] Of the 2,156 anonymous titles in our sample which I have examined, 497 = roughly 23 per cent have prefaces; of the 4,193 with authors' names which I have examined, 1,381 = roughly 33 per cent.

[18] In 2,667 of 6,616 titles = 43.6 per cent.

[19] Cf. Erich Kleinschmidt, 'Pseudonym', in *Reallexikon der deutschen Literaturwissenschaft* (Berlin and New York 2003), vol. 3, 188–190; id., 'Pseudonym', in *Reallexikon der deutschen Literaturgeschichte*, founded by Paul Merker and Wolfgang Stammler (second edn., Berlin 1977), vol. 3, 188–190; Gerhard Söhn, *Literaten hinter Masken. Eine Betrachtung über das Pseudonym in der Literatur* (Berlin 1974).

the pseudonym Erdmann Hülfreich (the author was the Austrian country nobleman Johann Marcus Judtmann von Ehrenfels, 1767–1843); and that the Saxon tenant farmer and prolific author of economic works Ferdinand Christian Touchy (1736–1808) used no less than eleven pseudonyms.[20] Whereas Ehrenfels as a nobleman perhaps did not wish to be associated with manure, cattle disease and an extremely simple style of expression,[21] as a passionate propagandist of popular Enlightenment and successful author, however, he needed an effective brand name;[22] while Touchy more probably tried to avoid being accused of writing too much by the deployment of several fictitious names.[23] Simon Rottmanner (1740–1813), too, one of the most important Bavarian writers on agriculture of the eighteenth century, borrowed from Horace the name of the wise Roman peasant Ofellus,[24] but for the opposite reason, because he wanted to counter the innovation mania of fashionable armchair economists and thus the spirit of the age. He could do that with more security using his mouthpiece Ofellus rusticus—or completely anonymously.

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[20] Viz. C.H. Meisner, D.F. Class, K.F. Anton, C.F. Bär, J.E. Blotz and Johann Ernst Blotz, Chr. Heinrich Dietrich, J.F. Duchänie/Düchänie, G. Gaschütz, C.F. Gaudich, Jh. Fr. Götz and Chr. Tiessen.

[21] Scholarly authors were mainly praised by reviewers for linguistic "lowering" to the people they were addressing in popular works, thought to be a merit and occasionally a great achievement, but, it must be said, only if they had shown in other publications that their own linguistic style reached the level of the usual expression of educated writers. Ehrenfels had not demonstrated this capacity.

[22] The same reason for hiding his name is to be suspected in the *Goldgrube für den Landmann, oder notdürftiger Unterricht von Dünger, was und wie vielerlei er sei? Wie er aufbewahrt werde, und was, wann und wie man damit dünge?* [*Goldmine for the Farm-Worker, or Necessary Instruction on the Application of Manure, Its Nature and Varieties. How It Should Be Kept, and to What, When and How It Should Be Applied*], ed. for the improvement of his countrymen by G.H.z.S.C.M. [George, Duke of Saxe-Coburg-Meiningen] (Meiningen 1804). But not intending to write a series of books on householding matters the duke could do without a brand name.

[23] A certain Carl Schöpfer, who compiled works on a whole variety of subjects under no less than 62 pseudonyms, had a monograph written about him by an infuriated contemporary: Carl Schneitler, *Eine Schande der deutschen Presse, nachgewiesen in der Literatur der Volksschriften* [A Disgrace to the German Press, Identified in Popular Literature] (Stolberg 1846).

[24] Pierer's *Universal-Lexikon* (Altenburg 1861), vol. 12, 220 [digital version available via Google]: "Ofellus, a Roman peasant, whom Horace sets up as a practical sage instructed by Nature, in order to contrast his ancient Roman way of thinking, frugality and equanimity in good and bad times with the ruling manners of his time".

Authors' Names on the Title Page

Names without Additions

We have looked at the motives of authors *suppressing* their names. However, in nearly two thirds of my texts, the author's name stands unequivocally on the title page. In the eighteenth century it is generally not placed without epithets above the title of the work, but syntactically linked with it,[25] whether through the simple word "by" or in more complex phrases which are normally ignored under modern cataloguing rules: "Marcus Herz über die frühe Beerdigung der Juden" [Marcus Herz on Speedy Burial amongst the Jews];[26] "Des Herrn Joseph Karl Edlen von Schmid . . . Praktischer Landwirth" [His Lordship Joseph Karl von Schmid's . . . Practical Farmer];[27] or "Simon Elsässers gewesenen Prälaten zu Murrhardt etc. nützliches und angenehmes Calender-Gespräch" [Simon Elsässer, Formerly Prelate in Murrhardt etc.'s Useful and Pleasant Calendar Dialogue].[28]

Personal Details

The above examples had to be shortened, because in the overwhelming majority of cases the author's name does not stand in splendid isolation on the title pages of early printed books, but is accompanied by all kinds of information about him. The standard German Cataloguing Rules for Research Libraries [Regeln für die alphabetische Katalogisierung in wissenschaftlichen Bibliotheken (RAK-WB)] has legislated for this supplementary information, which they call "Personalangaben" [Personal details, or Epithets], with the brisk injunction: "Personal details including ranks of nobility are normally to be omitted without indication".[29]

Nowadays we are no longer accustomed to such epithets, though they do survive in vestigial form on manuals in certain subject areas: on a guide to fasting for medicinal purposes appropriately a "Dr. med.", popular books of spiritual advice seek to catch readers with a "Dipl. Psych."

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[25] This was a banana-skin for many an author, if the grammatical errors of my examples are not translatable into English: cf. Herzer, *Beiträge* (1799) ("Xaver Herzer's, correspondierendem Mitgliede . . . Kleine Beiträge"), or Müller, *Rathgeber* (1831) ("Von Müller, ein [!] Freund der Haus- und Landwirthschaft").

[26] First edn. Berlin 1787, second corrected and expanded edn. Berlin 1788.

[27] Second edn., Wien and Prag 1793 [= *VA* 2.2/3819].

[28] Oetinger, *Simon Elsassers . . . Calender-Gespräch* (Mannheim 1774) [= *VA* 1/1101].

[29] *Regeln für die alphabetische Katalogisierung in wissenschaftlichen Bibliotheken. RAK-WB. Erarb. von der Kommission des Dt. Bibliotheksinstituts f. alphabetische Katalogisierung (bis 1990). Redaktionelle Bearb.: Hans Popst. 2. überarb. Ausg. Mit Ergänzungslieferungen [4. Erg.lfg. 2002]* (Berlin 1993), 139.

under the author's name, guides to saving on taxes raise increased hopes of efficacy with the indication that the author is a tax advisor, and many a little religious tract reveals to what Order its author belongs. Nowadays it is the custom for title pages to conceal such information: it would be absurd for the author of an historical work to say he is an historian.

Not so in the eighteenth century. Here it is common practice for personal details to be given on the title page, and these are often all we know about the author: whole biographical dictionaries of the period,[30] down to Hamberger/Meusel,[31] were compiled from these statements. Thus the already mentioned strict Cataloguing Rules for Research Libraries decree that epithets be retained to avoid linguistic difficulties or factual ambiguities, *and in the case of early books*.

The list of information contained in personal details[32] on the title page in the eighteenth century is a long one. We find:

- professions
- titles
- functions
- addresses and places of work[33]
- honorifics: membership of Orders; ranks of nobility, including punning titles such as "Ritter von Schulstein" [Knight of Schoolstone] (an educational reformer), "Edler [a noble below the rank of Baron] von Ackerfeld" [of the ploughed field] (an agricultural innovator) or "Edler von Wuthwehr" [defence against hydrophobia] (a pioneer of its treatment)[34]
- prizes received in competitions[35]
- memberships
- honorary offices held

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[30] A particularly striking example: [Samuel Baur], *Charakteristik der Erziehungsschriftsteller Deutschlands. Ein Handbuch für Erzieher* (Leipzig 1790) [= *VA* 2.1/2935].

[31] Hamberger and Meusel 1966 (note 16) did in fact strive to add biographical contributions from the authors themselves and from a network of correspondents, but in many cases could not ascertain any more than was given by an author on his title page.

[32] I should like to retain this concept as understood by librarians, although "personal details" can suggest false associations: insurance policies, dates of first employment, liabilities to Church taxes, and so on, are naturally not included. In a practical sense, the expression covers not only information about the authors themselves, but also about editors, translators, etc.

[33] From chronologically arranged entries, it is possible to follow authors' peregrinations.

[34] Johann Christian, "Schubart von Kleefeld" (1734–1787); Ferdinand Kindermann, "Ritter von Schulstein" (1741–1801); Johann Baptist Martin von Arand, "Edler von Ackerfeld" (1743–1821); Matthäus Mederer, "Edler von Wuthwehr" (1739–1805).

[35] E.g. Johann Paul Harl, *Rede von den Zwecken der National-Industrie* (sixth edn., Erlangen 1821).

– temporary offices held[36]
– career records[37]
– references to previous works[38]

I shall not go into great detail here about the typology of epithets or propose ways to systematise them analytically, but in the spirit of our conference theme I shall present some functions in which epithets could link author and reader in the eighteenth century.

Place of Residence or the Creation of Accessibility Let us begin with the two most frequent, seldom absent[39] elements, the naming of place of residence and occupation or profession. These details are in no way trivial: by the provision of name and place and profession/office/function/title on the title page, the author became accessible by letter; this was an analogue era predecessor of Google and created the conditions for readers to take part in the contemporary culture of letter-writing. Identifying yourself as "Prediger zu Kahlebuy und Moldenit" [Preacher in Kahlebuy and Moldenit],[40] however, was not the way to go about it. The editorial offices of contemporary journals did keep topographical dictionaries amongst their reference books to deal with such cases, but the average reader was lucky if he could make use of the library of his reading-club to determine whether these places were in Bukovina or Lower Pomerania, a not unimportant difference when taking into account painfully high postal rates. This striving for accessibility and addressability is reflected in the specifics of many epithets: "Pfarrer und Cammerer zu Aufkirchen an der Maysach, Ober-Lands-Bayern, Bißthums Freysing" [Vicar and Treasurer in

[36] Such as "Dean pro tem." Johann Christian Gottfried Jörg, *Die Erziehung des Menschen zur Selbstbeherrschung* (Leipzig 1850).

[37] Such as the rise to "Pastor primaries" (with Johann Ludwig Christ, *Allgemein praktisches Gartenbuch*, [posthumous third edn., in bold type, Heilbronn 1842]).

[38] A good example: M[oritz] von Prittwitz, *Die Kunst, reich zu werden* (Ulm s.a. [1840]); earlier examples: Mudge, *Untersuchung* (1778) [= *VA* 1/1337]; J.D. Leyding (ed.), *Der neue Bienenstock* (Hamburg 1764–1768), vols. 1–3 [= addition to *VA* 1]; [Anonymous], *Der wohlunterwiesene Landwirth* (1768) [= *VA* 1/0711]; [J.C. Hirzel], *Der philosophische Kaufmann* (Zürich 1775) [= addition to *VA* 1]; [id.], *Das Bild eines wahren Patrioten* (second edn., Zürich 1775).

[39] Personal details are more likely to be completely absent in articles in periodicals, or restricted to a statement of profession, possibly because the authors were widely locatable and accessible via the periodical concerned.

[40] Christoph Johann Rudolph Christiani, *Ueber die Bestimmung, Würde und Bildung christlicher Lehrer* (Schleswig 1789) [= *VA* 2.1/2733].

Aufkirchen on the Maysach, Upper Bavaria, See of Freysing],[41] "Prediger zu Eulo in der Niederlausitz" [Preacher in Eulo in Lower Lusatia],[42] "Bader in Prutting Rentamts Burghausen" [Village barber-surgeon in Prutting, Tax district Burghausen],[43] "Prediger zu Grossbodungen und Hauröden im Fürstenthum Schwarzburg-Sondershausen" [Preacher in Grossbodungen and Hauröden in the Principality of Schwarzburg-Sondershausen],[44] "Kantor zu Witzelrode, einem Dorf im Herzogl. Sachsen-Koburg-Meiningischen Amte Salzungen" [Cantor in Witzelrode, a village in the Saxe-Coburg-Meiningen Ducal District of Salzungen].[45] Occasionally a record is given of change of address: "formerly Catholic priest in Ansbach, now vicar in Kissingen",[46] "former chaplain in Bretzingen, now Catholic priest in Ansbach",[47] "former teacher in the village school in Weihenzell, now in Happurg, in the Rezat District of the Bavarian Monarchy".[48]

Forms of Address as a Prerequisite of Addressability The correct form of address is far from an eighteenth-century quirk, and was necessary to ensure that letters could be sent at all; compare the flood of contemporary books on forms of address and correspondence manuals. A letter addressed to "Herrn [Mr.] Johannes Müller in Schaffhausen" would have been unforgivably improper, and it was up to the writer to find the correct form of address. He could find help in the statement of personal details, and it must be said that distinguishing between professional posts, titles, offices and honorary offices is crucial for social historians, the more so since unusual epithets can be found, in which it is unclear if one is dealing

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[41] Martin Prugger, *Lehr- und Exempel-Buch* (fourteenth edn., Augsburg 1790); however, that had been copied from earlier title pages: in 1790 the author was no longer living.

[42] [Karl Gottlieb] Horstig, *Einige freundschaftliche Vorschläge* (Brunswick 1791) [= *VA* 2.2/3222].

[43] Franz Georg Nonner, *Der redliche baierische Dorfbader* (s.l. [München] 1791) [= *VA* 2.2/3266].

[44] Wilhelm Ludwig Steinbrenner, *Der Prediger als Aufklärer auf der Kanzel* (Leipzig 1784) [= *VA* 2.2/4103].

[45] Johann Valentin Trautvetter, *Gespräche über verschiedene und insonderheit landwirthschaftliche Gegenstände* (Leipzig 1795) [= *VA* 2.2/4525].

[46] Johann Adam Huberth, *Ueber die Pflichten der Geistlichen* (Würzburg 1790) [= *VA* 2.1/2985].

[47] Martin Klett, *Ueber die Pflichten der Geistlichen* (Würzburg 1790) [= *VA* 2.1/3002]; he was apparently Huberth's successor in office.

[48] Johann Wolfgang Wörlein, *Bibliologisches Lehrbuch der deutschen Volks-Pädagogik* (Sulzbach 1829).

with invented self-descriptors or evidence of new professional and social distinctions.[49]

This self-naming offered a quite serious opportunity to claim expert knowledge in a certain area, or professional qualifications or commissions (cf. fig. 3). It was also, for scholars in particular, an opportunity to describe themselves. What nowadays can be read in a *curriculum vitae* or downloaded from an institutional web-page, forced its way then onto many a title page, so that the typesetter had to reach for his tweezers and the smallest point-size of type available to him to accommodate the cumulated charge of titles, honours and memberships on a title page of normal size. I have counted up to 24 lines crammed with information because of the small type-size; the apogee seems to have been reached in the mid-nineteenth century (perhaps as a result of the drive to professionalize everything). Regional preferences seem also to have emerged: I have found the longest strings of titles on Bavarian and Austrian title pages.[50] This is another field of information for social historians. The development of our modern scientific disciplines can be observed here, the occurrence of new professional fields, the change in competence from barber-surgeons to academically trained doctors, or in veterinary science from slaughterers or shepherds to trained vets, for example. But it is also possible to follow the migration of scholars for professional reasons, or the course of their careers, from lines of type on title pages.

Membership of Societies The insignia of scientists we see in print also offer a history of societies in Europe, not only of academies;[51] the more so since it is hardly possible to distinguish between academies, and economic, patriotic and agricultural societies. On the one hand, memberships are often only listed in general by their places of operation, without

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[49] A few examples only: "Lehrer der Volkstheologie" [Teacher of popular theology]: Sailer, *Glückseligkeitslehre* (1787); "der Vieharznei Doktor" [Doctor of animal medicine]: Klobb, *Handbüchlein* (1790) [= *VA* 2.1/3004]; "der daselbst studierenden Gothaischen und Altenburgischen Landeskinder Aufseher" [Inspector of the students from Gotha and Altenburg studying there]: J.W. Schmid, *Anleitung* (1795) [= *VA* 2.2/4303]; "Naturforscher" [natural scientist]: J.W. Vogelsang, *Landwirthschaft* (1831).

[50] Examples: Harl 1821 (note 35); Johann Heinrich Moritz Poppe, *Volksnaturlehre* (Wien 1826); J.B. Schenkl, *Der Himmel auf Erden* (tenth edn., s.l. [Amberg] 1823); Joseph von Hazzi, *Katechismus über die Zucht . . . von Rindvieh-Gattungen* (München 1836).

[51] A fine overview of the older academies is to be found in Herder's *Konversationslexikon* (third edn., Freiburg 1902), vol. 1, 178–183.

specific names: "Member of academies and learned societies in . . ."[52] On the other, a mixture of fields is quite typical of the age: there is "Hessen Society of Agriculture and the Arts",[53] the "Society of Moral and Agricultural Sciences" in Burghausen, and most notably the "Mainz Electoral Academy of Useful Sciences in Erfurt", which with 36 occurrences wins the prize for appearances on the title pages in our database. Specifically named as academies are moreover the Bavarian Electoral in Munich,[54] the "Theresian",[55] the "Savoyard",[56] the "Josephan Medical and Surgical Academy in Vienna",[57] the "Roman Imperial Leopold-Caroline Academy of Natural Scientists",[58] the Prussian Academy in Berlin, the Palatine,[59] the Royal British Society of Sciences in Göttingen, a "Military Academy" in Stuttgart (which probably means the Caroline High-school),[60] later the "Hohenheim Academy"[61] and the "Royal Academy for Foresters and Farmers" in Tharand;[62] exotic blooms are the Imperial and Royal Academies of Sciences in Roveredo (Grisons)[63] and in Mantua,[64] and for a short time the "Bützow Academy" in Mecklenburg.[65]

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[52] This sometimes sounds really ironic: "Member of a number of variously Imperial, Royal, Electoral and Republican Academies and Societies". See Johann Friedrich Mayer, *Mein Briefwechsel* (1778) [= *VA* 1/1336].

[53] *Landwirthschaftliches Magazin*, ed. by S.G.F. Mund (1788) [= *VA* 2.1/2592].

[54] Sterzinger, *Rede* (1766) [= *VA* 1/0629]; Schrank, *Abhandlung* (1781) [= *VA* 2.1/1556].

[55] Hirzel, *Wirthschaft* (1768) [= *VA* 1/0706a] (referring to Joseph von Sonnenfels).

[56] Ibid.

[57] Mezler, *Einfluss* (1794) [= *VA* 2.2/4035]; Albert Mathias Vering, *Versuch einer Pastoral-Medizin* (Münster 1809).

[58] Sprenger, *Einleitung* (1773) [= *VA* 1/1050]; Philipp Jakob Leiblin, *Ausführlicher Unterricht für die Hebammen* (Ansbach 1781). On the Leopoldina, elevated to an Imperial Academy (with varying places of session) since 1687, cf. i.a. Benno Parthier and Dietrich von Engelhardt (eds.), *350 Jahre Leopoldina—Anspruch und Wirklichkeit. Festschrift der Deutschen Akademie der Naturforscher Leopoldina 1652–2002* (Halle a.d. Saale 2002); and Richard Toellner, 'Die Leopoldina—eine terra incognita in der deutschen Akademiegeschichtsschreibung', *Acta Historica Leopoldina* 49 (2008), 177–187.

[59] John Mill, *Versuch von dem Wetter* (Leipzig 1772); probably identical with the Electoral Society of Sciences in Mannheim. Hemmer, *Begriff* (1783) [= *VA* 2.1/1751]; J[ohann] P[eter] Kling, *Vermischte Schriften* (Mannheim 1789).

[60] Karl August von Schönfeld, *Abhandlung von dem Zustand der Landwirthschaft* (Stuttgart 1780).

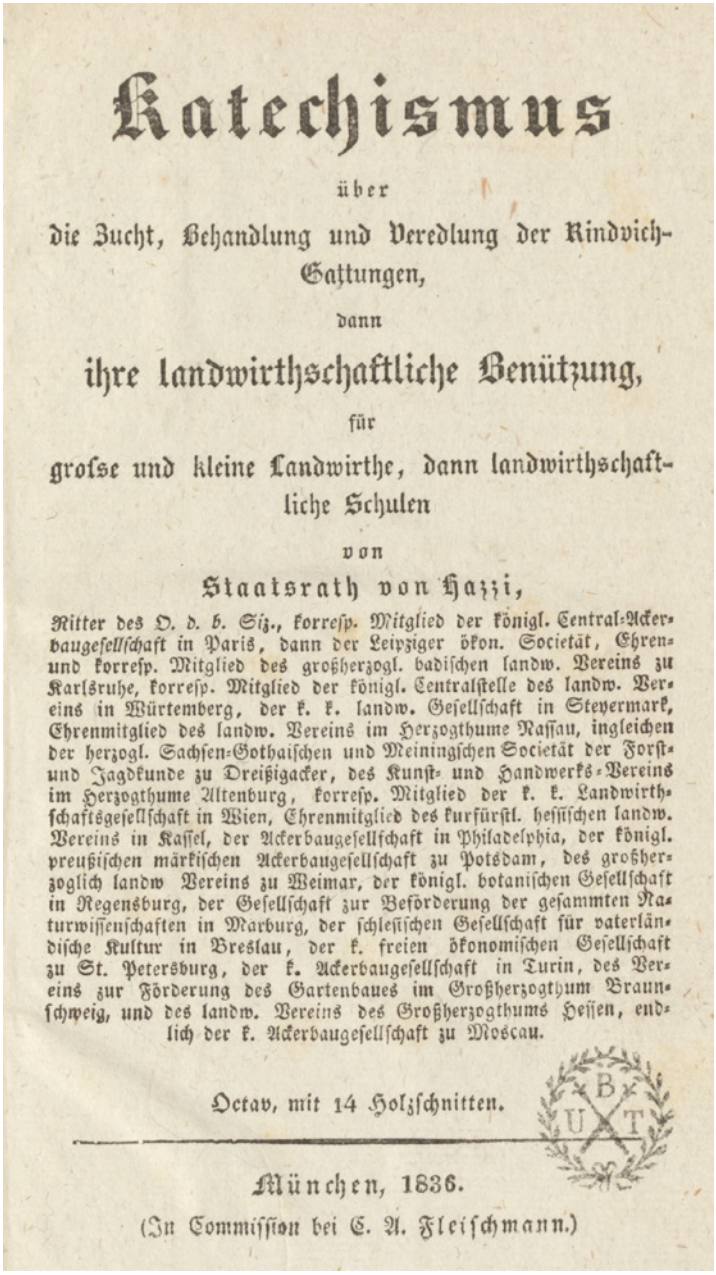
[61] Ed[uard] Lucas, *Der Obstbau auf dem Lande* (Stuttgart 1848).

[62] Julius Adolph Stöckhardt, *Chemische Feldpredigten* (Leipzig 1851).

[63] Karl Rosponte, *Vorschlag, wie der Monarch große schöpferische Geister, die in seinen Staaten verborgen sind, aufdecken und zur Beförderung der Aufklärung anwendbar machen könne* (Brünn 1789).

[64] Careno, *Pockenimpfung* (1795) [= *VA* 2.2/4196].

[65] *Diätetisches Wochenblatt für alle Stände*, ed. by P.B.C. Graumann (1781) [= *VA* 2.1/1578]; Peter Benedikt Christian Graumann, *Abhandlung über die Franzosenkrankheit* (Rostock and Leipzig 1784).



Katechismus

über

die Zucht, Behandlung und Veredlung der Rindvieh-Gattungen,

dann

ihre landwirthschaftliche Benützung,

für

grosse und kleine Landwirthe, dann landwirthschaftliche Schulen

von

Staatsrath von Hazzi,

Ritter des O. d. b. Siz., korresp. Mitglied der königl. Central-Ackerbaugesellschaft in Paris, dann der Leipziger ökon. Societät, Ehren- und korresp. Mitglied des großherzogl. badischen landw. Vereins zu Karlsruhe, korresp. Mitglied der königl. Centralstelle des landw. Vereins in Würtemberg, der k. k. landw. Gesellschaft in Steyermark, Ehrenmitglied des landw. Vereins im Herzogthume Nassau, ingleichen der herzogl. Sachsen-Gothaischen und Meiningschen Societät der Forst- und Jagdkunde zu Dreißigacker, des Kunst- und Handwerks-Vereins im Herzogthume Altenburg, korresp. Mitglied der k. k. Landwirthschaftsgesellschaft in Wien, Ehrenmitglied des kurfürstl. hessischen landw. Vereins in Kassel, der Ackerbaugesellschaft in Philadelphia, der königl. preußischen märkischen Ackerbaugesellschaft zu Potsdam, des großherzoglich landw Vereins zu Weimar, der königl. botanischen Gesellschaft in Regensburg, der Gesellschaft zur Beförderung der gesammten Naturwissenschaften in Marburg, der schlesischen Gesellschaft für vaterländische Kultur in Breslau, der k. freien ökonomischen Gesellschaft zu St. Petersburg, der k. Ackerbaugesellschaft in Turin, des Vereins zur Förderung des Gartenbaues im Großherzogthum Braunschweig, und des landw. Vereins des Großherzogthums Hessen, endlich der k. Ackerbaugesellschaft zu Moscau.

Octav, mit 14 Holzschnitten.

München, 1836.

(In Commission bei C. A. Fleischmann.)

Fig. 3. [Joseph] Hazzi, *Katechismus über die Zucht, Behandlung und Veredlung der Rindvieh-Gattungen* (München 1836), Tübingen University Library.

The many other economic, patriotic and agricultural societies cannot all be listed here; but because of their special importance for the Enlightenment I must mention the "Oekonomische Gesellschaft" [Economic Society] in Bern and the "Naturforschende Gesellschaft" [Society of Natural Science] in Zurich, the "Korrespondierende Gesellschaft der Ärzte und Wundärzte" [Corresponding Society of Doctors and Surgeons] in Zurich, and the "Churfürstlich braunschweig-lüneburgische Landwirtschaftsgesellschaft" [Brunswick-Lüneburg Electoral Agricultural Society] in Celle (I have not encountered the "Gesellschaft des Guten und Gemeinnützigen" [Ethical and Useful Society] in Basle amongst those listed in authors' personal details). While as a rule the great societies have taken care of their own histories in anniversary volumes and the journals they publish themselves, some others appear on title pages of whose existence these mentions may provide the only evidence; for example, a "Mitarbeitende Gesellschaft in Nydau" [Co-operative Society in Nydau],[66] a "Kurpfälzische Witterungsgesellschaft" [Palatine Electoral Weather Society],[67] and a "Gesellschaft für vaterländische Geschichte, Sitten und Rechte" [Society for Homeland History, Customs and Laws] in Wunsiedel.[68] International lustre is provided by mentions of membership of societies in London, Edinburgh, Dublin, Vergara (Bergara in Spain), Dijon, Nancy, Paris, Marseille, Bologna, Florence,[69] Rotterdam, Liège, Stockholm, Lund, St. Petersburg, Philadelphia.

However, for us, these personal details do not constitute an academic Vanity Fair.[70] They become interesting when we can show the relationship between personal details and the content of books.

Authorship Arising from Professional Circumstances First there are the many cases where the theme of a book and the cited qualifications, professions, offices and titles match each other perfectly. With parsons writing

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[66] Pagan, *Versuch* (1765) [= *VA* 1/0585]; the Nidau society was a subordinate society of the Bernese "Economic Society" (a kind communication from André Holenstein).

[67] Hemmer, *Begriff* (1783) [= *VA* 2.1/1751].

[68] Johann Heinrich Scherber, *Gemeinnütziges Lesebuch* (Hof 1796). Probably equally little-known are a "Montägliche Predigergesellschaft" [Monday Preachers' Society] and a "Collegium Philobiblicum" in Leipzig. See Johann Zacharias Hahn, *Das gesellschaftliche Leben als Erziehungsmittel* (Leipzig 1795). Or: the "Oberlausitzische Bienengesellschaft" [Upper Lusatian Bee-Keepers' Society]. See Schirach, *Bienenmeister* (1784) [= *VA* 2.1/1915].

[69] "Königl. Akademie der Freunde der Landwirthschaft" [Royal Society of the Friends of Agriculture]. J.C.L. Simonde, *Gemählde der toskanischen Landwirthschaft* (Tübingen 1805).

[70] A participant in the discussion rightly objected that the listing of titles and honours could also be partly a dutiful gesture of thanks to those who had awarded them.

an improving tract, with a doctor writing against dietary prejudices,[71] or with a senior Royal Prussian inspector of buildings providing "countrymen" with "lessons in economic architecture",[72] the writing arises organically from the circumstances of the author's professional activity, and is legitimised by his personal details.[73] With Catholic priests we often find in addition the assurance: "Cum permissione superiorum" and its German translation "Mit Erlaubnis der Oberen",[74] and even in strangely convoluted Bavarian: "Begnehmigt vom Hochwürdigstem Ordinariat" [Approved by the reverend Consistory].[75] These books are often written "to commission" or even "by command". *A Book of Christian Morals for the Citizen and Countryman by Johann Friederich Feddersen, Preacher in the Cathedral in Brunswick. Written to a Commission from a High Authority*;[76] *The Holy Writ of the New Testament. By Command of the Reverend Prince and Lord, Lord Rupert II. Abbot of the Princely Chapter of Kempten, etc. etc. For the Benefit and Use of the Princely Subjects, Edited* [*!*] *by Dominicus von Brentano*;[77] *Tables Excerpted from the Alphabetic Pocket-Book of the Principal Methods of Resuscitation for People Apparently Dead. Written in German and Bohemian by High Command of the Imperial and Royal Bohemian Governor's Office by Adalbert Zarda, Doctor and Professor of Forensic Medicine*.[78]

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[71] *Arzneien wider ökonomische, physikalische und diätetische Vorurtheile*, ed. by F.A. Weber (1775) [= *VA* 1/1178].

[72] Manger, *Bauwissenschaft* (1785) [= *VA* 2.1/2056].

[73] Philippe Hequet, *Arzney und Chirurgie der Armen* (Augsburg and Leipzig 1769); *Neuer Kalender ohne Aberglauben* (s.l. [Berlin] 1786ff.) [= *VA* 2.1/2228]. A characteristic example of books published while in office can be found in Callisen, *Werth* (1795) [= *VA* 2.2/4195]: in it a General Superintendent addresses the parsons in the district for which he is responsible.

[74] Examples of the second: Klaiber, *Gebet- und Unterrichtsbuch* (1796) [= *VA* 2.2/4469] and Reithofer, *Gebet- Sitten- und Klugheits-Lehrbuch* (1800) [= *VA* 2.2/5370]; for "mit Genehmhaltung [with permission]": Matthias von Schönberg, *Vom Kirchenverbothe wider die schädlichen Bücher* (Köln and Mainz 1784); Braunstein, *Sammlung* (1788) [= *VA* 2.1/2535].

[75] Examples of "Begnehmigung" [approval]: Pichlmair, *Edukation* (1778) [= *VA* 1/1342]; Schmid, *Rede* (1791) [= *VA* 2.2/3302]; *Belehrungs- und Trostrede* (1794) [= *VA* 2.2/3924]; Lechner, *Predigten* (1794) [= *VA* 2.2/4026]; Kefer, *Rede* (1795) [= *VA* 2.2/4249]; Reebmann, *Exempelbuch* (1795) [= *VA* 2.2/4288]; Nack, *Gebethbuch* (1797) [= *VA* 2.2/4681]; *Kurze Abhandlung über die… Wirkung des Wetterläutens* (1799) [= *VA* 2.2/5022]; Nerb, *Predigt* (1800) [= *VA* 2.2/5343]; F.X.V. Mangold, *Der Patriot* (Konstanz 1810).

[76] Hamburg and Kiel 1783 [= *VA* 2.1/1736].

[77] Kempten 1790/91 [= *VA* 2.1/2920] (in reality translated by Johann Georg Lunz).

[78] Prague 1798 [= *VA* 2.2/5019]; personal details from a review in *Neue allgemeine Bibliothek* 43 (1799), 304, not from the work itself.

One preface gives exemplary information about such a commission, and throws light on the public utility scholars felt it their duty to attain in the Enlightenment:

> Dear country citizens!
> About what to do: about the diseases and plagues which strike your domestic animals, that is what I shall talk to you about in this book. The mistakes which many of you make, both in looking after healthy and tending sick animals, are numerous, and every mistake—even the smallest—is dangerous for your house and harmful for your animals.
>
> In no part of your farm-work are you so backward, as in the rearing and keeping of your domestic animals . . . Follow these warnings and lessons in every way! Observe and perform them exactly! Do not thank me, thank Maria Theresia and her exalted sons Joseph the Second and Leopold. I said to the first-named once in conversation, that I wanted to give you a book about animal diseases. 'Write it: do not forget how much your book will help poor country people, and even if I do not live to see it, my children will.' These were the words of our immortal great Theresia. She instilled them so warmly into my mind that I shall never, never forget them.
>
> Four years later, in 1783, Joseph the Second instructed me by my exalted authorities to write this work, and its first trial publications have appeared gradually in six languages and eleven editions. It has been improved over the years through diligence and care, and the most perfect version, after all that have gone before, is provided to you by Joseph the Second. Receive it with dignity and blessings, and thank the donor who has instigated it.[79]

In the case of the Swedish doctor Nils Rosén von Rosenstein (1706–1773), this concern for popularity and public utility went so far as to persuade him to publish his pioneering principal work *Instruction on the Recognition and Cure of Children's Diseases* at first in parts in a popular periodical calendar; the Swedish Academy then published it in book form in 1764.[80]

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[79] Johann Gottlieb Wolstein, *Das Buch von den Seuchen und Krankheiten des Hornviehs, der Schaafe und der Schweine für die Einwohner auf dem Lande. Auf Verordnung einer hohen Landesregierung verfasst von Johann Gottlieb Wolstein, der Arzeney und Wundarzeney Doktor, Direktor und Professor der praktischen Thierarzeney im kais. königl. Thierspital* (Wien 1791) [= *VA* 2.2/3362].

[80] First published in Germany: Gotha and Göttingen 1766. On this, see Alfons Fischer, *Geschichte des deutschen Gesundheitswesens* (Berlin 1933), vol. 2, 156 (note 4); for a contemporary reaction, see Johann Georg Krünitz, 'Kalender', in id., Oekonomisch[-technologisch]e Encyklopädie (Berlin 1784), vol. 32, 443–604: 549 n.

No Plausible Connection between Author and Subject In other cases, a connection between the professions named in the personal details or elsewhere and a book's subject is harder to construct. If a parson writes a *Songbook for Lovers of Gardens*,[81] it is possible to make the link by way of the physico-theology typical of the period, also *Discussions to Further Domestic Happiness*[82] can be explained from the parson's official duties, and even in Johann Peter Süßmilch's famous essay *Divine Order in the Changes in the Human Race Demonstrated from Its Birth, Death and Reproduction*, the declaration "by Johann Peter Süssmilch, Royal Prussian Councillor in the Upper Consistorium, Provost in Cologne and Member of the Royal Academy of Sciences" can perhaps justify Süßmilch's authorship by the genuine parsons' duty of keeping the Church registers.[83] In general, parsons' duties as "Volkslehrer" [teachers of the people][84] in the Enlightenment sense are stretched so widely, also by the official pastoral theology of the period, that we can integrate fruit-tree cultivation, bee-keeping and music without difficulty into their professional ethos, while even a Dr. theol. who writes about plants for animal feed[85] does not surprise us. From the religious supervision of schools comes also the whole realm of pedagogy, children's literature, schoolbooks and books on all curriculum subjects at school level.

Parsons in particular have also won the gratitude of their contemporaries in two areas which do demand special knowledge and impose special responsibilities: the introduction and encouragement of inoculations against smallpox and of lightning conductors. They did not restrict this work to recommendations in sermons. Inoculations carried out in person is recorded e.g. for the parsons Johann Moritz Schwager (1738–1804), Christian Gottlieb Kluge (1742–1824) and Gustav Bergmann (1749–1814, gold medal for the performance of 8,000 inoculations himself); others had their children inoculated first as examples to be followed, organised inoculation campaigns and made their parsonages available as inoculation stations. And lightning conductors did not only beckon from the pulpit,

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[81] Christoph Christian Sturm, *Gesangbuch für Gartenfreunde und Liebhaber der Natur* (Hamburg 1781).

[82] Cramer, *Unterhaltungen* (1781) [= *VA* 2.1/1511].

[83] Johann Peter Süßmilch, *Die göttliche Ordnung in den Veränderungen des menschlichen Geschlechts* (first edn. Berlin 1741, second revised edn. Berlin 1761), vol. 1.

[84] Cf. Reinhart Siegert, 'Die "Volkslehrer" [Teachers of the people]. Zur Trägerschicht aufklärerischer Privatinitiative und ihrer Medien', *Jahrbuch für Kommunikationsgeschichte* 1 (1999), 62–86.

[85] Knecht, *Abhandlung* (1780) [= *VA* 1/1449].

but, also as examples, from church towers and parsonages. Added to this Enlightenment practice were naturally flanking publications, whose authors are revealed as parsons by their personal details. As propagandists for lightning conductors, special fame was reaped by the school reformer and abbot Ignaz von Felbiger[86] and the Dillingen (later Landshut) theologian, teacher of physics and passionate country parson Joseph Weber.[87]

This engagement in the Enlightenment is not only to be found amongst parsons, but also amongst other scholars and educated men of the period. A few pairings of book-titles and personal details may illustrate this. A "Marquis Caraccioli, Royal Polish and Saxon Electoral Colonel" writes on the *Practical Land Economics of the Ancients. Together with a Sketch of How to Revive It for the Common Good*.[88] "Friedrich Eberhard von Rochow, Hereditary Lord of Reckan" is not too grand to write, under his own name, *The Children's Friend. A Reader for Use in Country Schools*,[89] the pioneering popular school-book of the Enlightenment. The little book *Swabian Horse-Doctor, or Instruction on the Recognition and Cure of Horse Ailments. With a Supplementary Book of Prescriptions*[90] bears the personal details: "by W.G. Ploucquet, Doctor of Philosophy and Medicine and Professor of the latter".[91] A famous Swiss example is the Zurich city physician Johann Caspar Hirzel the elder (1725–1803). His best-known book is *The Domestic Management of a Philosophical Peasant*,[92] in which he introduced to the world the not terribly philosophical, but especially sensible-seeming model peasant Kleinjogg; he stands by his creation with his good name and the titles "M[edicinae] D[octor] und City Physician", and organises for

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[86] Cf. Johann Ignaz von Felbiger, *Die Kunst, Thürme oder andere Gebäude vor den schädlichen Wirkungen des Blitzes durch Ableitungen zu bewahren, angebracht an dem Thurm der Saganischen Stifts-Pfarrkirche von dem Abt dieses Stifts* (Breslau 1771); and [Anonymous], *Wie weit gewähren wohl die Gewitterableiter Sicherheit für umstehende Gebäude? . . . von dem Verfasser der Schrift, in der die Kunst, Thürme durch Ableiter zu bewahren, beschrieben . . . ist* [*i.e. Johann Ignaz von Felbiger*] (Pressburg 1786) [both are additions to *VA* 1].

[87] Joseph Weber, *Unterricht von den Verwahrungsmitteln gegen die Gewitter für den Landmann.* (*Im Sokratischen Tone.*) *Von Joseph Weber, öffentlichem Lehrer der Naturlehre an der hohen Schule zu Dillingen* (Salzburg 1784) [= *VA* 2.1/1956], plus five more works on lightning conductors by Weber: *VA* 2.1/1942, 1955, 1957, *VA* 2.2/3349 and 5430.

[88] Augsburg 1770 [an addition to *VA* 1].

[89] First edn. Brandenburg and Leipzig 1776 [= *VA* 1/1227 with an indication of its effect].

[90] Tübingen 1780 [= *VA* 1/1464].

[91] For other relevant titles by Ploucquet, see *VA* 1/0620, 0895, 2.1/1548, 2079, 2.2/2538, 3936, 4503; cf. Frank Kuhn, 'Wilhelm Gottfried Ploucquet', *Beiträge zur Volkskunde in Baden-Württemberg* 6 (1995), 330–376.

[92] First edn. Zürich 1761 [= *VA* 1/0414 (note 1) and a series of other editions].

the Swiss Natural Science Society his famous "peasant conversations", in which real peasants from the Zurich jurisdiction discuss progress.[93] Hirzel translates and improves Simon Auguste André David Tissot's *Guide for Country People in Respect of Their Health*;[94] his son Johann Caspar Hirzel the younger carries on his "dear father's" popularising line (preface), and also writes for women in general and for midwives in particular a *Reading-Book for Women on Midwifery* in full professional rig as "Doctor of Medicine, Ordinary Member of the Great Council of the Republic of Zurich, and Corresponding Member of the Economic Society in Leipzig".[95] It is no longer surprising, therefore, if Georg Heinrich Piepenbring, "Doctor of Medicine, Chemistry and Pharmacy, and Honorary Member of the Botanical Society in Regensburg" has thoughts not only in his specialisms but also *Thoughts on the Danger of Lead Glazes in Domestic Pottery*[96] and *On the Improvement of Spinning-Wheels as a Contribution to Female Health*,[97] and writes, "for economists of all classes" a *Guide to the Various Sorts of Soil in Arable Land and to Manures and Dressings*.[98] Or the Brunswick-Lüneburg infantry lieutenant Friedrich Ludwig von Pufendorf and his *Practical Proposals for the Complete Eradication of Smallpox, Recommended to Regents, Statesmen and Philanthropists for Mature Consideration and Adoption*.[99] Or even Dr. med. Johann Benjamin Erhard's *On the Right of a People to a Revolution*.[100]

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[93] Cf. Rolf Graber, 'Reformdiskurs und soziale Realität: die Naturforschende Gesellschaft in Zürich als Medium der Volksaufklärung', *Schweizerische Zeitschrift für Geschichte* 47 (1997), 129–150; this also lists the earlier literature, including Hans J. Wehrli-Keyser, *Über die landwirtschaftlichen Zustände im Kanton Zürich in der zweiten Hälfte des 18. Jhs. Nach den Berichten der Ökonomischen Kommission der Naturforschenden Gesellschaft* (Zürich 1932).

[94] In German, Zürich 1762 and frequently thereafter [= *VA* 1/0462 and a series of later editions].

[95] *Lesebuch für das Frauenzimmer über die Hebammenkunst* (Zürich 1784) [= *VA* 2.1/1873]; the quotations are from the interesting preface and the title page.

[96] Georg Heinrich Piepenbring, *Ueber die Schädlichkeit der Bleyglasur der gewöhnlichen Töpferwaaren* (Lemgo 1794).

[97] Georg Heinrich Piepenbring, *Ueber die Verbesserung des Spinnrades aus Rücksicht der Gesundheit des weiblichen Geschlechts* (Leipzig 1795) [= *VA* 2/4283].

[98] Georg Heinrich Piepenbring, *Anleitung zur Kenntnis der verschiedenen Ackererdarten* (Hannover 1797) [= *VA* 2.2/4690].

[99] F[riedrich] L[udwig] von Pufendorf, *Ausführbare Vorschläge zur gänzlichen Vertilgung der Blattern* (Brunswick 1792) [= *VA* 2.2/3542].

[100] Johann Benjamin Erhard, *Ueber das Recht des Volks zu einer Revolution* (Jena and Leipzig 1795) [= *VA* 2.2/5206].

Prefaces as Mirrors of an Enlightenment Ethos

I return to the modest book of caterpillars by the Imperial Notary Johann Gottfried Hübner. It bears on the verso of its title-leaf the motto:

> We all make mistakes
> But each in his own way.
> v. Haller.[101]

And in the preface the author gives an account of how an Imperial Notary comes to be giving peasants instruction on the eradication of insect pests:

> I have tried primarily to show how certain prejudices of peasants are partly ridiculous and partly harmful, indeed an injury to human reason and nature.
>
> For a number of years, in the hours not dedicated to my business interests, I have occupied myself with natural history, and especially entomology. In collecting insects, I have often had the opportunity to discover certain errors and the incorrect methods chosen for the eradication of harmful caterpillars. I have therefore considered it my duty to make known my thoughts on the matter, and to recommend methods which I am convinced would be more useful.
>
> I shall be sufficiently rewarded if I can give to others in closer contact with country people and able to advise them, an opportunity to lead them to further consideration of the matter.[102]

In his combination of book title, his personal details and preface, Hübner had demonstrated that he a) had acquired a professional qualification, b) had pursued scientific interests which had nothing to do with this profession, and of which he gives a sample with this publication,[103] and above

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[101] "Wir irren allesammt/Nur jeder irret anders." Hübner 1781 (note 5), title page verso. This aphorism is usually ascribed to Georg Christoph Lichtenberg, *Vermischte Schriften* (Göttingen 1802), vol. 4, no. 3, but in fact comes from Haller's *Gedanken über Vernunft, Aberglauben und Unglauben* of 1729. Hübner cites from the last edition to appear in Haller's lifetime: *Versuch schweizerischer Gedichte* (Bern 1777), 79; the original version had been the less satisfactory "Wir irren alle gleich. Nur jeder irret anderst".

[102] Hübner 1781 (note 5), 3f. Hübner's *Gedanken* are not themselves a popular book, but rather an offer to intermediaries. The lack of a reference to Hübner's place of work until now may be connected to the fact that the publication appeared in the co-operatively organised "Buchhandlung der Gelehrten" [Scholars' Bookshop], to which letters for the author could be addressed.

[103] On the further career of Hübner, who finally switched completely from notary to scientist—not unusually for the eighteenth century—, see URL: www.entomologentagung2003.uni-halle.de/history.html (accessed 07.10.2008): "Kurzer Abriss der Geschichte der Entomologie am Institut für Zoologie der Martin-Luther-Universität Halle-Wittenberg".

all c) is an educator with a view to public utility and prepared to intervene in the process. Since his position at the time gives him no direct contact with country people, he must rely on others as intermediaries to put his insights into action.

The monk and country priest Dominikus Schmid was just such an "other, in closer contact with country people", and he only had one book printed: *Practical Essays on Arable Farming in Swabia, Written by Father Dominikus Schmid, Canon of the Imperial House of God in Roth* [Rot on the Rot in Upper Suebia] *and Currently Cellarer*.[104] He begins his work with the words:

> Every man is pledged to serve his neighbour for the common good with the gift he has received from God. This is the reason why I, the member of an Order, indeed, have undertaken to communicate what I have observed in agricultural matters almost from my youngest days and have practiced successfully myself, with the good intention of serving my neighbour . . . We are ever fortunate to live in an age when it is possible, even from above, to cast an enquiring eye on the work of the peasant . . .[105]

In conclusion, I should like to choose one more preface from the hundreds written from educational and patriotic motives, whose author cannot be accused of boasting in his own interest—because he has not been unmasked to this day. I quote from an anonymous brochure with the title: *Information for Country People about Blight in Cereal Crops*, published in Bern in 1783. It says:

> The means I describe and recommend to my countrymen here are not superstitious or visionary inventions and secrets, but long tried and tested facts; used, experienced and established not merely by foreign peasants, but also by our own, with years of the greatest, most certain success. Why are they then so little-known, I hear you ask. Why? He who knows how prejudice, avarice, selfishness can work on country people of all ranks, will find the answer for himself. When, in the higher class of farmers, amongst sensible and able people, many discuss their own advantage so rarely and value that of their country so little, whereas they ought to take pride and pleasure in

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A translated extract from this account reads as follows: "In the winter term of 1803, Privatdozent (a lecturer not on the permanent staff) Johann Gottfried Hübner delivered a special lecture on entomology. Hübner was at the same time Inspector of the collection of natural objects. He was in close contact with important naturalists and entomologists, such as Linnaeus and Fabricius, for example. This explains the origin of the species name 'huebneri' for beetles corpidis, Dytiscus and Cryptocephalus. Hübner founded the Institute's extensive collections of butterflies."

[104] Ulm 1791 [= *VA* 2.2/3301].

[105] Ibid., 3 and 6.

> setting an example to country folk in useful actions and institutions, how can we then blame the country folk themselves?
>
> These were not the thoughts of those friends of humanity, of their nation and their fatherland, who, moved by the devastation caused by blight in cereal crops, the source of our primary and most essential food, observed them, researched their nature, tracked down their causes, and investigated their origins, progress, development and effects with tireless diligence, and finally discovered their probable cause.
>
> Thanks are due to these noble men from all well-meaning people; I offer them mine through the collection and publication of their discoveries. All I expect to gain by it is in service to my compatriots, whom I love, and to my fatherland, for which I live.[106]

I close with this model of Enlightenment patriotism,[107] which we find implicitly in many a detail of contemporary title pages, and explicitly formulated in many prefaces. And first of all in works by scholars, then in works by educated people, and finally also in works by ordinary people: peasants, workmen, school-teachers.[108]

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[106] [Anonymous], *Nachricht an das Landvolk vom Brande im Getreide* (Bern 1783), 4f. I have found no holdings of this work recorded, but have held it in my hand in the Zurich Central Library in its tract volume 18/1667 [as no. 4].—Cf. Niklaus Emanuel Tscharner, 'Von dem Brand und von dem Rost im Getreide', *Abhandlungen und Beobachtungen der Ökonomischen Gesellschaft Bern* (1764), vol. 5, no. 2, 27–40 [= *VA* 1/0545].—A motto which fits it exactly is to be found on the title pages of Christian Carl André's *Calendar*: "There are teachers of mankind who are not discoverers, and yet truly important and immortal people, those who take what others have discovered, and, even if it is generally known to one country, make it known to another." Christian Carl André, *Neuer Nazional-Kalender für die gesammte österreichische Monarchie auf das Jahr 18.. für Katholiken, Protestanten, Griechen, Russen, Juden und Türken* [New National Calendar for the Entire Austrian Monarchy . . . for Catholics, Protestants, Greeks, Russians, Jews and Turks. Based on the Meridian of Brno. For the Education and Delectation of the Religious and Secular, Teachers and Officials, City- and Country-Dwellers; Arranged in a Comprehensible Way] (Prag 1811–1822), vols. 1–12.

[107] On further occurrences of "Patriotismus" [patriotism], "Vaterlandsliebe" [love of the fatherland], "Gemeinnützigkeit" [the common good] and the like in title formulations, our database provides the following evidence: "gemeinnütz./gemeinen Nutz" 629 times; "patriot." 243 times; "Vaterland/vaterländ." 320 times; "Geschenk" [present] (as in Andreas Straub, *Sichere Heilart der Faulfieber. Ein kleines Geschenk meinem helvetischen Vaterlande* [A Sure Way to Cure Putrid Fever. A Little Present to My Swiss Fatherland] (s.l. 1800) [= *VA* 2.2/5401]) 55 times; "Gabe" [gift] 18 times; further, "Verbess." [improv.] 658 times; "Veredl." [ennobl.] 129 times; "Beförderung" [furthering] 437 times; "zum Besten" [for the benefit of] 286 times; "zum Nutzen" [for the advantage of] 177 times. It is our aim to open our database on the Popular Enlightenment for research purposes in ways and subjects which go far beyond the possibilities of the printed version of this biobibliographic handbook.

[108] A finely formulated example on this point too: Nicolaus Müller, *Es blühe der fränkische Weinhandel und dessen Veredlung! Ein Scherflein auf den Altar des Vaterlandes gelegt* [Let the Franconian Wine-Trade and Its Ennoblement Blossom! A Mite Laid on the Altar of His Fatherland] *von Nicolaus Müller, Schuldheiss* [Magistrate] *zu Mark*[*t*]*-Wipfeld im hochfürstl. Würzburg. Amte Klingenberg* (Würzburg 1796) [= *VA* 2.2/4488].

Conclusion: The Enlightenment Author of Works of Public Utility in the Mirror of Paratexts

I must sadly refrain from investigating what personal details reveal about the careers, job-hunting, self-importance, international nature, versatility and political attitude of their originators; I cannot go into exotic authors, who appear beside scholars, or ironic naming of titles, or incipient[109] or actual imposture;[110] and I can only mention the often very telling mottoes, dedications, lists of subscribers, prefaces and covering notes which are frequently added to works of the eighteenth century. These hitherto largely disregarded paratexts present us in their totality with a mostly neglected lexicon of an age. We should use it!

[109] On Andreas Schellhorn, *Teutsche Sprichwörter* (Nürnberg 1797) [= *VA* 2.2/4706], the otherwise entirely approving reviewer in the *Oberdeutsche allgemeine Litteraturzeitung* [*OALZ*] corrects the personal details with an insertion: "Professor an der hohen Schule (unseres Wissens Lehrer der Grammatik am Gymnasium) zu Würzburg" [Professor at the University (as we know, a teacher in the Gymnasium) in Würzburg]. See *OALZ* 2 (1797), 844.

[110] A certain Max Georg Blumenschein, who around 1790 made a vehement case for employment by virtue of his production of works of public usefulness, seems for two of his popular works [*VA* 2.1/3303 and 3304] to have used the pseudonym "Heinrich Eduard von Klobb, der Vieharzneykunst Doktor [von Klobb, Doctor of veterinary science]", thus falsely appropriating a noble name and a doctorate, so that these two works would certainly not help to qualify him for a better career under his real name. His dates and exact details can not be established exactly, even using the *Deutsches Biographisches Archiv* (DBA).

POLITICAL COUNSEL: A HISTORICAL PERSPECTIVE

Justin Stagl

No man in Israel was as beautiful as Absalom, whose most stunning feature was his hair; shorn once a year, it weighed 200 lots. Absalom was David's most beloved son, and according to the Bible he also "stole the hearts of the men of Israel" (2 Samuel 15:6) and eventually had himself proclaimed king in David's place. Among those who joined in Absalom's rebellion was David's chief counsellor, Ahithophel. When David heard this news, he fled Jerusalem immediately, praying as he went: "O Lord, I pray thee, turn the counsel of Ahithophel into foolishness." But David also sought worldly aid, asking his friend Hushai to feign allegiance to Absalom in order to counteract the counsel of Ahithophel (2 Samuel 15 31–34).

Ahithophel gave Absalom two clever pieces of advice. The first was that he should sleep with David's concubines. This Absalom did in a tent on the roof of the royal palace "... in the sight of all Israel" (2 Samuel 16:22). The Bible reports in this respect: "Now in those days the counsel which Ahithophel gave was as if one consulted the oracle of God; so was all the counsel of Ahithophel esteemed, both by David and by Absalom" (2 Samuel 16:23). The result of this first piece of advice was that Absalom made a conspicuous and irrevocable break with his father.

The second piece of advice was more complicated. Ahithophel counselled that the fleeing David should be pursued and struck down that very night, and his followers delivered to the new king. Ahithophel himself even offered to lead a force of men to do this. But Absalom shrank from taking action and consulted Hushai for a second opinion. Contradicting Ahithophel, Hushai advised that this surprise coup was too risky; if it failed, it could have a demoralising effect. It would therefore be better to summon all Israel, in order to ensure that David and every one of his men could subsequently be eliminated. Although counterproductive, this counsel was psychologically better adapted to its beautiful and virile, but indecisive addressee. Absalom elected to follow Hushai's advice. This allowed David time to withdraw to the desert, where he raised an army. At this point the Bible reports very tersely: "When Ahithophel saw that his counsel was not followed, he saddled his ass, and went off home to his own city. And he set his house in order, and hanged himself; and he

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died, and was buried in the tomb of his father" (2 Samuel 17:23). This time, Ahithophel had foreseen events correctly: David defeated those who had risen up against him. Absalom, passing beneath an oak tree on a mule, entangled his hair in the branches; hanging from the tree, he was subsequently slain.

When another poorly-advised king's son rose up against his father 2600 years later, the poet John Dryden wrote in a contemporary poem:

> With wonder late posterity shall dwell
> On Absalom and false Achitophel[1]

The English, well versed in the Bible, likely recalled the story of Absalom, allowing Dryden to use it as a background for the Duke of Monmouth's rebellion against King Charles II and draw startling parallels.[2] The counsellor in political life has been an issue since the beginning of recorded history; even today, this biblical tale can be taken as the starting point for an analysis of political counsel.

The offering of counsel is a basic circumstance not only of political life but of social life in general. It appears in all cases to be composed of five elements: the *seeker of counsel*; the *counsellor*; the *counsel offered*; *mutual trust*; and a *shared world-view*. Private counsel will not be dealt with here, however; in what follows we shall consider only political counsel.

Seeker of counsel: Genuine counsel should be sought rather than offered as unwanted advice. A seeker of counsel is someone who hesitates to act alone, uncertain whether his own powers of reasoning are an adequate basis for taking the right decision. Hence he looks for help from another source. Possible external sources of aid in decision-making include predictions made by oracles, the pronouncements of prophets, cases of precedent and rules of wisdom based on experience, and other relevant experience-based knowledge. The forecasts of oracles and prophets are of a supernatural character, whereas cases of precedent, rules of wisdom and experience-based knowledge are accessible to anyone, even if they are not broadly familiar to everyone. Counsel is thus not sought indiscriminately, but only from someone trusted to be of genuine help in making the best decision. Counsellors who fall into this category are community members

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[1] John Dryden, *Absalom and Achitophel* (London 1681), part I and (London 1682), part II, quoted here near the end of part II (part II was composed by Nahum Tate and was merely revised by Dryden).

[2] See, for example, Bernard Nicholas Schilling, *Dryden and the Conservative Myth: A Reading of "Absalom and Achitophel"* (New Haven 1961).

who have a reputation for knowing what to say and do. By consulting them, the seeker of counsel also indirectly obtains aid in decision-making from the community, to which such counsellors owe their reputation. Thus solitary decisions, frowned upon in every community, are replaced with decisions to which the community has contributed. Indeed, it could be said that embedding individual decisions in the context of collective practice is one of the main functions of counselling. This applies above all to political decisions that affect the fate of a community as such. In what follows, seekers of counsel who need to make political decisions will be referred to as "decision-makers".

Counsellors: Political decisions regularly need to be taken under the pressure of events. Decision-makers accordingly depend on people who are consistently able to provide them with help in making decisions. These people thereby gain a political function associated with the decision-makers who seek their counsel. They exert an indirect form of power known as influence. This is predicated on an imbalance of power between the two parties. If the counsellor had as much power as the decision-maker, he would be a potential rival and his counsel would consequently be suspect. If he had greater power than the decision-maker, his counsel would no longer qualify as such but would be a command. Hence a genuine counsellor must possess significantly less power than the decision-maker. Although counsellors in politics enjoy respect and influence, they are frequently excluded from direct exercise of power owing to their origins or other limiting factors, and thus they are not potential rivals of those who seek their counsel. Their compensation for this political subordination comes from the intellectual pre-eminence to which they owe their function. Nonetheless, they are not among the rulers but among the ruled—whom they also represent in situations where counsel is given.

Counsel offered: Counsel consists of an option for action which the counsellor proposes to the decision-maker as the right course to take. The counsellor must represent his proposition with the authority of his personal reputation; as the example of Ahithophel illustrates, he may even offer to carry out his counsel himself, but he is held responsible for it in any event. Yet before such a proposal is advanced, the decision-maker assesses the situation with the aid of the counsellor, reviews the options for action together with their consequences, and then chooses what seems to him to be the most reasonable option. Assessing a situation in this fashion constitutes diagnosis, prognosis and therapy all in one step. In this sense the counsel offered is not the intellectual property of the counsellor alone; it is the result of his interaction with the decision-maker and must

therefore be adapted not only to the situation but also to the personality of the seeker of counsel—as Ahithophel discovered to his disadvantage. These two requirements cannot always be easily reconciled. In classical rhetoric, a distinction was made between deliberative oratory [genus deliberativum] and the oratory of praise [genus demonstrativum]. In the former, the speaker, together with the person he is addressing, seeks to understand a situation objectively; in the latter, the speaker seeks to flatter the person he is addressing. Good counsel is not only valuable; it is frequently unpleasant as well. Yet it is difficult to separate these two types of counsel in practice. In the case of political counsel, the person of the decision-maker—including his human weaknesses—is also a significant factor in the situation and must be taken into consideration by the counsellor. The type of counsel appropriate for the politically shrewd David was not appropriate for the foolhardy Absalom. Conversely, a decision-maker who wants to be successful must choose the right counsellor and listen to him even if his advice is unwelcome—in Absalom's case, this was not Hushai but Ahithophel.

Mutual trust: Both the dispensing and the acceptance of counsel are predicated on trust. Trust, however, is put at risk by both of the parties involved. Thus the counsellor, who must take account of the personal weaknesses of the seeker of counsel, is tempted to manipulate the latter. Ahithophel's disastrous error in transferring his loyalty from David to Absalom might be attributed to the ambition of elevating himself to a "grey eminence" under the neophyte prince. More common still is the temptation to accept a bribe from a third party. The decision-maker, for his part, is tempted to continue seeking counsel under the pretext of thoroughness until he finally receives the advice he wants to hear or, in the case of failure, to exonerate himself at the expense of his counsellor. Moreover, each party is aware of the other's temptations, allowing mistrust to permeate the situation.

Shared world-view: Although usually not addressed directly, this factor is relevant when questions of existence are at stake. This is precisely the point illustrated by the story of Absalom and Ahithophel. Here, two world-views are at odds with one another, although their incongruence is not clear from the outset. Ahithophel's counsel takes only natural factors into account, drawing from a pool of wisdom that Israel shared with neighbouring peoples. Yet Israel also saw itself as God's chosen people. The biblical story disapproves of the wisdom of Ahithophel. The comparison between his counsel and that of God is ironic, and an ominous portent for Ahithophel. The same God who had called David to be king hears his

prayer and transforms Ahithophel's wisdom into foolishness. Absalom's purely worldly power advantage is doomed as a result. The intervention of God in human history shifts the parameters of the decision-making situation in the biblical story. What counts as natural and supernatural in a world-view admittedly changes throughout history. The direct intervention of God in history is no longer plausible in modern times. But in modern times, too, as we shall see, the parameters of decision-making situations are shifting.

If a shared world-view is an issue where counsel is being sought and given, intellectuals gain an opportunity to have political influence. Although they are interdependent, power and reason nonetheless exist separately. In ancient Israel intellectuals appeared in the form of prophets, and the counsel they gave on political matters was derived from their direct relationship with God.[3] They generally dispensed advice without being asked for it, although their counsel was sometimes sought as well. It was prophets who legitimised the kingship of David and that of his son Solomon; the Bible speaks in terms that reflect this. Solomon was regarded as the ideal ruler in whose time people dwelt in safety, "every man under his vine and under his fig tree" (Micah 4:4). This peaceful rule was based on Solomon's favour in God's eyes, his widely admired and sought-after political wisdom, and systematic gathering of knowledge based on experience—as exemplified by Solomon's descriptions of animals and plants in poems and proverbs (1 Kings 4). It is remarkable that this ideal kingdom collapsed so rapidly following the king's death.

Intellectuals with political agendas also appeared several centuries later in Greece. Greek philosophers, of course, did not base their authority on God; they appealed to reason. Plato's "rule of philosophers" sought to unite reason and power. One attempt to realise this vision with the help of one of Plato's students, the Tyrant of Syracuse, was unsuccessful, however. Nevertheless, Plato continued to educate future rulers and future philosophers together in his Academy.[4]

Political humanism in early modern history drew upon examples such as these. Education of rulers and the participation of intellectuals in the exercise of power would result in a rule of peace, justice and intellectual

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[3] See, for example, Werner Stark, *The Sociology of Religion. A Study of Christendom*, vol. 3: *The Universal Church* (London 1967).

[4] See Peter Scholz, *Der Philosoph und die Politik. Die Ausbildung der philosophischen Lebensform und die Entwicklung des Verhältnisses von Philosophie und Politik im 4. und 3. Jhdt. v. Chr.* (Stuttgart 1998).

advancement. Behind such grandiose programmes, no doubt, were the interests of counsellors who had become indispensable to complex statecraft in early modern history and who wished to share in the exercise of power.[5]

Programmes based on these principles were implemented by missionary orders, as in the Jesuit state of Paraguay, for instance. A colonial situation makes it possible to exercise power more deliberately and according to plan than is feasible at home. But in Europe as well, decision-makers had to take account of the "autonomous discourse" (Wolfgang Reinhard)[6] of intellectuals, i.e. justify their exercise of power by the requirements of reason. In fact, intellectuals underestimated the readiness of those in power to be influenced by arguments based on reason, and, wrapped up in the inner logic of their programmes, they lost sight of political reality. This was the primordial dilemma of political humanism. A way around this dilemma was offered by the utopian novels that followed in the wake of Thomas More's *Utopia*, which showed a fondness for referring to Solomon and Plato. Designers of utopias succeed in eliminating the obstacle of reality by making it inconsequential.

Utopias in the early seventeenth century show a partiality for describing communities similar to religious orders that draw upon wisdom and knowledge throughout the world and shape it into programmes of action. Their counsel is either sought by decision-makers who cooperate with them or it is implemented by the communities themselves, i.e. they become church and state combined into one. However, this shift from the real to the utopian was also unable to resolve the dilemma of political humanism completely. As generous as such utopian communities are with their counsel, they are reticent when it comes to the experience from which this counsel is derived. They gather knowledge and wisdom clandestinely, most likely even by means of espionage or violation of confessional secrecy. This often deceitfully obtained knowledge is converted into political power. The moral ambiguity of these actions is justified by the beneficial purpose of these communities or by their mission to bring about the messianic Kingdom of Peace.[7]

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[5] See Wolfgang Reinhard, *Geschichte der Staatsgewalt. Eine vergleichende Verfassungsgeschichte Europas von den Anfängen bis zur Gegenwart* (München 1999), 125–209; Ralf Elm (ed.), *Vernunft und Freiheit in der Kultur Europas* (Freiburg and München 2006).

[6] Reinhard 1999 (note 5), 100–124.

[7] Justin Stagl, *Eine Geschichte der Neugier. Die Kunst des Reisens 1550–1800* (Wien, Köln and Weimar 2002), especially 167–175.

The "Scientific Revolution" of the seventeenth century owes something to this utopianism, even if the claim to own exercise of power was surrendered. In 1676 Gottfried Wilhelm Leibniz wrote, "My whole ambition has been to find a powerful ruler with greater than average intelligence; I believe there is nothing as beautiful and as noble in human affairs as great wisdom combined with great power."[8] One reads such statements today with a certain uneasiness. Leibniz did not question the ruler's right to existence; he asked that rulers be intelligent—indeed, that they have just the intelligence necessary to recognise the supremacy of the counsel he, Leibniz, gave them and to carry it out. The grey eminence behind a great power would thus be a great philosopher. The ruler's subjects would have to content themselves with the consolation of being ruled by the best of all possible systems, even if this system remained as unfathomable to them as divine providence. In reality, however, Leibniz succeeded only in counselling rulers of average intelligence, paying a high price for his proximity to power by making compromises and doing commissioned work.

The learned society movement—the founding of scientific academies and learned societies in the seventeenth and eighteenth centuries, in which Leibniz became a central figure—sought to establish reason as a criterion for spiritual and secular rulers—if not as a supreme authority, then at least as a final arbiter. Human power, like divine power, was to be exercised in conformity with scientific principles. In reality, these societies concerned themselves with meetings of scholars to whom a particular ruler offered—or upon whom he sometimes forced—his patronage. Reason did not subdue power here; the opposite was the case. Patrons were served by counsel and by deeds. In the Age of Reason it was certainly a mark of distinction for a ruler to have a learned society at his disposal. Hence the society could not keep its learning private; publication was a necessity.

Nonetheless, such proximity to power protected the learned societies from ecclesiastical meddling. During the Scientific Revolution, science and the state stood together in defence against the churches.[9] This offered scientists prestige, institutional continuity, and the opportunity to do major research. Scientists working independently would not have been able to circumnavigate the globe. However, benefits such as these were paid for

[8] Quoted in Liselotte Richter, *Leibniz und sein Russlandbild* (Berlin 1946), 45.

[9] Friedrich Tenbruck, *Die kulturellen Grundlagen der Gesellschaft. Der Fall der Moderne* (Opladen 1989), especially 89–211.

through accommodation. The Scientific Revolution advanced experimental research in the sciences as well as discovery of the earth, but research concerned with human society, which was more problematic politically, receded into the background. The counsel offered by these learned societies was more of a technical than a political nature. This narrowed the Solomonic-Platonic link between wisdom and experience-based knowledge to the latter; while science became specialised, political decisions were made elsewhere. Thus the Scientific Revolution, as well, failed to resolve the dilemma of power and reason.

Knowledge and insight on social issues, by contrast, was offered not by specialists but by independent intellectuals and was addressed to the literary public. This international, supra-denominational public offered leading intellectuals such as Leibniz, Locke, Montesquieu and Burke an opportunity to become public counsellors—successors to the prophets and the philosophers. A ruler values his counsellors for their usefulness in relation to his particular purposes. Public counsellors, however, were valued not for their usefulness but for their genius, i.e. quasi-supernatural personal qualities considered beneficial not only to statecraft but to humanity as such.

So far no distinction has been made here between different types of counsellors, although distinctions have been implied. In what follows, we shall distinguish among three types: the *advisor*, the *prophet*, and the *expert*.

The *advisor* has a personal relationship to the decision-maker who seeks his advice. In this situation he simultaneously represents those who are subject to the decisions taken. His advice is based on his own experience and worldly wisdom, but also on the experience derived from cases of precedent and the oral wisdom present in the community he represents. The biblical Ahithophel was such an advisor. Advisors of this sort can still be widely found today in situations where, despite bureaucratisation, power continues to be exercised personally; the American president has advisors of this sort. In addition to official advisors, there are also unofficial ones—favourites, individuals who have a leader's ear or, when they exist in groups, kitchen cabinets. It was said of King Farouk, Egypt's last royal ruler, that he frequently descended to the subterranean regions of the palace to meet with his chauffeurs, who offered him a pleasant type of non-demanding companionship but who in time became a corruptive influence as the monarchy's kitchen cabinet.

The *prophet* offers counsel to his community and its decision-makers on his own initiative, invoking the will of God or some other higher authority.

This personal relation to the supernatural authenticates his extraordinary personality, his charisma, and his genius. He also personally bears the risk that grows out of his pronouncements. His "public exegesis of Being" (Karl Mannheim)[10] transcends the existing world-view and can thus shift the parameters of decision-making situations. His counsel, which is rooted in a supernatural source of legitimacy independent of political power, accordingly has some of the qualities of a command. He exerts pressure through the effect he has on public opinion. By contrast with the prophets of ancient Israel, prophets in early modern history were also able to exert their influence indirectly through the printed word. Prophetic pronouncements allowed science to prevail over belief as the more reasonable explanation of the universe.[11] Mohammed Rassem comments in this respect: "Authority reaches out for science because it needs to reach out for 'prophecies' whether to control them, discredit them, or be supported by them."[12] For established churches, by contrast, new prophecies are dangerous. It was the alliance of scientific prophecy and the early modern state that brought forth the third type of counsellor—the expert.

The *expert* possesses specialised knowledge and skills, gained through formal education, which he henceforth makes available to society—whether private individuals or the state—for a fee. This takes place in the context of situations where counsel is sought and given. Normally, an expert does not issue orders; he offers advice. The trust expressed in him extends beyond his personal qualities to his authenticated status as an expert. Because experts are more numerous than advisors or prophets, their status is accordingly lower. On the other hand, no one else is qualified to meddle in their area of specialty except other experts in the same field, making them a closed profession. When those in power consult experts, it is generally through bureaucratic mediation, and the advice offered ("expertise", "advisory opinion") is given in writing. Pre-modern societies had such experts as well, but it was only in modern times that their education took on a scientific character and they were increasingly consulted in different life situations. This ensured a position in society for them as well as for their knowledge and abilities. Experts regard

[10] Karl Mannheim (referring to a formulation by Martin Heidegger) in *Verhandlungen des 6. Deutschen Soziologentages 1929*, quoted in Mohammed Rassem, 'Einige historische Exempla zum Thema Wissenschaft und Politik', in Hans Maier, Klaus Ritter and Ulrich Matz (eds.), *Politik und Wissenschaft* (München 1971), 357–385: 372.

[11] Tenbruck 1989 (note 9), especially 143–174.

[12] Rassem 1971 (note 10), 375.

anyone without the same level of education as a "layman"—including clerics and those in power, over whom they have the advantage of universal orientation, since the standards by which their performance is judged are scientific and thus universal. Accordingly, the impact of their advice is to further the scientification of human society. The modern world has been created in part by experts.

However, another shift of parameters now appears to be in the making. Indeed, early signs of it have been evident for a long time. Criticism was first voiced from religious and traditionalist quarters. Added to this were Swift's satires, Vico's historicism, and Hegel's concept of alienation. In the course of the nineteenth century the overly optimistic prophets of science were replaced by a new generation of prophets who joined in this criticism and made it their aim to unite the intellectual values of religious and traditional communities with scientific universalism. Most influential in this respect were Auguste Comte and Karl Marx.[13]

Both made claims to power on the grounds of their insights into human society. Although Comte's sociology continued to differentiate between power and reason, it nonetheless aimed—on the model of the Medieval church—to confront "worldly" powers as a new "spiritual force" that was now scientific as well. Marxism, by contrast, sought to synthesise power and reason in a new kingdom of philosophers, so to speak. Lenin, Stalin and Mao were the philosopher-kings of the twentieth century. Hitler, too, can be counted among them, even though he was not a product of Marxism but reacted against it, justifying his blend of modernism and criticism of modernism not scientifically but on the basis of his genius.[14]

That the modern philosopher-kings were unsuccessful in making good on their claim to merge reason and power can be seen in their mistrust of scientific expertise. None of them wanted to expose their notion of science to universal standards of evaluation. Each of them, in their own realm of power, persecuted experts who attempted to remain objective.[15] In doing so, they accepted damage to their systems of rule as part of the bargain—irreparable damage, as it was to turn out. This notwithstanding, the modern kingdom of philosophers exerted a powerful fascination

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[13] See Friedrich Jonas, *Geschichte der Soziologie II: Sozialismus, Positivismus, Historismus* (Reinbek bei Hamburg 1968).

[14] Mohammed Rassem, *Im Schatten der Apokalypse. Zur deutschen Lage* (Graz, Wien and Köln 1984), 116–144; see also Rassem 1971 (note 10), 368–370.

[15] See Dietrich Beyrau (ed.), *Im Dschungel der Macht. Intellektuelle Professionen unter Stalin und Hitler* (Göttingen 2000).

on intellectuals, who were all too eager to be seen as counsellors of the omnipotent. "So, Herr Heidegger, have you returned from Syracuse?" a cherished colleague is said to have asked the philosopher after disillusionment had set in.[16]

Today, after these systems of rule have collapsed, resentment against experts appears to be on the rise once more. Science is losing its position of final authority in the rich industrialised countries that would not be able to exist without it. Striving for objectivity is readily perceived as an attempt to exercise power by means of defining the situation—an attempt that needs to be unmasked.[17] In Luhmann's systems theory, science is only one of society's subsystems which, while it is certainly of use to other subsystems for purposes of education and counselling, is superior in no other respect.[18] The tenets of the "knowledge society" deny science even this equal status.[19] Accordingly, knowledge—not scientific knowledge but knowledge of all kinds—is necessary in every area of endeavour today, but can no longer be overseen and managed by a central agency.[20] "Knowledge" has thus become so common that we can no longer bear to hear the word and have resorted instead to other expressions, such as the now apparently inescapable term "competence". Rather than becoming concentrated at universities and other scientific institutions, this cognitive compound is now disseminating throughout innumerable "centres of expertise" and, inevitably, "centres of competence". As these agglomerations of knowledge and know-how are not too closely linked to each other, they are not subject to universal standards of evaluation. On the contrary: it is they, in the form of "evaluations" or "accreditation agencies", that evaluate scientific institutions.

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[16] Quoted in Carl Friedrich von Weizsäcker, *Der Garten des Menschlichen. Beiträge zur geschichtlichen Anthropologie* (München 1977), 410. The dear colleague is said to have been Wolfgang Schadewaldt, who certainly had something of a bad conscience himself.

[17] See, for example, Karl Acham, *Vernunftanspruch und Erwartungsdruck. Studien zu einer philosophischen Soziologie* (Stuttgart-Bad Cannstatt 1989).

[18] Niklas Luhmann, *Die Wissenschaft der Gesellschaft* (Frankfurt/M. 1990).

[19] A good summary can be found in Helmut Willke, 'Wissensgesellschaft', in Georg Kneer, Armin Nassehi and Markus Schroer (eds.), *Klassische Gesellschaftsbegriffe der Soziologie* (München 2001), 379–398. Scathing criticism is provided in Konrad Paul Lissmann, *Theorie der Unbildung. Die Irrtümer der Wissensgesellschaft* (Wien 2006).

[20] See Dariusz Aleksandrowicz and Karsten Weber (eds.), *Kulturwissenschaften im Blickfeld der Standortbestimmung, Legitimierung und Selbstkritik* (Berlin 2007); especially Jan Radler, 'Realismus und Relativismus in Feyerabends Spätphilosophie—eine kritische Rekonstruktion', 213–232.

Anyone who does not dismiss this as a sign of the times but sees it in context will be unable to shake off the suspicion that the horizon is growing darker for science. Science, in the course of time from early modern history through the modern period and into the post-modern era, seems to have exhausted its potential and thus died of its own success.

Basic research and disciplines that still require training and education or that cannot be modularised due to their structure are running out of funds, which are used instead for prestige projects, politically desirable pseudo-disciplines, and improvised courses of study. University courses have become less demanding, more enjoyable, more closely related to practice and, thanks to the efforts of the educational bureaucracy, widely compatible. They also take longer. But in the end one must ask what has actually been learned. The boundaries between experts and laymen are becoming blurred, obscuring the difference between reason and power as a consequence. And this is occurring not through the higher process of harmony sought by the modern prophets but by the subordination of science to practice. The levelling of science, whereby it has become one form of life among others, has resulted, in the words of Dariusz Aleksandrowicz, "in a turning away from the particular achievements and the uniqueness of scientific appropriation of the world and a return to primitive forms of cognition."[21] A "primitivisation" diametrically opposed to technical and industrial progress was already observed by Arnold Gehlen.[22] Today sociologists as little suspected of nostalgia as Jürgen Habermas and Ulrich Beck characterise this same situation, respectively, as the "new obscurity"[23] and "organised irresponsibility".[24]

One might conclude that the age of scientific experts has now come to at an end and that a new type of counsellor is emerging. Yet it is probably too early to speak of a twilight of experts. Experts are still among us; we require them for our security and comfort. Indeed, there are more experts today than ever before. But the attacks on science described above mean that their intellectual home is being threatened. Who is not seen as an expert nowadays? And this is not even counting those who have completed politically desirable and improvised courses of study. Yet because

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[21] Dariusz Aleksandrowicz, 'Die kulturwissenschaftliche Erkenntnisauffassung als Regress zum primitiven Denken', in Aleksandrowicz and Weber 2007 (note 20), 45–88: 73.

[22] Arnold Gehlen, *Die Seele im technischen Zeitalter. Sozialpsychologische Probleme in der industriellen Gesellschaft* (Reinbek bei Hamburg 1957), 33–35.

[23] Jürgen Habermas, *Die neue Unübersichtlichkeit. Kleinere politische Schrifen 5* (Frankfurt/M. 2006).

[24] Ulrich Beck, *Gegengifte. Die organisierte Unverantwortlichkeit* (Frankfurt/M. 1988).

such numbers" of experts of every description exist, it is easier for their ranks to be penetrated by gurus and charlatans who are not interested in objective analysis but in exploiting situations where counsel is sought and given for their own purposes. Meanwhile, recent crises have illustrated that not everything is permissible in counselling contexts either, and that even gurus and managers are not capable of everything. Postmodern resentment against scientific experts has so far had only destructive effects and offered nothing constructive. It is impossible to perceive what might replace the authority of science or where the parameters of future political decision-making might be shifted.

USEFUL NATURAL HISTORY? PEST CONTROL IN THE FOCUS OF THE ECONOMIC SOCIETY OF BERN

Martin Stuber and Regula Wyss

Many scientific disciplines in the eighteenth century were increasingly oriented towards the needs of practice. This new understanding of science was linked to a utilitarian concept of nature, economic ideas about raising productivity, and political ideas focused on increasing prosperity and promoting "common weal" [Glückseligkeit]. The economic and patriotic societies that arose throughout Europe primarily in the second half of the eighteenth century emerged from this fundamental process of transformation into modernity, of which they were simultaneously the driving force.[1] The Economic Society of Bern [Oekonomische Gesellschaft Bern], founded in 1759, was one of the most important of these societies, not least because of its dual-language publication organ, which was read

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[1] André Holenstein, Martin Stuber and Gerrendina Gerber-Visser (eds.), *Nützliche Wissenschaft und Ökonomie im Ancien Régime. Akteure, Themen, Kommunikationsformen* (Heidelberg 2007); regarding the European movement, see Marcus Popplow (ed.), *Landschaften agrarisch-ökonomischen Wissens. Strategien innovativer Ressourcennutzung in Zeitschriften und Sozietäten des 18. Jahrhunderts* (Münster 2010); Torsten Meyer and Marcus Popplow, '"To Employ Each of Nature's Products in the Most Favourable Way Possible"—Nature as a Commodity in Eighteenth-Century German Economic Discourse', *Historical Social Research / Historische Sozialforschung* 29 (2004), 4–40; Rudolf Schlögl, 'Die patriotisch-gemeinnützigen Gesellschaften. Organisation, Sozialstruktur, Tätigkeitsfelder', in Helmut Reinalter (ed.), *Aufklärungsgesellschaften* (Frankfurt/M. 1993), 61–81; Henry E. Lowood, *Patriotism, Profit and the Promotion of Science in the German Enlightenment. The Economic Scientific Societies 1760–1815* (New York and London 1991); see also the contribution by Holger Böning in this volume.

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throughout Europe.[2] Its typical actor was the learned magistrate who was simultaneously a technical expert, a political reformer, and an administrator with executive responsibilities. In the period up to 1800, approximately two-thirds of a total of 120 regular members and 67 subscribers of the society gained a seat in the Great Council of Bern and were thus political decision-makers.[3] A second key actor group consisted of clerics, who dominated the affiliated societies [Zweiggesellschaften] scattered throughout the entire territory of Bern with a total of 228 members, and also served as local representatives of the parent society.[4] A total of 192 honorary members comprised a third actor group, consisting of internationally prominent personalities as well as meritorious members of the affiliated societies.

Natural History of the "Useful" and the "Harmful"

In his synthetic study of economic and patriotic societies in Germany, Henry E. Lowood emphasised that the focus of their work from the 1770s began to be dominated by natural history. The principal reason he cited was that these societies realised that economic development would not be achieved without better knowledge of natural history.[5] The study of natural history had been a priority of the Economic Society of Bern since its founding. As part of its comprehensive programme of work in support of agriculture, forestry, commerce and trade (1762), the Society devoted approximately 80 studies to questions concerning "the natural

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[2] Martin Stuber et al. (ed.), *Kartoffeln, Klee und kluge Köpfe. Die Oekonomische und Gemeinnützige Gesellschaft des Kantons Bern OGG (1759–2009)* (Bern 2009); Daniel Salzmann, *Dynamik und Krise des ökonomischen Patriotismus. Das Tätigkeitsprofil der Oekonomischen Gesellschaft Bern 1759–1797* (Nordhausen 2009); Conrad Bäschlin, *Die Blütezeit der Ökonomischen Gesellschaft zu Bern 1759–1766* (Laupen 1917).

[3] On the group of members who were magistrates, see Regula Wyss and Martin Stuber, 'Paternalism and Agricultural Reform: The Economic Society of Bern in the Eighteenth-Century', in Koen Stapelbroek and Jani Marjanen (eds.), *The Rise of Economic Societies in the Eighteenth Century: Patriotic Reform in Europe and North America* (Basingstoke 2012), 157–181.

[4] On the group of members who were clergymen, see Regula Wyss and Gerrendina Gerber-Visser, 'Formen der Generierung und Verbreitung nützlichen Wissens. Pfarrherren als lokale Mitarbeiter der Oekonomischen Gesellschaft Bern', in Holenstein et al. 2007 (note 1), 41–64; Regula Wyss, *Pfarrer als Vermittler ökonomischen Wissens? Die Rolle der Pfarrer in der Oekonomischen Gesellschaft Bern im 18. Jahrhundert* (Nordhausen 2007).

[5] Lowood 1991 (note 1), 279–281.

history of the internal and external fruits of the land and the animals that it nourishes."[6]

The Economic Society implemented this comprehensive plan at several levels. Topographic descriptions captured information on current conditions and available development potential for specific districts or regions; in addition to economic and ethnographic information, they also contained findings from the realm of natural history concerning climate and wind conditions, rocks and minerals, large and small fauna, weeds, and pests.[7] Moreover, the Economic Society compiled systematic catalogues of specific categories of local raw materials. One example was the catalogue of mineral resources in the territory of Bern, published by the clerk [Landschreiber] Gottlieb Sigmund Gruner.[8] The major output, however, was an inventory of current and potential plant resources that comprised eleven systematic catalogues listing a total of 650 species of "useful" wild and cultivated plants. Based on scientifically systematised nomenclature, this inventory contained native species or varieties as well as foreign ones with a potential for ecesis.[9] Albrecht von Haller, who was president of the Society for several years, played a key role in this major undertaking.[10]

The universal scholar was committed not only to the search for the "useful", however, but also sought to combat what was "harmful". During a European-wide livestock epidemic, Haller published a strategy for controlling the epidemic in the publication organ of the Society; he then

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[6] 'Entwurf der vornehmsten Gegenstände der Untersuchungen, zur Aufnahme des Feldbaues, des Nahrungsstandes und der Handlung', *Abhandlungen und Beobachtungen gesammelt durch die oekonomische Gesellschaft zu Bern* [hereafter *AB*] (1762), no. 1, 1–54: 7–16.

[7] Gerrendina Gerber-Visser, *Der ökonomisch-patriotische Blick. Statistik und Volksaufklärung in den Topographischen Beschreibungen der Oekonomischen Gesellschaft Bern*, dissertation, University of Bern (Bern 2009).

[8] Gottlieb Sigmund Gruner, 'Anzeige der bishiehin in der Landschaft Bern entdeckten Mineralien', *AB* (1767), no. 1, 165–254; see Alex Cooper, '"The Possibilities of the Land": The Inventory of "Natural Riches" in the Early Modern German Territories', in Margaret Schabas and Neil de Marchi (eds.), *Oeconomies in the Age of Newton* (Durham and London 2003), 129–153.

[9] Martin Stuber and Luc Lienhard, 'Nützliche Pflanzen. Systematische Verzeichnisse von Wild- und Kulturpflanzen im Umfeld der Oekonomischen Gesellschaft Bern', in Holenstein et al. 2007 (note 1), 65–106; Martin Stuber, 'Kulturpflanzentransfer im Netz der Oekonomischen Gesellschaft Bern', in Regina Dauser et al. (eds.), *Wissen im Netz. Botanik und Pflanzentransfer in europäischen Korrespondenznetzen des 18. Jahrhunderts* (Augsburg 2008), 229–269.

[10] Martin Stuber and Regula Wyss, 'Der Magistrat und ökonomische Patriot', in Hubert Steinke, Urs Boschung and Wolfgang Proß (eds.), *Albrecht von Haller. Leben—Werk—Epoche* (Bern 2008), 347–380: 362–368.

successfully implemented the strategy in his role as health councillor [Sanitätsrat].[11] Just how closely economic and patriotic natural history was, overall, linked with the "useful/harmful" dichotomy was illustrated by a lecture on the status of this science delivered by the pastor and scholar Jakob Samuel Wyttenbach on 25 March 1781 at a gathering of the Economic Society of Bern.[12] Natural history, according to Wyttenbach, teaches us to distinguish the entire "inventory of creatures" from one another with precision and accuracy, in terms of whether they can be used "for pleasure and benefit" or should be repelled "as foes and harmful destroyers of our toil." Although he emphasised at the outset that the "influence of natural history on the welfare of society" was so clear and convincing that he need give no further examples of it, he proceeded to do precisely that in the course of his lecture. He justified the study of natural history on the basis of its economic benefits, as a result of which it was more than just an object of "mere curiosity" that served as a "pleasurable and trifling pastime" for gentlemen of leisure. Natural history was nothing less than the "basic science of farming, livestock husbandry, the arts, human activity, and generally the processing of all materials that busy human hands." Wyttenbach's plea naturally contained some physico-theological ideas, according to which the study of nature is also a way to "knowledge of the Almighty, the most wise and supreme Creator", who wished to instruct humans through "the beauty of his works, the wisdom of his world order, and the fatherly benevolence of all his aims."[13] In the context of human society, however, Wyttenbach focused on justifying natural history solely in terms of usefulness. The "insect expert" was frequently ridiculed for collecting caterpillars, hunting butterflies, and breeding tiny beetles and preserving them carefully in his collections. The "plant collector", by contrast, was far less subject to such mockery, as everyone was aware of the value of precise knowledge about medicinal plants. Yet this view ignored

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[11] Albrecht von Haller, 'Abhandlung von der Viehseuche', *AB* (1772), no. 2, 49–79. See Martin Stuber and Regula Wyss, 'Die Bekämpfung der Viehseuche 1772/73', in André Holenstein et al. (eds.), *Berns goldene Zeit. Das 18. Jahrhundert neu entdeckt* (Bern 2008), 71–73.

[12] Jakob Samuel Wyttenbach, 'Betrachtungen über den gegenwärtigen Zustand der Naturgeschichte Helvetiens und insbesondere des Kantons Bern', *Magazin für die Naturkunde Helvetiens* II (1788), 1–22; see Martin Stuber 'Epilog: "Die Abgaben der Natur zu vervielfältigen"', in Holenstein et al. 2008 (note 11), 135–139.

[13] See for example Wolfgang Wiegrebe, *Albrecht von Haller als apologetischer Physikotheologe. Physikotheologie: Erkenntnis Gottes aus der Natur* (Frankfurt/M. et al. 2009); Robert Felfe, *Naturgeschichte als kunstvolle Synthese. Physikotheologie und Bildpraxis bei Johann Jakob Scheuchzer* (Berlin 2003).

the fact that the investigations undertaken by experts on insects were "the best means for understanding harmful insects, preventing their reproduction, and eradicating them."[14]

Wyttenbach's argumentation was made against the background of a relatively low level of institutionalised science in Bern at this time. When it came to applied science, the members of the Economic Society of Bern regularly cited the example of Sweden, where an influential group associated with the botanist Carl von Linné and the Academy of Sciences had been working towards more intensive use of local resources on a scientific basis since the 1730s.[15] The great appeal of the example of Sweden was also evident in relation to pest control. In the collections of selected translations of Swedish papers dealing with political economy, natural science and agriculture, which were published with the support of the Economic Society of Bern, there is a revealing passage on this subject by Carl von Geer, President of the Swedish Academy of Sciences for many years: "It is a pressing matter for us to discover ways to banish these harmful insects. This requires knowledge of their nature and their characteristics; what they favour or eat, at what time they reproduce, etc. These things alone should encourage us to investigate these insects."[16]

Although the members of the Economic Society had objectives very similar to those of their Swedish colleagues, they faced very different institutional conditions. Whereas applied natural history in Sweden was supported by a state-financed scientific academy, a state-financed botanical garden, and state-financed research trips, all of these things were nonexistent in Bern. At the time the Economic Society was founded (1759) there were no proper scientific institutions, with the singular exception of the "Hohe Schule", an institution of higher learning that concentrated primarily on educating clergymen and jurists. It was only in the following

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[14] Wyttenbach 1788 (note 12), 5–6.

[15] [Vinzenz Bernhard Tscharner], 'Vorrede', *AB* (1762), no. 1, I–XLI: XX–XXI; see Stuber and Lienhard 2007 (note 9), 67–71; on Sweden, see Lisbet Körner, *Linnaeus: Nature and Nation* (Cambridge 1999); Gerlinde Hövel, *"Qualitas vegetabilium", "vires medicamentorum" und "oeconomicus usus plantarum" bei Carl von Linné (1770–1778). Erste Versuche einer zielgerichteten Forschung nach Arznei- und Nutzpflanzen auf wissenschaftlicher Grundlage* (Stuttgart 1999).

[16] Carl von Geer, 'Rede von dem Nutzen den die Insekten und die Untersuchung derselben uns verschaffen; gehalten vor der königl. schwedischen Akademie der Wissenschaften den 18. April 1744', *Auserlesene Sammlung zum Vortheil der Staatswirthschaft, der Naturforschung, und des Feldbaues, mit Beyfall der löbl. oekonomischen Gesellschaft in Bern; aus dem Schwedischen übersetzt von Gottlieb Sigmund Gruner* 2 (1769), 1–24: 22.

decades that the Society of Natural Science [Naturforschende Gesellschaft, 1786], the Botanical Garden (1789), the Bernese Academy (1805), the agricultural school in Hofwyl (1808) and, above all, the University of Bern (1834) were founded.

Combating "Prejudice" and "Idleness"

Agro-economic reform projects in the eighteenth century focused as much on reducing damage and loss as they did on increasing production. According to Günter Bayerl, not only was "useful nature" discovered in the eighteenth century; it was also "the century of the discovery of pests."[17] However, a long time elapsed before work concerned with the latter received due attention from historians. With a few exceptions, it was only in recent years that publications on pest control in early modern times[18] or even in the nineteenth and twentieth centuries[19] began to

[17] Günter Bayerl, 'Die Natur als Warenhaus. Der technisch-ökonomische Blick auf die Natur in der Frühen Neuzeit', in Sylvia Hahn and Reinhold Reith (eds.), *Umwelt-Geschichte. Arbeitsfelder—Forschungsansätze—Perspektiven* (Wien et al. 2001), 34–51: 45; regarding Bayerl's research concept of "economisation of nature", which largely corresponds to the application-oriented natural history practised by the Economic Society of Bern, see also Günter Bayerl and Torsten Mayer, 'Glückseligkeit, Industrie und Natur—Wachstumsdenken im 18. Jahrhundert', in Günter Bayerl, Norman Fuchsloch and Torsten Meyer (eds.), *Umweltgeschichte—Methoden, Themen, Potentiale* (Münster et al. 1996), 135–158: 143; in relation to the economic and patriotic societies: Meyer and Popplow 2004 (note 1).

[18] Christoph Reichmuth, 'Vorratsschädlinge und Vorratsschutz im Wandel der Zeit', in Bernd Herrmann (ed.), *Beiträge zum Göttinger Umwelthistorischen Kolloquium 2008–2009* (Göttingen 2009), 17–76; Katharina Engelken, Dominik Hünniger and Steffi Windelen (eds.), *Beten, Impfen, Sammeln. Zur Viehseuchen- und Schädlingsbekämpfung in der Frühen Neuzeit* (Göttingen 2007); Bernd Herrmann, 'Zur Historisierung der Schädlingsbekämpfung', in Torsten Meyer and Marcus Popplow (eds.), *Technik, Arbeit und Umwelt in der Geschichte. Günter Bayerl zum 60. Geburtstag* (Münster et al. 2006), 317–338; Christian Rohr, Zur Wahrnehmung, Deutung und Bewältigung von Heuschreckenplagen in Mitteleuropa im Spätmittelalter und in der Frühen Neuzeit, in Thoralf Klein et al. (ed.), *Umweltgeschichte in globaler Perspektive* (Erfurt 2011, www.db-thueringen.de/servlets/DerivateServlet/Derivate-23892/Rohr_Heuschreckenplagen.pdf); Jutta Nowosadtko, 'Die policierte Fauna in Theorie und Praxis. Frühneuzeitliche Tierhaltung, Seuchen- und Schädlingsbekämpfung im Spiegel der Policeyvorschriften', in Karl Härter (ed.), *Policey und frühneuzeitliche Gesellschaft* (Frankfurt/M. 2000), 297–340; Verena Winiwarter (ed.), *Bodenfruchtbarkeit und Schädlinge im Kontext von Agrargesellschaften* (Wien 1998).

[19] Lukas Straumann, *Nützliche Schädlinge. Angewandte Entomologie, chemische Industrie und Landwirtschaftspolitik in der Schweiz 1874–1952* (Zürich 2005); Sarah Jansen, *"Schädlinge". Geschichte eines wissenschaftlichen und politischen Konstrukts 1840–1920* (Frankfurt/M. and New York 2003).

appear. These more recent studies can be read from the perspective of a broad history of knowledge that analyses multiple interactions between different types of knowledge—daily experience, administrative know-how, technology, and science. This provides a stimulating backdrop for examining the question that will subsequently be taken up here: the extent to which natural history was actually fundamental for the development of pest control practices. In particular, no assumptions should be made about a history of linear progress in which the rationality of economic and patriotic science gradually prevailed over the irrationality of the peasantry. Of greater interest is the notion of open dynamics among different types of knowledge, concerned with conflict between different value systems at the cultural level and distribution of labour, goods and competence at the material level.[20]

The portion of the work plan of the Economic Society for 1762 concerned with natural history contains numerous research questions on agricultural pests [vermin]: which are the most harmful pests in the country and which appear at certain periodic intervals? Which ones keep to particular plants, on which they feed? Which species attack our seeds, grass species, different crops and vines in certain years? Which ones do damage to the leaves and the wood of trees?[21] And finally: which pests and wild animals are found in each district, and how can they be repelled and how annihilated?[22] The Economic Society could not fully implement this comprehensive programme, of course, either in general or with particular reference to pests. A systematic search of the written statements of the Economic Society for references to pests initially reveals an impressive list:

[20] See for example André Holenstein, 'Industrielle Revolution avant la lettre. Arbeit und Fleiss im Diskurs der Oekonomischen Gesellschaft Bern (2. Hälfte 18. Jahrhundert)', in Holenstein et al. 2007 (note 1), 17–40; Holger Böning, Hanno Schmitt and Reinhard Siegert (eds.), *Volksaufklärung. Eine praktische Reformbewegung des 18. und 19. Jahrhunderts* (Bremen 2007); Holger Böning, 'Popularaufklärung—Volksaufklärung', in Richard van Dülmen and Sina Rauschenbach (eds.), *Macht des Wissens. Die Entstehung der modernen Wissensgesellschaft* (Köln, Weimar and Wien 2004), 563–581; Hubert Steinke, 'Die Einführung der Kartoffel in der Waadt 1740–1790. Agrarmodernisierung aus bäuerlicher Sicht', *Zeitschrift für Agrargeschichte und Agrarsoziologie* 45 (1997) 15–39.

[21] Entwurf 1762 (note 6), 15–16.

[22] Ibid., 14.

– Ants [Ameisen][23]
– hive beetles [Bienenbauschaben], bee lice [Bienenläuse], wax moths [Bienenbaumotten][24]
– plant lice [Blattläuse][25]
– blight [Brand], mildew [Mehltau], rust [Rost][26]
– flea beetles [Erdflöhe][27]
– mole crickets [Erkrebse, Maulwurfsgrillen, Werren][28]
– hares [Hasen][29]
– woodworms [Holzwürmer][30]
– grain worms [Kornwürmer][31]

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[23] 'Vollständige Anleitung zu der Pflanzung und Wartung der Fruchtbäume aus Hrn. Ph. Millers grossem englischem Gärtner-Lexiko', *Sammlung auserlesener Schriften von Staats- und landwirthschaftlichem Inhalte. Mit beyfall einer löbl. Oekonomischen Gesellschaft zu Bern herausgegeben* (1764), 1–341: 337; Prämie 'Erfindung eines tüchtigen Mittels, die Fruchtbäume vor den Ameisen und dem Meelthau zu bewahren', *AB* (1772), no. 1, XXII; 'Über Vertilgung der Ameisen, Schaben und Wanzen', *Gemeinnützige Nachrichten und Bemerkungen besonders für Freunde der Naturgeschichte und der Landwirthschaft; herausgegeben auf Veranstaltung der physisch-oekonomischen Gesellschaft in Bern* [hereafter *GN*] (1798), no. 2, 161–176.

[24] Cathérine-Elisabeth Vicat-Curtat, 'Anmerkungen über die Bienen, falschen Motten und Läuse', *AB* (1764) no. 1, 79–126: 82 and 118–120; id., 'Versuche eines neuen Mittels zu Vermehrung der Bienenschwärme', *AB* (1769), no. 2, 93–108.

[25] 'Meteorologische Tabellen vom Jenner, Hornung, März, April, Mäy und Junius 1763', *AB* (1763), no. 3, 205–231: 226.

[26] J. Giauque, 'Abhandlung ansehend den Landbau auf dem Tessenberg', *Der schweitzerischen Gesellschaft in Bern von landwirthschaftlichen Dingen* [hereafter *SG*] (1760), no. 2, 444–464: 460–464; Johann Ludwig Stürler, 'Schreiben des Herrn Stürlers von Cottens, über die Weise, den Brand im Getreid zu verhüten', *SG* (1760), no. 4, 896–912; Niklaus Emanuel Tscharner, 'Von dem Brand und dem Rost im Getreide', *AB* (1762), no. 2, 25–40; [N.N.], 'Anzeige einer leichten Zubereitung des Getreides, um die Saat vor dem Mehltau und dem Brand zu verwahren', *AB* (1764), no. 2, 41–59; [N.N.], 'Brief eines Correspondenten über den Brand im Getreide', *AB* 1 (1768), 138–141; [N.N.], 'Nachricht an das Landvolk vom Brand im Getreide', *Neue Sammlung physisch-oekonomischer Schriften* [hereafter *NS*] (1785), 215–244; Prämie 'die besten durch die Erfahrung bewährt erfundenen Mittel, den Rost im Getreide zu verhüten', *AB* (1768), XXXIII.

[27] Louis François Henri de Menon de Turbilly, 'Abhandlung von dem Reps, Rübsame oder Levat', *AB* (1762), no. 3, 209–226: 222; Johann Rudolf Tschiffeli, 'Flachsbau mit untermengtem Türkenkorne', *AB* (1763), no. 1, 193–198: 197.

[28] 'Auszug aus dem vierten Theil Hannövrischer Nützlicher Sammlungen von 1759', *SG* (1761), no. 2, 409; [N.N.], 'Mittel Wie die Erdkrebse [Wären] zu vertreiben', *AB* (1766), no. 4, 164–165; Niklaus Anton Rudolf Holzer, *Beschreibung des Amtes Laupen 1779*, ed. by Hans A. Michel (Bern 1984), 36; Niklaus Emanuel Tscharner, 'Physisch-oekonomische Beschreibung des Amts Schenkenberg', *AB* (1771), no. 1, 101–220: 118.

[29] Menon de Turbilly 1762 (note 27), 222; 'Meteorologische Tabellen, und landwirthschaftliche Beobachtungen, vom Jenner, Hornung, März, Aprill, May und Brachmonat 1767', *AB* (1768), no. 1, 171–207: 176 and 188.

[30] Niklaus Emanuel Tscharner, 'Abhandlung von der Natur, Wartung und Nutzung der Buche', *SG* (1760), no. 3, 682–724: 721.

[31] See below.

- cockchafers [Maikäfer], cockchafer grubs [Engerlinge][32]
- moles [Maulwürfe][33]
- mice [Mäuse][34]
- caterpillars [Raupen][35]
- cockroaches [Schaben][36]
- snails [Schnecken][37]
- birds [Vögel]: finches [Finken], sparrows [Sperlinge], ravens [Raben], partridges [Rebhühner][38]
- bugs [Wanzen][39]
- wasps [Wespen], hornets [Hornissen][40]

For not a few of these species classification as "useful" or "harmful" was not fixed but varied, depending on the context. The Economic Society's affiliate in the Aargau reported in 1767 that hares invaded the pits where "carrots and cabbages" were stored,[41] and because the snow was so high, they had even damaged espalier trees around farmhouses by gnawing their branches.[42] Niklaus Emanuel Tscharner, by contrast, characterised the hare as a valuable resource: "Hares are many, and they are the best tasting in the country", he wrote in 1771 in reference to his district of Schenkenberg.[43] Birds,

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[32] Miller 1764 (note 23), 340–341; Prämie 'demjenigen, der ein probhältiges Mittel anzeigen wird, die weissen Käfer (Ingern) von einem Stük Landes zu vertreiben oder abzuhalten', *AB* (1768), no. 1, XXXI; [N.N.], 'Von dem Maykäfer', *Gemeinnützige Nachrichten und Bemerkungen besonders für Freunde der Naturgeschichte und der Landwirtschaft; auf Veranstaltung der oekonomischen Gesellschaft in Bern herausgegeben* [hereafter *GN*] (1796), 97–102; [N.N.], 'Vertilgung der Käfer', *GN* (1797), 33–48.

[33] Alexander Wildermett, 'Topographische Beschreibung des Bieler-Sees und der umliegenden Landschaft, insbesondere der Herrschaft Erguel', *AB* (1768), no. 2, 143–179 and 160–161; Holzer 1984 (note 28), 35; Jean Bertrand, 'Anfangsgründe des Landbaues auf Erfahrungen und Vernunft gegründet, zum Gebrauche des Landvolks; eine gekrönte Preisschrift', *AB* (1773), 1–154: 136.

[34] Holzer 1984 (note 28), 35; Prämie 'auf das dienlichste Mittel die Feldmäuse zu vertreiben' (1774), *NS* (1782), LVI.

[35] Vollständige Anleitung 1764 (note 23), 338–339.

[36] Preis 'auf die beste Abhandlung über die Vertilgung der Schaben, besonders der bey uns in der Hauptstadt immer schädlicher werdenden Art, die nicht nur wollene, sondern auch seidene Zeuge angreift, und besonders den mit Pferdehaaren ausgestopften Mobilien so gefährlich ist', *GN* (1796), no. 1, 14f.; [N.N.], 'Vertilgung der Schabe', *GN* (1797), 51–52.

[37] Tschiffeli 1763 (note 27), 197–198; Tscharner 1771 (note 28), 118.

[38] Johann Rudolf Tschiffeli, 'Nachricht von dem sehr nüzlichen Anbaue des Moorhirses', *AB* (1763), no. 1, 233–239: 235; 'Beyträge von der Oeconomischen Gesellschaft zu Nydau für das Jahr 1764', *AB* (1765), no. 1, LI–LXX: LVII–LVIII; 'Ein bewährtes Mittel die Vögel von Weinstöcken, Hopfäckern (Beunden) u. dergl. zu verscheuchen', *GN* (1797), 188–189.

[39] [N.N.], 'Gegen die Wanzen', *GN* (1796), 144.

[40] [N.N.], 'Ein Mittel die Wespen und Hornissen zu vertilgen', *GN* (1796), 32.

[41] *AB* (1768), no. 1, 176.

[42] *AB* (1768), no. 1, 188.

[43] Tscharner 1771 (note 28), 117.

too, could be either "pests" or "useful" animals. There were complaints about "ravenous birds" such as finches and sparrows that "plucked entire beakfuls" from millet fields[44] or "extraordinary numbers" of ravens that devoured the spring seed on freshly sown fields.[45] On the other hand, as will be seen below, certain bird species were regarded as useful animals when, for instance, they devoured cockchafers. Even among insects—the classic pests in our context—useful qualities in certain species were sought out as a basis for the production of food, medicines, textiles, and general household articles. This extended beyond bees and silkworms to include such insects as ants, flies, grasshoppers and wasps.[46]

The most important elements in the discourse on pests in the Economic Society can be found in condensed form in a treatise on control of the mole cricket, an insect about 5 cm in length that attacks vegetable cultures, grain crops, and the roots of potato tubers.[47] Unfortunately, according to this document, there was negligence in the pursuit of "harmful insects, caterpillars, grub-worms, moles, etc." Out of "prejudice or idleness" farmers allowed these "little foes" to go unpunished while they caused "the greatest devastation", although it would be easy to contain them. It was hoped that the instructions provided in the treatise would raise awareness among farmers and show them that the efforts they made to "destroy these insects" would be rewarded by the benefits they would receive. Moreover, the treatise called for the police being mandated to see that "all-out war was declared" on these enemies, as part of the objective was to ensure that they did not "spread from the fields of the idle to the fields of hard-working landowners."[48] In the view of the Economic Society of Bern, therefore, it was necessary to make pests a field of knowledge, labour, and administration. The extent to which natural history was a basis for this endeavour will now be analysed further, using two case studies focusing on cockchafers and grain worms, respectively.

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44 Beyträge Nydau 1765 (note 38), LVIII.

45 'Meteorologische Tabellen von Bern vom Januario, Februario und Martio, 1760', *SG* (1760), no. 2, 470–484: 483.

46 Geer 1769 (note 16).

47 [N.N.], Mittel 1766 (note 28), 164–165.

48 Ibid., 165.

Combating the Cockchafer

In his topographical description of the district of Laupen (1779), Rudolf Holzer described the life cycle of the cockchafer and the destruction it caused: as a grub under the ground, it devoured the roots of grasses, damaging hay aftermath in the first year and spring hay in the second; in the third year, as a beetle, it damaged the flowers, leaves and fruits of trees.[49] Unfortunately, however, no one was concerned with protection against this "devastation"; instead, cockchafers were protected by "superstition". According to Holzer, a farmer reckoned it was his merit "when he sacrifices his efforts and the sweat of his brow to an evil that he understands to be a punishment from Heaven, without grumbling."[50] Niklaus Emanuel Tscharner advanced a similar argument in his topographical description of the district of Schenkenberg (1771), where he served as bailiff [Landvogt]. Also briefly describing the three-year cycle of the cockchafer, he launched an outright tirade against the superstitious and negligent farmers: according to him, they believed it was practically a "sin" to go after the cockchafer, and, in addition, thought this a waste in terms of time and costs; instead, they preferred to arm themselves with "stoic disinterest".[51]

The course pursued by the Economic Society in controlling the cockchafer comes into clearer focus if placed in a longer-term context. In 1479 the Bishop of Lausanne anathematised the Bernese cockchafer, a widespread practice at that time.[52] In 1689 the Bernese authorities issued their first ordinance concerning cockchafers [Käfer-Mandat], which was subsequently revised numerous times (1690, 1693, 1708, 1726, 1749).[53] They

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[49] See S. Keller, 'Biologie', in Rudolf Büchi et al. (eds.), *Neuere Erkenntnisse über Maikäfer* (Frauenfeld 1986), 12–24: 13–15.

[50] Holzer 1984 (note 28), 35.

[51] Tscharner 1771 (note 28), 118.

[52] Catherine Chène, *Juger les vers: exorcismes et procès d'animaux dans le diocèse de Lausanne (XV^e–XVI^e s.)* (Lausanne 1995); on medieval animal trials in general, see Peter Dinzelbacher, *Das fremde Mittelalter. Gottesurteil und Tierprozess* (Essen 2006); Leo Zehnder, *Volkskundliches in der älteren schweizerischen Chronistik* (Basel 1976), 410–412; on the general history of cockroaches in the canton of Bern, see Walter Bieri, 'Die Maikäfer im Oberaargau', *Jahrbuch des Oberaargaus* 9 (1966), 59–69; Ulrich Freudiger, 'Von der Bekämpfung und Naturgeschichte des Maikäfers in alter Zeit', *Berner Zeitschrift für Geschichte und Heimatkunde* (1949), 169–179; Johannes Strickler, 'Von den Maikäfern', *Landwirthschaftliches Jahrbuch* (1908), 723–738; Samuel Studer, 'Einige Bemerkungen und Fragen, die Maikäfer betreffen', *Naturwissenschaftliche Anzeigen* 1 (Bern 1818), 19–23.

[53] 'Anstallten, das Ungezeiffer ausszureüten' (22.2.1689), in *Rechtsquellen des Kantons Bern*, ed. by Hermann Rennefahrt (Aarau 1866), 820–822 (under "Erster Teil, Stadtrechte, 8.2 Das Stadtrecht von Bern VIII, 2, Wirtschaftsrecht"); *Repertorium der Policeyordnungen*

justified this step by stating that the "all too rampant vermin" were not only causing the peasants to suffer damage but also diminishing the authorities' tithe revenue. The following specific regulations were issued:

1) Each household head was obligated to see that someone followed after the plough to collect unearthed grubs, especially on enclosed land where swine and geese could not reach them. Control was to be exercised by the "village head" [Dorfmeister or Vierer], who had to burn the grubs collected and could also order anyone failing to collect grubs conscientiously to be charged with the costs of having it done and pay a fine in addition.
2) Cockchafers were to be shaken from trees and hedges, put into sacks, placed in water, and subsequently measured and burned by the designated overseer. Each household was to deliver as many *Mäss*[54] as there were persons over the age of ten in the household. Additional amounts were to be compensated with a *silver coin* (*Kreuzer*) *per Mäss* by the authorities. Designated overseers could also order anyone failing to collect chafers conscientiously to be charged with the costs of having it done and pay a fine in addition.
3) As the insects were decimated in no small measure by finches and titmice who fed on them, hunting of finches was completely forbidden, while in the case of titmice a limited prohibition forbade "any excessive shooting and capture."

Revision of precisely this decree was pending when a letter from the authorities was read at a meeting of the Economic Society on 28 July 1770, "in which the Society was asked to provide advice about the best possible way to remedy the devastation caused by the chafers; in order to respond befittingly to this high-level order [hoher Befehl], the affiliated societies were invited—in consultation with the peasants—to send such advice to the Society." Within less than one month, twelve letters had been received in response, followed shortly thereafter by another eight letters.[55] Some of the letters came from members of the Economic Society who were bailiffs [Landvogt] in the Bernese territory,[56] while others came from civil

der Frühen Neuzeit, vol. 7.1: *Orte der Schweizer Eidgenossenschaft: Bern und Zürich* (Frankfurt/M. 2006), no. 2607, 3038, 3600, 4066 and 4446.

[54] Measuring unit corresponding to 13–14 litres. See URL: http://www.hls-dhs-dss.ch/textes/d/D26187.php.

[55] 'Auszüge einiger Berathschlagungen der oekonomischen Gesellschaft', *AB* (1771), no. 1, I–XXII: VIII–XI.

[56] E. von Graffenried von Burgistein, S. Engel, Stürler von Cottens, N.E. Tscharner, V.B. Tscharner, and G. de Seigneux de Correvon, a magistrate from Lausanne.

servants[57] and rural clergymen[58] who were members of affiliated societies in Aarau, Lausanne, Nyon, Payerne, Simmental, Vevey and Yverdon. The diverse origins of the letters reflect the spatial variation of cockchafer populations. In general, the regular exchange of letters with affiliated societies dispersed throughout the territory of Bern was one of the prerequisites for the spatially differentiated transfer process envisioned by the Economic Society, in terms of both ecological and social connectivity.[59] Bernese territory extended from the Lake of Geneva through the Emmental to the Bernese Oberland and included all agricultural zones of premodern Switzerland.[60]

This is not the place to discuss the diverse contents of these 20 letters about the problem of cockchafers, some of which provided great detail. A few examples will have to suffice. All respondents agreed that the main shortcoming was weak enforcement of the cockchafer ordinance of 1689. Beat Ludwig Mesmer, for instance, a clergyman from Reutigen in the Bernese Oberland, stated: "This much I know, that I read out the cockchafer ordinance from the pulpit at the appropriate time, but have concluded to my dismay that not the slightest effort has been made to enforce it. There is a certain superstition among our peasants, that the more one strives to eradicate these vermin, all the more they will reproduce."[61] Enforcement was also made more difficult by the fact that cockchafers, naturally, did not recognise political borders. A report from the Bernese Aargau stated that "cockchafers fly with the winds, which bring entire swarms into the country."[62] A complaint from Payerne lamented increased trouble with cockchafers due to failure by the neighbouring canton of Freiburg to do anything to control them.[63] And from Nyon came a report that local residents imported large numbers of cockchafers collected not far from the

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[57] J.-D. Bourgeois, L.-E. Bourgeois, D.-J. de Dompierre, L.-F. de La Fléchère, F.-L. Haldimand, J.-G. Pillichody.

[58] F.-X. Duchet, D.-H. Dupraz, J. Ernst, G. Henchoz, B.L. Mesmer, J.-L. Muret; see Wyss 2007 (note 4).

[59] See Martin Stuber, 'Das Korrespondenznetz der Oekonomischen Gesellschaft Bern, 1759–1800', in Ulrich Johannes Schneider (ed.), *Kulturen des Wissens* (Berlin and New York 2008), 123–132.

[60] See André Schluchter, 'Agrarzonen', in *Historisches Lexikon der Schweiz* (Basel 2002), vol. 1, 144–147.

[61] Letter from B.L. Mesmer to the Economic Society, 13 August 1770 [Burgerbibliothek Bern, hereafter BBB]; also: Letter from J. Ernst to the Economic Society, 25 August 1770 (BBB).

[62] Letter from J. Ernst to the Economic Society, 25 August 1770 (BBB).

[63] Letter from D.-J. de Dompierre to the Economic Society, 18 April 1770 (BBB).

border in Savoy, so that they could earn as much additional compensation as possible.[64]

Clergyman Duchet from the affiliated society in Vevey made a suggestion worth noting. He recommended greater use of the natural enemies of the cockchafer such as swine [Acherumsweide], chickens and ducks, as well as crows and ravens. He came to the conclusion that this was perhaps the reason why these birds were more respected in Sweden, England and overseas.[65] Finally, there is the proposal made by Niklaus Emanuel Tscharner. By contrast with the old cockchafer ordinance that prescribed the same quantity of cockchafers to be collected by every person, he proposed to link the obligation to collect the insects to social class as determined by the land area owned.[66] Tscharner's idea, which was also proposed by other magistrates such as Samuel Engel,[67] was fully adopted in the new cockchafer ordinance of 1771.[68] Overall, the greatest changes by comparison with the old ordinance of 1689 can be seen in improved and more specific provisions for enforcement and fines. Thus those charged with oversight were now required to file precise reports on enforcement in spring and in autumn; the collected fines were divided equally between the local magistrate and the overseer; and there was a provision for an extraordinary tax that could be levied in "flight years" [Flugjahre].[69] In material terms, the obligation to collect grubs during ploughing and to collect cockchafers in flight years was the core of the new ordinance, as in the ordinance of 1689.

A look at the flight years of the so-called "Bern brood" reveals a series of intense years—1762, 1765, 1768, and 1771—that ends abruptly.[70] The

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[64] Letter from S. Engel to the Economic Society, 1 August 1770 (BBB).

[65] Letter from F.X. Duchet to the Economic Society, 12 August 1770 (BBB).

[66] Letter from N.E. Tscharner to the Economic Society, 11 August 1770 (BBB); see Karl Wälchli, *Niklaus Emanuel Tscharner. Ein Berner Magistrat und ökonomischer Patriot 1727–1794* (Bern 1964), 131–133.

[67] Letter from S. Engel to the Economic Society, 1 August 1770 (BBB); BBB GA Oek. Ges.52 (4) Remarques sur le Projet, Samuel Engel, Nyon, 22 April 1770.

[68] 'Maikäfermandat' (9.3.1771), in Rennefahrt 1866 (note 53), 822–824.

[69] The life cycle of an individual cockchafer takes three years. This cycle occurs synchronously for a majority of individuals throughout a region, leading to the emergence of larger numbers of cockchafers every three years. These years are called "flight years" [Flugjahre; English-language entomologists usually call them broods, referring to the group of individuals in flight rather than the time of flight]. Flight years vary from region to region; in Bern, they are the years following those divisible by three. See Keller 1986 (note 49), 21–23.

[70] 'Maikäferauftreten nach Flügen im Kanton Zürich, Berner Flug (1762–1980)', in Büchi et al 1986 (note 49), 31.

question of how much the new cockchafer ordinance of 1771 might have contributed to this cannot be answered satisfactorily here, as too many influencing factors were at work, including climate conditions.

When Bern experienced a new series of pronounced flight years around the turn of the century (1798, 1801, 1804, 1807, 1810), many contemporaries attributed it to the practical break-down in enforcement of the cockchafer ordinance owing to political upheaval. In response to this, the Economic Society publicly announced a prize in 1803 for the best response to the question: "What are the most sure and feasible means, based on the natural history and the habits of this beast, of preventing or anticipating the damage that the cockchafer causes as a grub, as well as in its fully developed form."[71] The prize question, developed in cooperation with the Bernese Society of Natural Science[72] in its published form consisted of no less than six printed pages. Respondents were given time to answer until 1809, i.e. a period covering two complete cockchafer cycles. Questions were posed, for example, about the causes of regional differences in flight years or the extent to which the insects "migrated from place to place like locusts." Interest was also expressed in regions that had so far remained free from this "plague", as well as regions that had only recently been affected: "What data are available on their gradual increase and advance in such places?" It was requested that data be based on continual observation in natural settings; in doing so, this research was explicitly meant to go beyond a significant publication in the *Bemerkungen der Pfälzischen physikalisch-oekonomischen Gesellschaft* by Christian Kleemann, whose work was based on observations of artificial incubators.[73]

Given the scope of this prize question, answers to which would have required actual research projects, it is not surprising that no satisfactory responses were submitted. The question was ahead of its time in terms of its relation to specialised entomological research.[74] Only four decades later

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[71] 'Preis-Aufgab, die Vertilgung oder Verminderung der Maykäfer und ihrer Larven der Engerlinge betreffend', *Monatliche schweizerische Nachrichten* (1803), 48–53; see Peter Lehmann, *Bescheidene Lebenszeichen im Schatten einer glorreichen Vergangenheit? Die Oekonomische Gesellschaft im Übergang von der Reformsozietät zum Landwirtschaftsverein 1798–1831*, master's thesis in history, University of Bern, 2008, 41.

[72] With S.E. Studer and F.A. Meisner.

[73] Christian Friedrich Karl Kleemann, 'Von den Maykäfern', *Bemerkungen der Kuhrpfälzischen physikalisch-oekonomischen Gesellschaft vom Jahr 1770* (1771), second part, 299–409.

[74] See, for example, Charles Huber, *Die Ringe des Apollo. 150 Jahre Entomologischer Verein Bern 1858–2008* (Bern 2008); Fritz Schwerdtfeger, *Julius Theodor Christian Ratzeburg 1801–1871* (Hamburg and Berlin 1983).

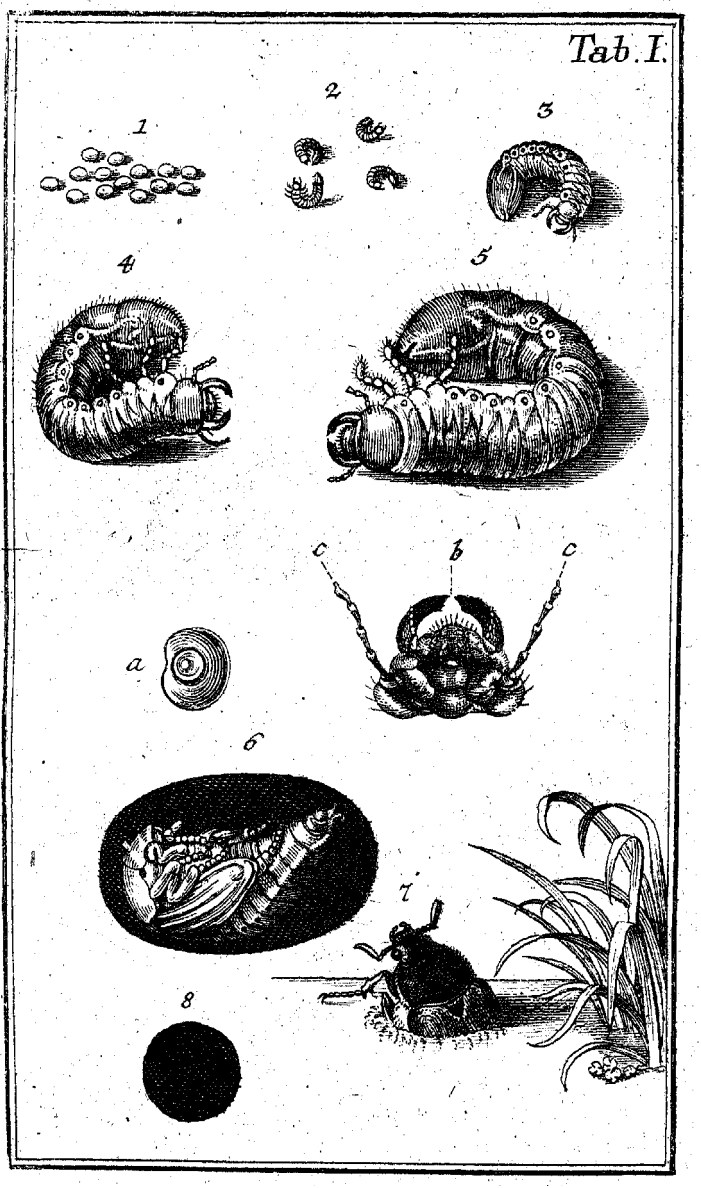

Fig. 1. Life cycle of the cockchafer, in Christian Friedrich Karl Kleemann, 'Von den Maykäfern', in: *Bemerkungen der Kuhrpfälzischen physikalisch-oekonomischen Gesellschaft vom Jahr 1770* (1771, 2. Teil), 299–409, Tab. I.

was it possible to identify the different Swiss flight years of the cockchafer with precision.[75] And it was only more than a century later that a spatially accurate map of the different Swiss flight years was produced, based on systematic field research.[76] Individual responses to the question were received from people with practical experience, however, and published in the *Gemeinnützige schweizerische Nachrichten*. This was not the same thing as natural history research, however. The point was not to explore "the secrets of the cockchafer's marital bed and child bed" but how to prevent "future concrete damage".[77] Hence recommendations were made for stricter and more efficient enforcement of the official ordinance, as well as for conservation of birds as the natural enemies of the cockchafer—a demand that had already been made in the ordinance of 1689.

Combating the Grain Worm

In the mid-eighteenth century a new technology to control storage pests was increasingly coming into use: the grain dryer.[78] The Neapolitan mathematics professor and agronomist Bartolomeo Intieri had developed this device and documented over two decades of experience with it in 1754.[79] His invention was imitated in various towns in France by, among others, scholar and economist Duhamel du Monceau and the Jesuit Esprit Pezenas, a mathematics professor and instructor of ship-building in Marseille.[80] With knowledge of experience that had been gained in Marseilles, Geneva councilman Du Pan conducted experiments with Intieri's grain

[75] Otto Heer, 'Über geographische Verbreitung und periodisches Auftreten der Maikäfer', *Landwirthschaftliche Abhandlungen* (1841), 3–33.

[76] 'Aires actuelles des différents régimes', in Maurice Decoppet, *Le hanneton. Biologie, apparition, destruction. Un siècle de lutte organisée dans le canton de Zurich. Experiences récentes* (Lausanne and Genève 1920), cartes 17.

[77] [N.N.], *Gemeinnützige schweizerische Nachrichten* (30.4.1803), 271.

[78] The following is based on the entry for 'Korndarre' in Johann Georg Krünitz, *Ökonomisch-technologische Enzyklopädie* 45 (1789), 1–155; K.B. Maréchaux, 'Würdigung sämmtlicher bis jetzt bekannt gewordener Methoden, das Getreide, mehrere Jahre hindurch, ohne Nachttheil für dassselbe, aufzubewahren', *Polytechnisches Journal 5* (1821), 223–253.

[79] Bartolomeo Intieri [Fernando Galiani], *Della perfetta conservazione del grano* (Napoli 1754).

[80] Henri-Louis Duhamel du Monceau, *Traité de la conservation des grains, et en particulier du froment* (Paris 1753); id., *Supplément au Traité de la conservation des grains; contenant plusieurs nouvelles expériences; une méthode plus simple de conserver les grains que celle qui a été publiée en 1754* (Paris 1765); [Esprit Pezenas], 'Méthode pour mettre le bled en état de se conserver', in *Mémoires de Mathématique & de Physique rédigés à l'Observatoire de Marseille* (Marseille 1756).

dryer, developed the invention further, and documented his experience in detail. In 1756 first the hospital and then the Grain Chamber [Kornkammer] introduced the grain dryer in Geneva. The new technology spread from Geneva to Bern and Zurich. The grain dryer employed a principle of physics: the larger the surface area of a body, the quicker moisture evaporates from it. Threshed grain was spread in the grain dryer over as wide a surface area as possible, in receptacles arranged vertically in layers. The dryer was heated by a coal fire. Thanks to the enlarged surface area, grain dried much more rapidly this way than in conventional grain piles.[81] Bernese authorities were interested in the new invention, as a sufficient food supply for their subjects was of central concern in the paternalistic concept of the state under the Ancien Régime in the Republic of Bern.[82] Official granaries in the capital city and in the districts were meant to ensure minimal basic supplies of food during times of shortage. In years when harvests were good, the authorities built up stores of grain which they released onto the market during shortages in order to stabilise grain prices. By using paternalistic techniques of this sort as a ruling strategy, the Republic of Bern was acting in a fashion similar to that of enlightened monarchies such as Prussia.[83] After an extraordinarily poor harvest in 1757, the Great Council of Bern seized the initiative and undertook expansion and new construction of official grain storehouses.[84] This made the question of optimal grain storage a timely one.

From the time grain first began to be stored in large amounts there had been problems of losses owing to mould, fermentation and pests. The question of how grain could be stored without major losses occupied numerous economic societies from Sweden to Turin, Paris and

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[81] Krünitz 1789 (note 78), 56–68.

[82] Christian Pfister, 'Deregulierung. Vom Paternalismus zur Marktwirtschaft 1798–1856', *Berner Zeitschrift für Geschichte* 60 (1998), 160–173: 162; Anton Brandenberger, *Ausbruch aus der "malthusianischen Falle". Versorgungslage und Wirtschaftsentwicklung im Staate Bern 1755–1797* (Bern 2004), 323f.

[83] Pfister 1998 (note 82), 165; on the granary system in Prussia, see Lars Atorf, *Der König und das Korn. Die Getreidehandelspolitik als Fundament des brandenburg-preussischen Aufstiegs zur europäischen Grossmacht* (Berlin 1999), 120–133.

[84] Various documents in the records of the Grain Chamber provide evidence of these activities. State Archives of the Canton of Bern [hereafter StAB] BVI 44, *Berichte und Denkschriften über die Getreideversorgung des Landes*, 1725–1795; see Dieter Schnell, 'Obrigkeitliche Kornhäuser', in Holenstein et al. 2008 (note 11), 468–471: 470; Martin Körner, 'Kornhäuser in der städtischen Versorgungspolitik', in Thomas Lörtscher (ed.), *"währschaft, nuzlich und schön". Bernische Architekturzeichnungen des 18. Jahrhunderts* (Bern 1994), 25–30.

St. Petersburg.[85] The Economic Society of Bern also took up the question of the "best means of storing grain" in its comprehensive work plan. Specifically, the Society wanted to find out how storehouses needed to be constructed in order to store grain securely in the minimal amount of space, and how grain could best be protected against storage pests.[86] In addition to making grain storable by drying it in a grain dryer—which will be central focus of discussion below—the Economic Society also issued publications in the 1760s on other methods of controlling storage pests. For instance, rapid drying immediately after harvest without using a grain dryer was proposed, after which the grain was to be filled into in sacks treated with lye and stored at a level above the ground.[87] Another publication advocated treating the grain with salt.[88] Samuel Engel, who twice held the office of bailiff [Landvogt], 1748–1754 and 1760–1765, and was a member of the Grain Chamber from 1756 to 1760, had already concerned himself with the storage of grain prior to the founding of the Economic Society in 1759.[89] Engel had scarcely begun to serve his first term as bailiff when he made a request for the construction of a new grain storehouse at his official residence, which was immediately approved. He took great care when it came to maintaining grain supplies, making sure that the public grain supply was cleansed annually, which was not a common practice. As a member of the Grain Chamber, Engel put the issue of installing a grain dryer on the agenda of the state administration. He may have been motivated in this regard by his friend Albrecht von Haller. This Bernese universal scholar had acquired Intieri's description of the grain dryer from a Paduan correspondence partner already in October of 1755,[90] and all of the above-mentioned publications by Duhamel du Monceau on pest control by means of the grain dryer could be found in Haller's library, as well.[91]

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[85] J.D. Reuss, *Repertorium Commentationum a societatibus litterariis editarum, scientia naturalis*, vol. VI: *oeconomia* (Göttingen 1806), 196–202.

[86] Entwurf 1762 (note 6), 30f.

[87] Isaac Marcet de Mezieres, 'Auszug einer Abhandlung von der einfältigsten und gewissesten weise das Getreid aufzubehalten', *AB* (1763), no. 3, 181–188.

[88] François Joseph Antoine de Hell, 'Anzeige eines Mittels zu Bewahrung des Getreides', *AB* (1768), no. 2, 127–137.

[89] Paul Pulver, *Samuel Engel. Ein Berner Patrizier aus dem Zeitalter der Aufklärung 1702–1784* (Bern and Leipzig 1937), 59.

[90] Letter from von Haller to Giambattista Morgagni, 10 October 1755, in Erich Hintzsche (ed.), *Albrecht von Haller, Giambattista Morgagni. Briefwechsel 1745–1768* (Bern and Stuttgart 1946), 65.

[91] Maria Teresa Monti (ed.), *Catalogo del Fondo Haller della Biblioteca Nazionale Braidense di Milano* (Milano 1983–1994), 13 vols., no. 2305, 2299 and 2304.

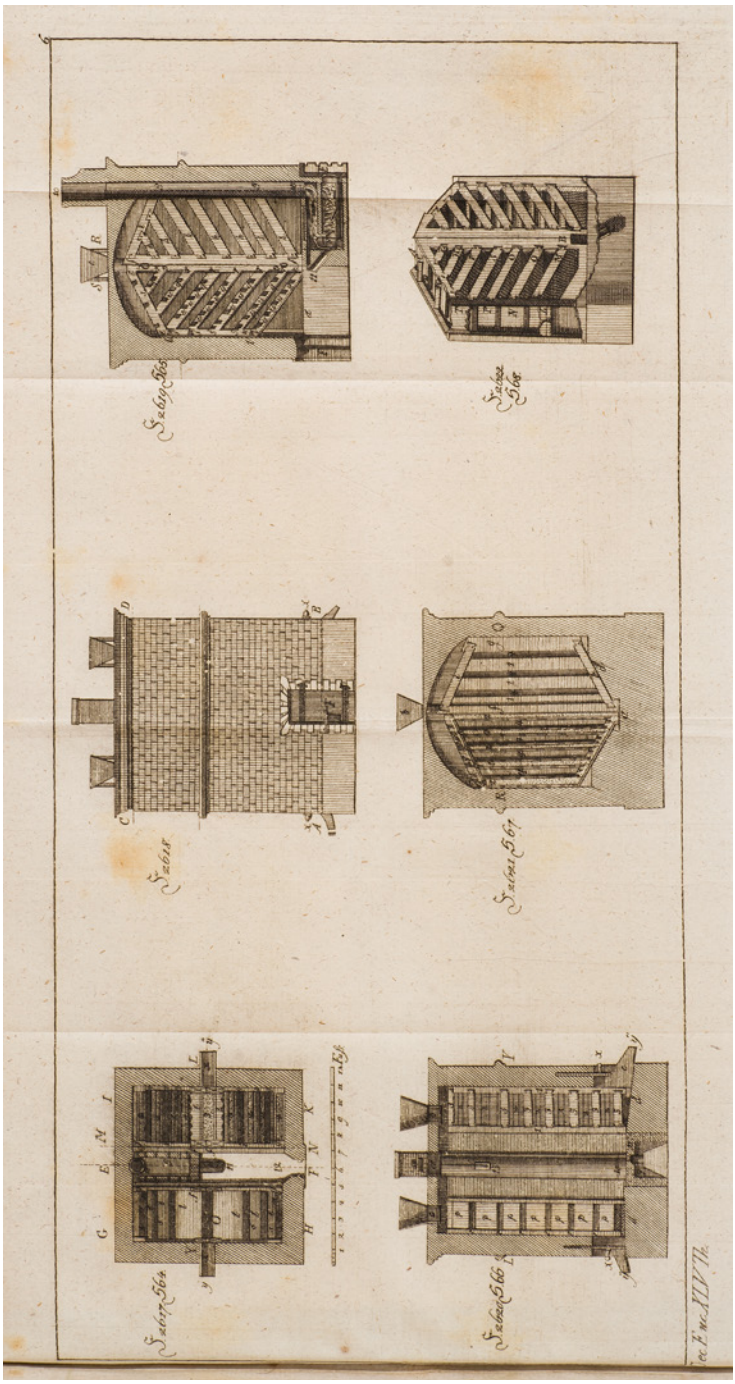

Fig. 2. Grain dryer developed by Henri-Louis Duhamel du Monceau, in Johann Georg Krünitz, *Ökonomisch-technologische Enzyklopädie*, Vol. 45 (1789), 1–155, Fig 2617–2621.

In this initial phase, the state project of introducing a grain dryer was clearly directed by Samuel Engel.[92] He wrote a treatise entitled "On a new method for long-term storage of grain without vitiation and wastage", which was printed by the state printing office and distributed to all members of the Great Council so that they could familiarise themselves with the topic.[93] A review of the issue, which the Council sought from the Venner Chamber and the Grain Chamber, resulted in a recommendation that the state introduce the method described by Engel.[94] The Great Council followed Engel's expert advice, deciding to install a drying oven in the big grain storehouse. In 1760 Engel's treatise on grain storage also appeared in the publication organ of the Economic Society.[95]

The Society's archives contain comprehensive documentation on the grain dryer, including a manuscript of 1757[96] by Esprit Pezenas of Marseilles—already mentioned here—as well as transcripts of letters from other persons in various cities who were also concerned with introducing the grain dryer and who were in contact with the Geneva councilman Du Pan.[97] The administrative documents of the Grain Chamber include a transcript of Du Pan's treatise on the grain dryer, with an accompanying letter of 1759. It can be assumed that these documents, concerning the same object and contained in two different archives, were available to Samuel Engel as sources for his own publication. Engel based his work heavily on Du Pan's experience and remarked that he could also envision possible publication of Du Pan's and Pezenas's writings in the publication organ of the Economic Society.[98] Engel's treatise also related closely to two papers dealing with long-term storage of grain that were published in the same volume by the Society of Natural Science in Zurich

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[92] StAB BVI 24, *Manual der Korndirektion der Stadt Bern*, 10 August 1757–23 May 1759, 397f.

[93] Samuel Engel, *Abhandlung über eine neue Weise, das Getreyd lange Jahr ohne Verderbniss und Abgang zu erhalten* (Bern 1759).

[94] StAB BVI 44, *Berichte und Denkschriften über die Getreideversorgung des Landes*, 1725–1795.

[95] Samuel Engel, 'Abhandlung über eine neue Weise, das Getreid lange Jahr ohne Verderbnis und Abgang zu erhalten', *SG* (1760), no. 4, 785–816.

[96] Manière de mettre le Bled en état de se conserver en voyé à la cour de France par le R.P.: Pezenas, Professeur en Mathematique à Marseille, date du 30e avril 1757, page 1–9, BBB GA Oek. Ges. 67 (11) Memoires et lettres sur l'utilité d'une etuve, et la manière de les construire et dessécher le bled. s.d.

[97] BBB GA Oek. Ges 67 (11) Memoires et lettres sur l'utilité d'une etuve, et la manière de les construire et dessécher le bled. s.d.

[98] No later editions of either paper have been found. Engel 1760 (note 95).

[Naturforschende Gesellschaft] in 1761.[99] The first paper, of which Engel had a transcript,[100] summarised what the author, Heinrich Schinz, had presented in a talk given at the Society of Natural Science in 1760. The second, written by Engel's friend Johannes Gessner, gave a detailed explanation of the causes of grain losses and discussed possible measures for reducing them. In his comprehensive scientific paper, Gessner described insects and their life cycles and gave his reasons for doing so:

> For it will be much easier to identify means of combating them, and thereby show how the damage to be dealt with can be prevented and how already noticeable vitiation can be halted, if we can first learn about their constitution and nature, their industriousness, their behaviour, their habits, when they appear, the places they invade, and the parts they destroy.[101]

After an introduction heavily laced with physico-theological ideas,[102] Gessner expanded on the problems of grain loss and their causes. In his view, the greatest threats to grain supplies were the grain moth and the grain weevil. While other pests such as mice, martens and rats devoured a portion of the grain reserves and also contaminated them with their feces,[103] the insects used the mealy core of the grain as nourishment or even as a nesting place for their eggs.[104] Adult grain moths laid their eggs in the grain piles, where newly hatched worms subsequently bored into individual kernels to consume the mealy core. In autumn they crawled into the woodwork of the granary, pupated, and emerged as moths the following spring. Among the grain worms were some species that subsisted entirely on wheat berries and some that caused damage only to spelt. Grain weevils had no wings but they did have an elongated snout, and they fed on grain in the form of worms as well as adult weevils.[105] His investigations brought Gessner to the conclusion that the factors that caused grain to germinate—a certain amount of moisture and warmth—were the same

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[99] Heinrich Schinz, 'Abhandlung von einer neuen Weise, das Getreyd lange Jahre ohne Verderbnis und Abgang zu erhalten', in *Abhandlungen der Naturforschenden Gesellschaft Zürich* (Zürich 1761), vol. 1, 133–188: 149f.; Johannes Gessner, 'Abhandlung über die verschiedenen Arten das Getreyd zu bewahren, und derselben Auswahl', ibid., 231–320: 268; see also Engel 1760 (note 95), 813.

[100] BBB GA Oek. Ges. 67 (10) Abhandlung von einer neuen viel vorteilhafteren Methode das Korn zur Aufbewahrung in den Magazinen fähig zu machen, verfasst von der Physikalischen Gesellschaft Zürich 1759.

[101] Gessner 1761 (note 99), 255f.

[102] Ibid., 240f.

[103] Ibid., 268.

[104] Schinz 1761 (note 99), 145f.

[105] Gessner 1761 (note 99), 256–265.

factors that caused vitiation of grain and fostered the reproduction of insects.[106] Engel also described these causes in his paper. But unlike Gessner, he refrained from comprehensive discussion of basic principles of natural history. In his view, the key issue was practical problem-solving, and his arguments followed the logic of politics and economics. Physico-theological considerations, however, were a feature common to the work of both Gessner and Engel. Thus, according to Engel, "One thing remains wondrous: Providence has seen fit to care for every creature, even every insect, no less than for mankind . . . even the tiny worm finds its appropriate tender food and nourishment . . ."[107]

Schinz and Engel as well as Gessner reported on previously applied methods of preventing pests from invading stored grain. Grain was covered with lime to protect it from invasion by animals; but if fissures developed in the lime, this measure was of minimal benefit. Different publications described a great variety of means—from sulphur vapour to boiled garlic—for treating stored grain.[108] Grain was disbursed in shallow piles in the granary so it would dry more rapidly. Regular turning over with a shovel was done to prevent too much moisture. But these measures were very costly and labour-intensive and required a great number of granaries. All three authors expected the most benefit from the new technological development represented by the grain dryer. A drying oven could dry grain within twelve hours, whereas this had previously taken a full 20 years.[109] The normal procedure was to store the grain in low piles on the granary floor after threshing and to aerate it regularly. This method required about 20 years for grain to dry thoroughly enough to prevent it from attack by grain weevils.

After deciding to construct a grain dryer, the Bernese authorities in 1759 commissioned a second member of the Economic Society, Franz Ludwig von Graffenried (von Carrouge)[110] to supervise its installation.[111] In January 1759 granary administrator Niklaus Emanuel Haller, brother of Albrecht von Haller, already received from Geneva a model of the grain dryer oven; in winter of 1760 a dryer was constructed in Bern based on this model,

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106 Ibid., 246–252.

107 Engel 1760 (note 95), 788–789.

108 Gessner 1761 (note 99), 298–301.

109 Schinz 1761 (note 99), 167.

110 F.L. von Graffenried, who was part of the circle of the Economic Society from the beginning, was elected to the Great Council in 1745, became a member of the Grain Council in 1761, and assumed the office of bailiff [Landvogt] in Wangen in 1762.

111 Schinz 1761 (note 99), 174.

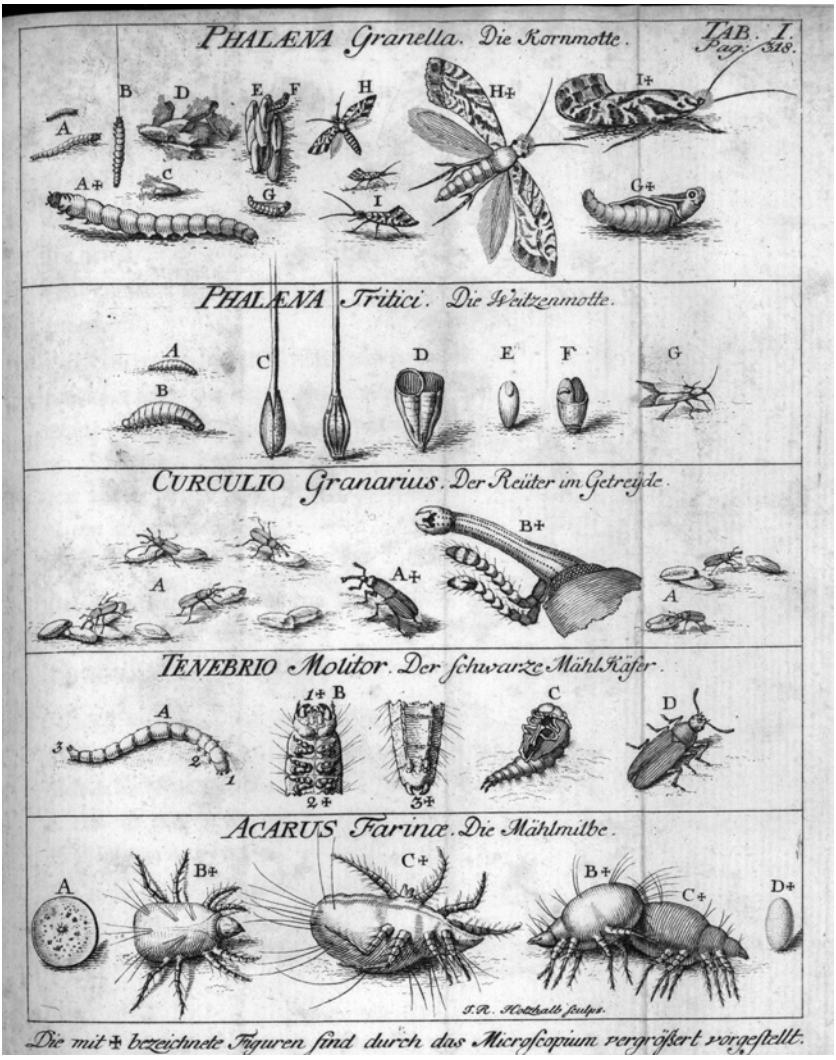

Fig. 3. Grain pests, in Johannes Gessner, 'Abhandlung über die verschiedenen Arten das Getreyd zu bewahren, und derselben Auswahl', in: *Abhandlungen der Naturforschenden Gesellschaft Zürich* (1761), 231–320.

and was tested with small amounts of grain in the following summer. In May and June of the next year, Graffenried conducted additional experiments with larger amounts of grain.[112] He compiled the results of his experiments with the grain dryer, describing benefits as well as amounts of grain lost for his various samples, in a report that appeared in the publication series of the Economic Society in 1762.[113] According to Graffenried's data, losses with dried grain were far less than those normally experienced with undried grain.[114] Moreover, he presented a comparison showing that greater amounts of dough and bread could be produced from dried grain than from undried grain.[115]

Graffenried had already participated in a meeting of the Grain Chamber in September of 1760, although he was not yet a member of the Chamber at that time. In the same month he was given a mandate to inspect the granaries in Moudon and Payerne.[116] In March of 1761, Graffenried was granted broad leeway for trials with the grain dryer, with as much space and grain allocated as he needed to carry out these tests.[117] While this experimental phase was still underway in 1763, the bailiff of Nyon, who was active in the local affiliate of the Economic Society, expressed a wish to obtain a grain dryer for his granary. The Grain Chamber denied the bailiff's request, citing the following reasons: 1) the grain dryer in Bern was only an experimental operation and not an "infallible rule"; 2) construction of a grain dryer required specialists who were unlikely to be found in Nyon; 3) the people of the Vaud region were not striving for the common good but were acting only in their own interests, and a dryer was too expensive in any event. Moreover, not every bailiff was familiar with the use of a grain dryer. For these reasons, the bailiff was advised to continue to sieve and carefully aerate his grain in future.[118] Although the Grain Chamber had decided in favour of constructing a grain dryer as

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[112] 'Mémoire de Mr. Mathey', 1767, StAB BVI 44, *Berichte und Denkschriften über die Getreideversorgung des Landes*, 1725–1795.

[113] Franz Ludwig von Graffenried, 'Nachricht von der auf hohen Befehl zu Bern mit der Korndarre angestellten Probe', *AB* (1762), no. 4, 183–186.

[114] Engel mentioned a loss of 20–25 per cent in 20 years. After drying, Graffenried spoke of a one-time loss of 3.5 per cent. Engel 1760 (note 95), 813; Graffenried 1762 (note 113), 183–186.

[115] The Grain Chamber reported the same success in 1765, also in response to the question from the Great Council about the effectiveness of drying grain. StAB BVI 27, *Manual der Korndirektion der Stadt Bern*, 28 October 1763–28 May 1766, 345–350.

[116] StAB BVI 25, 26 May 1759–27 June 1761, 178 and 189–196.

[117] Ibid., 404, 429, 462 and 490f.

[118] StAB BVI 26, June 1761–5 October 1763, 403–406.

proposed by Engel, it was wary of granting permits for construction of an additional dryer. Moreover, in its justification the Chamber shows deep mistrust about the competence and honesty of the people of Vaud.

Overall, however, the Bernese authorities remained committed to the new technology of grain preservation. In 1767 Graffenried von Carrouge was asked by the Grain Chamber to make plans for a grain dryer in Aarau as well.[119] Graffenried became a technical expert in all aspects of grain drying, drawing up plans[120] and securing a carpenter to do the job who had already familiarised himself with the construction of such grain dryers. The Grain Chamber interceded with the Guilds Commission [Handwerksdirektorium] to ensure that the carpenter would be able to hire as many journeymen as he needed for work on the dryers.[121] In 1769 the Council informed the Grain Chamber about new decisions concerning the construction of granaries and grain dryers. A large grain storehouse with a capacity of ten to twelve thousand sacks and including a grain dryer was to be built at a site in Vaud still to be determined. In the German-speaking region, a drying oven was planned for the existing grain storehouse in Thun, and an additional storehouse with a drying oven was to be built in Burgdorf.[122] Concurrent with his responsibility for directing projects and his engineering duties relating to grain dryers, Graffenried exchanged letters with other experts. Between 1759 and 1761 he corresponded with Johann Jakob Ott, the long-time president of the economic commission of the Society of Natural Science in Zurich, who was also engaged in the construction of a grain dryer.[123] The archives of the Grain Chamber also contain an exchange of letters between Graffenried and the engineer of the King of Sardinia in which both experts discuss technical details and possibilities for optimisation.[124] Knowledge transfer took place through various channels. In addition to Graffenried's correspondence, there were other exchanges of experience involving various members of the Economic Society of Bern and representatives of Society of Natural Science

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[119] StAB BVI 28, 4 Juni 1766–2 March 1768, 299.

[120] StAB BVI 29, 9 March 1768–17 January 1770, 78.

[121] StAB BVI 28, 4 Juni 1766–2 March 1768, 299–303.

[122] StAB BVI 29, *Manual der Korndirektion der Stadt Bern*, 9 March 1769–17 January 1770, 144–146.

[123] *AB* (1762), no. 1, LV.

[124] 'Mémoire de Mr. Mathey', 1767, StAB BVI 44, *Berichte und Denkschriften über die Getreideversorgung des Landes*, 1725–1795. The engineer of the King of Sardinia originally came from Vallorbe and was on the list of honorary members of the Economic Society of Bern from 1761.

in Zurich, who then made their knowledge available to the state administration of Zurich.[125] But exchange also took place at the level of the administrative commissions. In 1759 the Grain Chamber in Bern sent Du Pans's paper, together with a wooden model of his grain dryer, to Zurich.[126] Basle also contacted the Grain Chamber in Bern asking for a report of its experience, in response to which the Chamber in 1770 sent transcripts of Graffenried's reports on his experiments of 1762 with the grain dryer and of his report to the Great Council in 1765, and also dispatched a sample of dried grain to Basle by way of a merchant. On the basis of experience in Bern, Solothurn decided to obtain a grain dryer as well, and the secretary of the affiliate in Solothurn procured a sample of dried grain from the Economic Society in Bern for the Grain Chamber in Solothurn.[127]

Further evidence of the reputation of the Bernese grain dryer can be found in reports by two noted travel writers. Johann Gerhard Reinhard Andreae devoted several lines to the grain dryer in letters from Switzerland written in 1763 and published subsequently, providing among other things a very graphic description of the success of this technology in controlling pests:

> Here, sir, I have seen several piles of grain lying about that had not been dried. And what destruction they had suffered from worms! Half a bucketful of worms was flushed out of them during washing. What a horrible sight! By contrast . . . dried grain, when completely sheltered from the open air, is entirely protected from being plagued by worms, but if, as happens here, the air can penetrate to some extent, only the upper part of the grain is affected by worms, and only a very thin layer and by few worms.[128]

And Count Karl von Zinzendorf, who visited Switzerland to study its trade policy in 1764, carefully recorded how the grain dryer in Bern was constructed and described its function in detail in his report. As no copperplate engraving existed of the Bernese grain dryer, he recommended ordering a model of the device.[129]

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[125] *AB* (1764), no. 1, XV, XX and XXIV; Schinz 1761 (note 99), 174–188.

[126] StAB BVI 44, *Berichte und Denkschriften über die Getreideversorgung des Landes*, 1725–1795.

[127] Letter from F.J. Hermann to the Economic Society, 9 September 1767 (BBB).

[128] Johann Gerhard Reinhard Andreae, *Briefe aus der Schweiz nach Hannover geschrieben, in dem Jahre 1763* (second edn., Zürich and Winterthur 1776), 204–211: 204.

[129] Otto Erich Deutsch (ed.), 'Bericht des Grafen Karl von Zinzendorf über seine handelspolitische Studienreise durch die Schweiz 1764', *Basler Zeitschrift für Geschichte und Altertumskunde* 35 (1936), 151–354: 301f.

Conclusion: Administrative Knowledge and Technology

Towards the end of the seventeenth century the Bernese state increasingly expanded its interventions in the political economy to cover its entire territory.[130] The Economic Society put efforts in this area on a new basis by systematically recording the resources of the territory of Bern and making consistent distinctions between "useful" and "harmful". In an effort to counterbalance the "idleness" and "prejudice" of the rural people, the Economic Society of Bern aimed to make pests a field of endeavour, administration, and knowledge. Like their colleagues in Stockholm, Göttingen and Zurich, the members of the Economic Society of Bern postulated natural history as the scientific foundation for their agro-economic reform project. This was indeed the case with cultivated plants. First of all, scientific nomenclature was the prerequisite for large-scale international exchange of the seeds of new cultivated plants as well as for exchange of experience with such plants. Secondly, a proper inventory of current and potential plant resources in the territory of Bern could only be made using scientific taxonomy. With regard to pest control practices, however, science was of no immediate fundamental significance, even though it was maintained from Sweden to Zurich and Bern that this was the case. Concrete measures to control the cockchafer still had the same basis in natural history in 1800 that they had had a century earlier; no advance had been made beyond knowledge of the three-year cycle of the cockchafer, which had already formed the foundation of the first Bernese ordinance at the end of the seventeenth century. Nor was the grain dryer based on a natural history of storage pests; rather, it was the result of technology transfer rooted in physical knowledge. The fact that the Economic Society nonetheless highlighted the fundamental quality of natural history had to do, among other things, with attempts to justify science.

It was not scientific knowledge but two other types of knowledge that were at the centre of the efforts to control pests covered in this study. On one hand, the Economic Society generated administrative knowledge, which it was predisposed to do; many of its members were engaged simultaneously as experts, administrators and members of the government. With respect to the cockchafer, surveys conducted by letter elicited differentiated knowledge about local enforcement of official ordinances and suggestions for optimising them. The overall goal of local connectivity

[130] See, for example, Regula Wyss and Nelly Ritter, 'Kammern und Kommissionen', in André Holenstein et al. 2008 (note 11), 32–36.

pursued by the economic and patriotic societies coincided here with the intentions of the administration, which increasingly viewed knowledge about "locality"—understood as the total of all social, economic and cultural factors at work at the local level—as a central basis for its policing measures.[131] Significantly, on the other hand, the attempt to promote natural history research on the cockchafer by means of a prize question was a failure. The systematic and continual work of observation in a natural setting that this would have required was beyond the capacity of lay researchers; it pointed towards specialised, professionalised entomology that was to become institutionalised only in the nineteenth century.

In the case of the grain dryer, in addition to the administrative knowledge which experts in the Economic Society prepared for political decision-makers and the administration, technology must be counted as a further form of knowledge. The introduction of the grain dryer should be seen as a form of technology transfer and can be explained by the categories established in cultural transfer research [Kulturtransferforschung].[132] Characteristic of the Economic Society in this regard was the fact that Bern first figured as a target culture, but only a short time later became a source culture. The prerequisite for this was Bern's comprehensive communication network, which not only extended into the Republic of Letters but was also interwoven with administrative units.

Although virtually no immediate impact of natural science research on the practices of pest control has been identified here, this conclusion does not apply from a longer-term perspective. Utilitarian access to nature, with the dichotomous distinction between "useful" and "harmful" that was developed by application-oriented natural history, was to dominate well into the twentieth century. At the same time, it was precisely the orientation of science towards practice that revealed the limits of knowledge based on natural history and led to the restructuring of established disciplines and the genesis of new ones.[133] Finally, approaches that transcended an instrumental concept of nature are recognisable in the

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[131] André Holenstein, *"Gute Policey" und lokale Gesellschaft im Staat des Ancien Régime. Das Fallbeispiel der Markgrafschaft Baden(-Durlach)* (Tübingen 2003), 2 vols.; id., '"Local-Untersuchung" und "Augenschein". Reflexionen auf die Lokalität im Verwaltungsdenken und -handeln des Ancien Régime', *Werkstatt Geschichte* 16 (1997), 19–31.

[132] See Hansjürgen Lüsebrink, *Interkulturelle Kommunikation. Interaktion, Fremdwahrnehmung, Kulturtransfer* (second edn., Stuttgart and Weimar 2008), 129–179.

[133] On this topic, see Günter Bayerl, 'Prolegomenon der "Grossen Industrie". Der technisch-ökonomische Blick auf die Natur im 18. Jahrhundert', in Werner Abelshauser (ed.), *Umweltgeschichte. Umweltverträgliches Wirtschaften in historischer Perspektive* (Göttingen 1994), 29–56: 53.

discourse about pest control based on natural history. In precise observation of individual insect species, it is possible to detect an interest in the diversity of creation that was not directly related to a specific purpose: every organism, whether useful or harmful, had a value of its own. Just how closely knowledge of nature and its interconnections was at the same time linked with utilitarian access, however, is evident in the above-mentioned prize question about the cockchafer (1803), which sought information about the natural enemies of cockchafer grubs and cockchafers and expressed interest in how this knowledge could be "put to greater use" in order to help "lessen" the scourge of the cockchafer.[134]

[134] Preis-Aufgab 1803 (note 71), 12.

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