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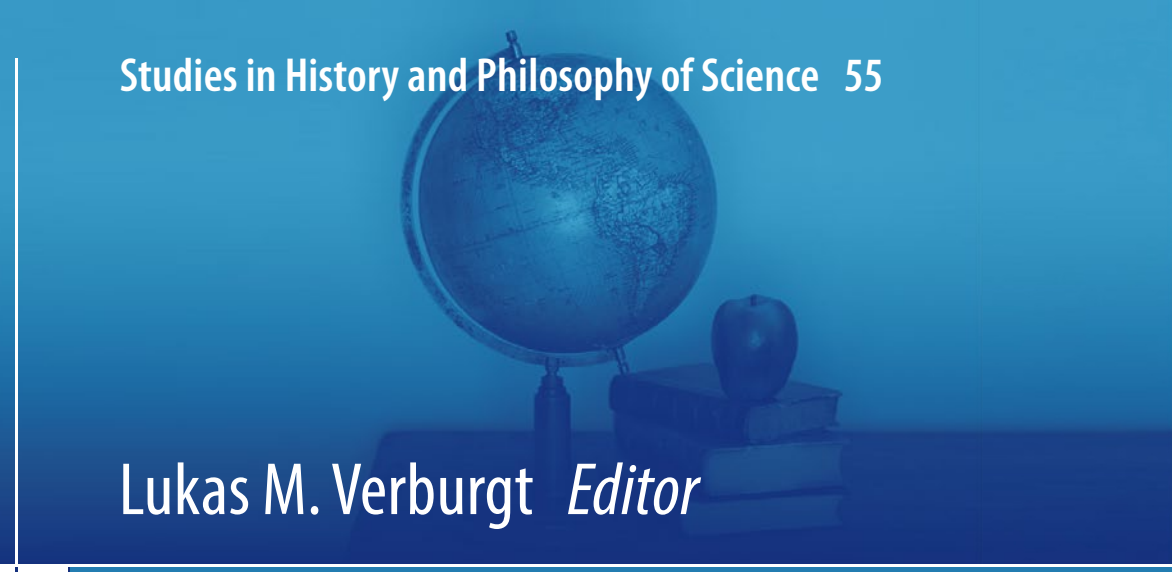

Lukas M. Verburgt *Editor*

A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859

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Studies in History and Philosophy of Science

Volume 55

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ISSN 0929-6425 ISSN 2215-1958 (electronic)
Debating Higher Education: Philosophical Perspectives
ISBN 978-3-030-85257-3 ISBN 978-3-030-85258-0 (eBook)
https://doi.org/10.1007/978-3-030-85258-0

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Acknowledgments and Permissions

This book bears my name on its cover, but it is really the result of a collaboration; as such, it forms a collective body of knowledge. It would have been impossible without the help, support and guidance of Christopher Stray, who has made the process of editing, transcribing annotating and proofreading a pleasure and who has done more work than I would ever have dared to ask for. My gratitude goes to him as well as to all the authors – to June Barrow-Green and Tony Crilly, for their help with mathematical technicalities in letters and diaries and with compiling the appendices, to John Gibbins, for his deep-felt dedication, to Joan Richards, for sharing her transcriptions and scans of the Ellis-Forbes correspondence, to Jonathan Smith, for allowing me to draw on his vast archival knowledge, and to Stephen Stigler, for his willingness to return to Ellis; to Nicolas Bell and Boyd Hilton, for their support of this project; to Arthur Gibson and David Palfrey, for their contribution to the 2018 conference from which this book resulted; and to the staff of the Wren Library, Trinity College, Cambridge. I would also like to thank the series editor, Catherine Abou-Nemeh, for her support, and the two anonymous reviewers for their valuable comments.

For allowing the reproduction of the diaries and letters, I would like to thank the Master and Fellows of Trinity College, Cambridge; Cambridge University Library and St Andrews University Library (Special Collections). For allowing the reproduction of images thanks are due to the Master and Fellows of Trinity College, Cambridge and to the Royal Astronomical Society.

Introduction

Most of the chapters in this volume originated at a conference held at Trinity College, Cambridge, in September 2018. The conference brought together a number of leading scholars who shared an interest in the largely forgotten but fascinating figure of Robert Leslie Ellis (1817–1859). Some had arrived at Ellis from their work in the history of statistics and probability theory or Bacon scholarship. Others knew of him as the Senior Wrangler in the Tripos examination at Cambridge of 1840, as the brother-in-law of William Whewell, the famous Master of Trinity, or as the prodigious early-Victorian polymath who died at the tragically young age of 41. The conference aimed at mapping for the first time (the connections between) Ellis's life, work and times and, especially, at exploring the different aspects of his polymathy, ranging from its origins at Bath, his home town, and its development at Trinity, where he was a Fellow between 1840 and 1849, to its influence and legacy, inside and outside the walls of Cambridge.

'History', it has been said, 'is unkind to polymaths'.[1] Some are simply forgotten, while many others are squashed into categories we can still recognize today. Ellis is principally remembered as a mathematician and Bacon scholar, contributing to the *Cambridge* (*and Dublin*) *Mathematical Journal* and co-editing the classic Victorian edition of the Francis Bacon's works (1857–59), together with James Spedding and Douglas Denon Heath. As far as Ellis was concerned, he cared but little about disciplinary boundaries, in so far as these existed at all at the time.[2] What interested him were the abstract principles of knowledge and reality – or what his colleague James David Forbes, Professor of Natural Philosophy at the University of Edinburgh, called the 'debateable ground which lies on the frontiers of Mathematics and

[1] Alexander Murray, ed. *Sir William Jones, 1746–1794* (Oxford: Oxford University Press, 1998), v. For a recent historical study of polymathy see Peter Burke. *The Polymath: A Cultural History from Leonardo da Vinci to Susan Sontag* (New Haven & London: Yale University Press, 2020).

[2] For a recent discussion of the origin of disciplines in Victorian Britain see Bernard Lightman and Bennett Zon, eds., *Victorian Culture and the Origin of Disciplines* (New York & Abingdon: Routledge, 2020).

Metaphysics, of Natural and Mental Philosophy'.[3] Ellis worked on algebraic, functional and differential equations with as much zeal and pleasure as he read Bacon's *Novum Organum*, studied Roman Law and dictated notes on the formation of bees' cells and a projected Chinese dictionary. Among his peers and contemporaries Ellis was, indeed, known and praised not for one specific work or for one ground-breaking contribution to or achievement in a particular field, but rather for his 'intellectual character' and 'universal genius'.[4] Ellis applied his genius mostly to the field of mathematics, in which he was rather prolific, but his approach to mathematics was too leisurely to be called professional or specialized. Some even considered mathematics to be 'the least of his resources', encouraging him to move beyond the narrow Cambridge bounds of Mathematics and Classics and to pursue research in physical science too.[5] The general sentiment seems to have been that Ellis's unmistakable genius was such that it allowed him to be a polymath; his was a universal genius, not a mathematical, philosophical, scientific or literary one.[6] Other factors of course also played a role in Ellis's polymathic capacity to move between disciplines, such as the lack of pecuniary motivation combined with a personal aversion to narrowness and competition. The same goes for the issue of why, despite or perhaps because of his particular kind of genius and polymathy, Ellis has been largely forgotten. Throughout his life, Ellis struggled with poor health, and from about 1849–50 onwards, when he was only in his early thirties, he became increasingly incapable of doing sustained scholarly work. Ellis had only some ten productive years, which makes one wonder what else he might have done, had his life been longer and his sufferings, both physical and mental, less than they actually were.

One name must be mentioned in relation to Ellis's polymathic genius, that of William Whewell, the towering figure of Victorian science, Master of Trinity College, Cambridge, and Ellis's brother-in-law.[7] It may be said that Ellis was a genius by birth, but it is more interesting to see how his genius was the result of cultivation, which gave it its particular character. What was absolutely crucial in this

[3] Anonymous. [James David Forbes]. "Robert Leslie Ellis," *The Athenaeum* 1685 (11 February 1860), 205–206, on p. 206.

[4] George Boole. "On the application of the theory of probabilities to the question of the combination of testimonies or judgments," *Transactions of the Royal Society of Edinburgh* 21:4 (1857): 597–653, on p. 597; Francis Galton. *Hereditary Genius*. 2nd Edition (London: Macmillan, 1892), 18.

[5] Anon. [Forbes], "Robert Leslie Ellis," 206.

[6] For a study of the category of 'genius' see, for instance, James Engell, *The Creative Imagination: Enlightenment to Romanticism* (2013 [1981]). Harvard: Harvard University Press. For an account of the cultural significance of genius in early Victorian Britain see Richard Yeo, "Genius, method, and morality: Images of Newton in Britain, 1760–1860," *Science in Context* 2:2 (1988): 257–284.

[7] On Whewell's life and work see Menachem Fisch, *William Whewell: Philosopher of Science* (Oxford: Oxford University Press, 1991); Menachem Fisch and Simon Schaffer (eds.), *William Whewell: A Composite Portrait* (Oxford: Clarendon Press, 1991); Richard Yeo, *Defining Science: William Whewell, Natural Knowledge, and Public Debate in Early Victorian Britain* (Cambridge: Cambridge University Press, 1993); and Lukas M. Verburgt (ed.), *William Whewell: A New Companion* (University of Pittsburgh Press, forthcoming).

regard was Whewell's intellectual programme: that of the reform of the Baconian inductive philosophy, a reform informed by a Christian belief in the spiritual character of human knowledge which was meant to apply to, and reshape, all areas of science and society, including natural science, morality, politics and economics.[8] At the core of this programme stood the hope that science and religion could work in harmony and the resistance against all philosophical and scientific tendencies – materialism, naturalism, utilitarianism – which assumed or advocated that science and religion were in conflict.

Ellis was one of its torchbearers. Upon his arrival at Cambridge, the programme came to inform many of his scholarly endeavours. It was congenial to his mind not so much, or at least not only, because he agreed with all its doctrines, but because it resonated with his kind of polymathy which, much like Whewell's, was, to use Peter Burke's phrase, 'centripetal': Ellis was interested in, and had a vision of, the unity of knowledge and reality, and believed that its different parts somehow fitted together.[9] Whewell was, and could be, 'active', 'general' and 'serial' – to use three other typologies from Burke's *The Polymath* – in carrying out the twin tasks of defining induction and popularizing it, writing many books and articles on mechanics, political economy, history and philosophy of science, natural theology, education and moral philosophy. Ellis's polymathy is characterized, first and foremost, by simultaneity: his life was simply too short to move from field to field as the years passed. He did everything all at once. What he did was nothing less than impressive, even when focusing only on work readily identifiable as contributing to the Baconian cause. Among many other things, Ellis provided new foundations for probability theory along Whewellian lines, he canonized a Whewellian interpretation of Bacon in his 'General Preface' to the *Works of Francis Bacon*, and he wrote a paper on the formation of bees' cells which provided Whewell with further, anti-evolutionary proof of a divine natural order.

The connection between Whewell's and Ellis's polymathy does not just consist in its interaction and overlap. It also exhibits a striking parallelism: they were both polymaths who were forgotten almost immediately upon their deaths, Ellis in 1859 and Whewell in 1866. The reason for this may well have been their very polymathy, their particular zeal for 'universal knowledge', which met with appreciation and great caution among their colleagues.[10] The breadth of their activities had been rather unusual even in an age when it was still possible to move freely between disciplines. By the 1860s, however, the increasing specialization and

[8] See Laura J. Snyder, *Reforming Philosophy: A Victorian Debate on Science and Society*; and William J. Ashworth, *The Creation of Knowledge: Trinity College, Cambridge, and the Sinews of Authority (1812 to 1875)* (Pittsburgh: Pittsburgh University Press, 2021).

[9] See Burke, *The Polymath*, 6.

[10] William Whewell to Rev. G. Morland, 15 December 1815, quoted in Isaac Todhunter, *William Whewell. D.D. An Account of His Writings*, 2 vols. (London, 1876), vol. 2, 10. Cf. James David Forbes to Robert Leslie Ellis, 14 February 1836, SAUL 293.

professionalization of intellectual life undermined not only the value of their kind of polymathy but also the belief in the unity of science and religion which had inspired it.[11]

Perhaps the central question confronting those who read and study Ellis today is not so much the *what* as it is the *how* and *why* of his oeuvre; not the details of this or that paper – Ellis never wrote a book – but the way in which he arrived at, the reason for his decision to write about, the approach he pursued in studying and the connections he saw between the texts he produced. This makes his life key to his work, if only because until 1849, when he was seized with rheumatic fever in San Remo, Ellis lived to read and wrote to live: his was the kind of bookish life where reading and writing was fraught with existential concerns, both personal, intellectual and spiritual.

Ellis's polymathy offers both an opportunity and a challenge. On the one hand, as borne out in the chapters of this volume, it provides an entry point into wider themes in the history of nineteenth-century British education, academia and scholarship, such as the value and limitations of the Cambridge curriculum, the kind of mental training needed for the Tripos examinations, the changing cultural conceptions of the 'genius', and the intersection between philosophy and mathematics in recent developments like symbolic algebra. On another level, the study of a polymath like Ellis also shows that inter-, multi- or even transdisciplinary historical research is not merely often recommendable and profitable but at times simply unavoidable. It would arguably have been impossible for a single author to cover the ground, both in terms of depth and breadth, covered in the chapters making up this book. On the other hand, Ellis's polymathy makes it very difficult to obtain an exhaustive overview of all the aspects of his life and work, let alone of their many and various overlaps and tensions. Some important topics are here merely touched upon, such as Ellis's coping with his decade-long illness – from 1849 until his death in 1859 – his study of bees' cells, which in 1858 was brought to Charles Darwin's attention,[12] and his forays into the study of law, the only field in which he briefly desired academic preferment.

My hope is that this volume will encourage others to take up these topics, allowing for an even richer understanding of Ellis. And my hope for this understanding is that it will not just save Ellis from oblivion or restore him to a place on the early-Victorian Cambridge landscape but that it will also give rise to the study of why someone like him is forgotten and how this crowded landscape changes once he is placed on it (Fig. 1).

[11] See, in this context, for instance F.M. Turner, "The Victorian conflict between science and religion: a professional dimension," *Isis* 69 (1978): 335–376.

[12] See Charles Darwin to W.B. Tegetmeier, 2 October [1858], in F. Burkhardt and S. Smith, eds. *The Correspondence of Charles Darwin. Volume 7: 1858–1859. Supplement 1821–1857* (Cambridge: Cambridge University Press, 1991), 160.

Fig. 1 Portrait of Robert Leslie Ellis. Taken from a volume of watercolours of eminent pupils of William Hopkins, painted by T.C. Wageman (TCL, 307. bb.85.95). Reproduced by kind permission of the Master and Fellows of Trinity College, Cambridge

Robert Leslie Ellis: Life and Work

The aim of this introduction is to provide a brief and cursory overview of Ellis's life and work that may serve as a background to the chapters that follow.

The mere facts of Robert Leslie Ellis's life, as Harvey Goodwin noted, are few and simple. 'It was short, quiet, uneventful, but very full of suffering'.[13] Ellis was born on 25 August 1817 in Bath, the youngest of six children of Francis Ellis (1772–1842) and Mary Ellis (née Kilbee) (1777–1847). As a young boy, Ellis spent most of his time in the company of his father, a cheerful, active and well-cultivated man and one of the founders of the Bath Literary and Scientific Institution. His character and way of dealing with his son, as a child, had a great influence on Ellis throughout his life, in which the death of his father in 1842 would be the 'greatest grief'. From his mother, Ellis is said to have inherited his lifelong tendency towards sickliness and depression, with 'blue devils' occasionally haunting him. Ellis received all his education at home from two private tutors, one in classics and another in mathematics, starting in 1825. At the age of ten, he was reading Horace, Virgil and Xenophon as well as Cuvier's *Theory of the Earth*, Richard Whately's *Elements of Logic* and the *Edinburgh Review* and had already made a

[13] Harvey Goodwin, "Biographical memoir, of Robert Leslie Ellis," in William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co., 1863), ix–xxxvi, on p. xi–xii.

number-theoretic discovery, recorded by his father.[14] By 1830, he was well-versed in mechanics and making rapid progress in the calculus. Due to his frequent conversation with his seniors, and the almost complete lack of interaction with peers, Ellis developed an elderly sobriety of manner that would distinguish him from his contemporaries, making it difficult for others to believe that he had ever been a boy and for him to engage in close bonds of intimacy or friendship.

Since money was not an issue, Ellis was enrolled as a Pensioner at Trinity College, Cambridge, in July 1834. Before going up there, he became a pupil of the Rev. James Challis at Papworth St. Everard, later Plumian Professor of Astronomy at Cambridge, who prepared students for the Cambridge Entrance Examination. Because of ill health, however, Ellis had to disrupt his studies there after 2 months and to delay his entrance to Cambridge. In October 1836 he matriculated at Trinity College as a pupil of George Peacock, the onetime member of the Analytical Society and prominent mathematical reformer, who discovered to his amazement that the 20-year-old Ellis was reading Robert Woodhouse's *Isoperimetrical Problems* (1810) on the calculus of variations.[15] Unlike other reading men, Ellis studied mathematics on his own and, as his sight was then already weak, largely by making mental notes: he listened to Peacock's lectures and had such works as J.H. Pratt's *Mechanical Philosophy* (1836), the first Cambridge treatise on Laplace's analytical treatment of the earth's shape, read to him. But knowing that the all-important Tripos was first and foremost a test of speed and accuracy, in his last terms he had the advantage of the direction of William Hopkins, the famous 'Senior Wrangler-maker', if only to arrange his reading and put it in a suitable form.

The Tripos examinations of the 1840s were spread over 6 days, covering 'pure' and 'applied' questions (then called 'mixed mathematics') – more than five hours each day, with Sunday off.[16] In Ellis's year, the examination took place in the Lecture Rooms of Trinity College, but at his special request he was examined privately in a separate room. 'I am very cool', Ellis wrote in his diary, 'yet shall play a losing game' (5 January 1840). A few days later, however, he graduated – as Hopkins and Peacock had expected – as Senior Wrangler, going on to win that year's First Smith's Prize. In September, there followed the Fellowship Examination. Ellis passed and was elected Fellow of Trinity College in October 1840, with meant that

[14] See 'Untitled document', Whewell Papers, TCL, Add.Ms.c.67/129. Unless otherwise noted, all further references to 'TCL' are to this collection ('Whewell Papers').

[15] There are two letters from George Peacock to Ellis's father among the 'Correspondence of Lady Affleck' in Trinity College Library. See TCL, Add.Ms.a.79/326-327. On Woodhouse's influence on Cambridge mathematics, and on the reformers of Charles Babbage, George Peacock and John Herschel in particular, see for example Harvey W. Becher, "Woodhouse, Babbage, Peacock and modern algebra," *Historia Mathematica* 7:4 (1980): 389–400.

[16] For an account of the development of the Mathematical Tripos at Cambridge see, for example, Tony Crilly, "Cambridge. The rise and fall of the Mathematical Tripos," in Raymond Flood, Adrian Rice and Robin Wilson, eds. *Mathematics in Victorian Britain* (Oxford: Oxford University Press, 2011), 17–32. For the physical side of the tripos examination, in which context Ellis is somewhat of an anomaly, see Andrew Warwick, *Masters of Theory. Cambridge and the Rise of Mathematical Physics* (Chicago & London: The University of Chicago Press, 2003), chapter 4.

he was free from earning a living for several years. Since he did not take Holy Orders, his Fellowship expired in 1849, that is, for 7 years after his MA degree, which he had obtained in 1842.

After taking his degree, Ellis's ambition was to read for the bar, to which he was duly called in 1840. But in the following years his worldly position unexpectedly changed, with the death of his father and both his elder brothers. Ellis inherited considerable Irish property and was thus deprived of the chief inducement to work as a lawyer. Still, as he 'loved law in the abstract exceedingly', he devoted much time to the study of law, leaving behind several notebooks on Roman Law.[17] His ultimate ambition to be appointed Professor of Civil Law would remain unfulfilled, however. At Bath, in 1841-2, Ellis briefly considered entering political life as a Whig candidate for the representation in Parliament of his native city, being attached to Sir William Napier (1785–1860). Nothing came of this and in 1842-3 Ellis returned to Cambridge, making Trinity College his home, though not with any very definite purpose.

During the period of his Fellowship, Ellis undertook, in collaboration with two other Trinity men – James Spedding and Douglas Denon Heath – a complete edition of Francis Bacon's works, published in seven volumes between 1857 and 1859. Ellis was responsible for the first three volumes, containing the Philosophical Works, for which he wrote several prefaces as well as a 45-page 'General preface'. An intellectual task much to his taste, Ellis's contributions to the *Works* are among the most valuable texts which he has left behind and perfectly indicative of his wide reading and philosophical commitments. Ellis's emphasis on the need for a reformed Baconian methodology in the 'General preface' was lauded by William Whewell, with whose natural theology and idealist philosophy of science it was largely in agreement. For example, following Whewell, Ellis argued for a view of knowledge in which the individual mind is able to arrive at a priori truths about the world because it shares in the thoughts of the divine mind which created that world. Like Whewell, what Ellis valued in Bacon was the spirit, not the matter of his work: this 'anti-modern' spirit was essentially that of the unity of religion and science, of faith and knowledge. As Ellis quoted Bacon: 'There is no such opposition between God's word and His works', adding that 'both come from Him who is the Father of lights, the fountain of all truth'.[18] Ellis was not a mere follower of Whewell, however, as he took it as his task to reconcile Whewell's philosophy of science with other disciplines, notably probability theory, thereby allowing for the possibility that it would need to be updated or reformed.

Bacon and philosophy were just two of Ellis's many intellectual interests, of which mathematics was perhaps the central one. Ellis always stood in an ambiguous relation to the field in which he was most prolific and to which he made several memorable contributions. On the one hand, he studied mathematics from the age of eight, graduated Senior Wrangler, won the First Smith's Prize, was a Moderator

[17] Goodwin, "Biographical memoir," xviii. See TCL, Add.Ms.a.218/36-9, a.220/4, a.221/14 and 222/3-8.

[18] Robert Leslie Ellis, "General preface to the Philosophical Works," in *SEH* 1 (1857): 21–67, on p. 64.

(1844) and Examiner (1845) in the Mathematical Tripos, established a new Cambridge tradition by publishing a complete set of solutions to the problems he and his co-moderator, Matthew O'Brian, had set in 1844, edited several volumes of the *Cambridge Mathematical Journal*, prepared a masterly report on the recent progress of analysis for the British Association (1846), and wrote some forty papers on various mathematical topics. On the other hand, although he did give some college lectures on higher mathematics, if only as locum-tenens for friends, Ellis never had a private pupil, and never expressed any desire to be appointed professor of mathematics. In fact, when the Lucasian Chair of Mathematics in the University of Cambridge fell vacant in 1849, upon Joshua King's resignation, Ellis declared that he would not even agree to be nominated as a candidate. '[I]t is a mistake to suppose', wrote Goodwin, 'that Ellis was in any exclusive or even preponderating degree devoted to mathematics; his mathematical power was no doubt very great, but […] not greater than several other powers […]'.[19]

During 1847-48 Ellis visited Malvern, a popular spa town, for the benefit of his health, while still making Trinity his headquarters. When the tenure of his Fellowship expired, in 1849, he decided to travel to the Continent, partly for the sake of travelling, partly from the belief that a warmer climate might improve his health and partly to complete his work for the Bacon edition. Ellis travelled to Nice, in the south of France, in the autumn of 1849, aged 32. When he left that town for Rome on 13 December, he was stopped at San Remo, Italy, by a severe attack of rheumatic fever, which for several days put his life in danger. 'What I have suffered in body & spirits', he wrote in a letter dated 2 January 1850, 'I am not very willing to call to mind. So it is here I am, in almost a helpless state, scarcely able to sit up for two or three hours'.[20] After staying at San Remo for nearly 3 months, in March 1850 Ellis returned to England an invalid. He visited several places after his return – London, Brighton, Bath, Malvern and Tunbridge Wells – consulting various doctors without any result. In 1853, having given up all hope of recovery, Ellis decided to settle at Anstey Hall in Trumpington, a village two miles from Cambridge of which his friend John Grote – who in 1855 would succeed Whewell as Knightbridge Professor of Moral Philosophy – was vicar. The long end of his short life was a painful process of gradual physical disintegration and a constant looking of death in the face. As he wrote in one of his last letters, of 22 February 1859: '[I]t is nearly six years since I have looked forward to six weeks life. The curse of Moses "Thy life shall hang in doubt before thee and thou shall fear day and night and have none assurance of thy life" has been fulfilled here if ever anywhere'.[21] At first, he could drive out in a carriage, but eventually he became entirely confined to the house and then to his bed, unable to enjoy the company and conversation of friends.

Despite his worsening physique, Ellis's intellect remained intact. 'It was a wonder to note the perfect action of mind, at a time when the body was a mere distorted

[19] Goodwin, "Biographical memoir," xx.

[20] Robert Leslie Ellis to William Walton, 2 January 1850, TCL, Add.Ms.c.67/12.

[21] Robert Leslie Ellis to William Walton, 22 February 1859, TCL, Add.Ms.c.67/45.

[…] heap of skin and bones'.[22] During the first years of his illness, Ellis was still able to give some attention to Bacon, dictating the notes and prefaces which would appear in the *Works*. It was only in 1853 that he finally handed over his papers to Spedding. After this moment, he could not bear the subject of Bacon to be spoken of. At Anstey Hall, he sometimes managed to amuse himself with various subjects of study, carrying out mathematical investigations 'in his head', that is without pencil and paper, and dictating remarks on such topics as bees' cells, Roman money, vegetable spirals and the construction of a Chinese dictionary.[23] Always having been fond of the study of language, Ellis was well-versed in French, German, Italian, Greek and Latin, translated Danish and Spanish ballads, studied Gothic and Sanskrit, and was found one day reading the New Testament in Swedish, a language which he had picked up since he had been ill.

After years of suffering, and no longer able to walk, read or write, Ellis died on 12 May 1859, aged 41, and was buried in Trumpington churchyard.

Ellis's legacy – or, more precisely, its creation – is a story all in itself, bringing together and dividing his small circle, consisting of Lady Affleck (his sister), William Whewell (his brother-in-law), John Grote, Harvey Goodwin (his 'official' obituarist), William Walton (his literary executor and editor of his collected works), John Pilkington Norris (his 'unofficial' obituarist), Augustus De Morgan and James David Forbes. Shortly after her brother's death, Lady Affleck asked Forbes, previously Professor of Natural Philosophy at the University of Edinburgh but then just appointed Principal of the United College of St. Andrews, to write the obituary. Forbes accepted, asking William Thomson (Lord Kelvin) for notes on Ellis's 'mathematical qualities of mind'.[24] On De Morgan's advice, Forbes's obituary, which would appear in the *Athenaeum* on 11 February 1860, was distributed by Lady Affleck to Henry Longueville Mansel (Oxford) and George Boole (Queen's College, Cork).[25] It was Goodwin rather than Forbes who wrote the 'Biographical Memoir', included in the *Mathematical and Other Writings of Robert Leslie Ellis* (1863), edited, at Lady Affleck's request, by Walton, who had been Ellis's closest friend. At one point in his memoir, for which he made good use of some of the recollections of Ellis recorded in Norris's 'Notes, privately printed', Goodwin took issue with Forbes's otherwise kind and warm-hearted obituary notice.[26] According to Forbes, there was a parallel between Ellis and his late friend Duncan Farquharson Gregory, the founder of the *Cambridge Mathematical Journal* who had died in 1844, aged

[22] Goodwin, "Biographical memoir," xxiii.

[23] Ellis communicated most of his mathematical investigations, either by dictation or by letter, to William Walton. Only two of these were published in *The Mathematical and Other Writings of Robert Leslie Ellis*; one on the retardation of sunrise and the other a new solution of a problem in the first book of Newton's *Principia*.

[24] James D. Forbes to William Whewell, 16 July 1859, TCL, Add.Ms.a.204/127.

[25] See Augustus De Morgan to Lady Affleck, 7 December 1859, TCL, Add.Ms.a.202/139. Forbes, in his obituary of Ellis in the *Athenaeum*, to which it was communicated by De Morgan, refers to an obituary of 'last May' in that same magazine. This notice has not been found. The *Athenaeum* of 14 May does contain an obituary notice of a 'Charles Robert Leslie', however.

[26] See J.P. Norris, 'Notes, privately printed (1853-9)', *CUL*, Cam.c.859.18.

30. Ellis perhaps had more 'charm of character', and he may have lacked Gregory's 'eccentricity', but their 'tastes', 'pursuits' and 'mode of life' were essentially the same.[27] Goodwin not only questioned the parallel; he disputed that there was a likeness at all. Goodwin's own memoir, in turn, was 'reviewed' by Norris in the *Athenaeum* in 1864.[28] Norris lauded Goodwin's sketch of Ellis the man and scholar, but felt that not enough emphasis had been put on Ellis the devout believer and conservative thinker:

> To be a witness against the characteristic tendencies of modern thought; to protest against idolatry of all kinds, – idolatry of intellect, of success, of physical science, of high art, – […]; to manifest in the very highest efforts of speculation the same principle of obedience and reverence to One who was yet higher […]; to ascent where few could follow him, and, in those regions of pure intellect, make heard the ever-lasting commandment, Thou shalt have none other gods but One; this seemed to be the appointed purpose of his life and of his death.[29]

Forbes, Goodwin and Norris each captured something essential about Ellis – the worldly, the scholarly and the religious. At the same time, as their disagreement shows, it is hard to say which of these was most essential and whether, and if so how, they are related and could possibly be reconciled. Ellis, indeed, was a polymath in learning and polymorphous in character. The aim of the present volume is to disentangle these aspects and to re-assemble them into a well-rounded, complex picture of Ellis's life and work.

Structure of the Book

The structure of the book is as follows. Part I consists of seven chapters, each focusing on a major aspect of Ellis's life and work, ranging from his home schooling in classics and mathematics (Chaps. 1 and 2, respectively) and his postgraduate Cambridge life (Chap. 3) to his contributions to mathematics (Chap. 4) and probability theory (Chap. 5), his philosophy and Bacon scholarship (Chap. 7) and his religious-mathematical outlook on human knowledge (Chap. 7). After an introductory chapter on Ellis's archival remains, held at Trinity College, Cambridge (Chap. 8), Part II presents an annotated selection of his diaries and correspondence. Both selections are preceded by a 'Note to the Reader' containing background information and editorial remarks. They are followed by three appendices. Appendix 1

[27] Anon. [Forbes]. "Robert Leslie Ellis," 206.

[28] See J.P. Norris, "*Biographical Memoir of Robert Leslie Ellis, M.A.* By Harvey Goodwin, D.D., Dean of Ely," *The Athenaeum* 1900 (26 March 1864): 436–437. The text was not announced as a 'review', but it is called thus in a small volume entitled 'Tracts. R.L. Ellis' (TCL, 5.c.85.5/8), held in the basement of Trinity College Library, Cambridge, where it appears as 'Review of *A Biographical Memoir of Robert Leslie Ellis*, M.A. By Harvey Goodwin, D.D., Dean of Ely. Partly inserted in *The Athenaeum* of March 26, 1864'.

[29] Norris, "*Biographical Memoir of Robert Leslie Ellis, M.A.* By Harvey Goodwin," 437.

provides a complete bibliography of Ellis's writings and Appendix 2 gives a list of Ellis's mathematical reading before he went up to Cambridge in 1836, emphasizing how remarkably precocious he was and showing what books and editions were available to someone in his situation. Appendix 3 gives a chronological list of Ellis's diaries, including manuscript references (Add.ms.) and date ranges. Throughout Part I and Part II, the diaries are referred to by giving entry dates; the list in Appendix 3 allows the reader to see which diary is being referred to.

Ellis's diaries and letters offer a unique insight into his life as a young prodigy at Bath, as a serious reading man at Cambridge in the 1830s, as a Fellow of Trinity College in the 1840s and as a chronically ill man in the 1840s, when he was still only in his twenties. The topics in the diaries range from daily life at Bath – the tutorial regime, visits to the Bath Scientific and Literary Institute, fencing and horse-riding, early reflections on mathematical, philosophical and existential themes – to the years at Cambridge just prior to and shortly after becoming Senior Wrangler – touching on college social life and the Tripos examinations, both as a student and as a moderator. As such, the diaries deserve to take their place as a major primary source of information on Cambridge in the 1830s–40s, alongside Charles Bristed's *Five Years in an English University* and *The Letters of Alexander Chisholm Gooden, 1831–1841*.[30] Whereas the diaries cover the years 1827–1845 – the vast majority dating from the 1830s, when Ellis was a dedicated diarist – most of Ellis's letters are from the decade between the late-1840s and late-1850s. They are both more professional, touching for example on publications in, and the editing of, the *Cambridge Mathematical Journal* in letters to William Thomson, and much more personal and tragic, recording in detail the course of his deteriorating health in letters to William Walton and John Grote.

Ellis's diaries and letters have been transcribed and annotated in collaboration with Christopher Stray. They were made available to all contributing authors, partly to make the transcriptions as useful as possible and partly to ensure that Part I and Part II would together form an integrated whole. More will be said about the selection of diaries and letters in the 'Notes to the Reader'; suffice it to say at this point that, throughout the chapters, diary entries are referred to by giving dates between parentheses, directly following the cited text. A full list of diary entries, including manuscript numbers and dates, can be found in Appendix 3.

All bibliographical information is provided in footnotes, with full details given the first time a work appears in a chapter and abbreviations used on its next appearance(s) in that same chapter. A general bibliography can be found at the end of the book.

Lukas M. Verburgt

[30] See Christopher Stray, ed. *An American In Cambridge: Charles Astor Bristed's* 'Five Years in an English University' (Exeter: University of Exeter Press, 2008); Jonathan Smith and Christopher Stray, eds. *Cambridge in the 1830s: The Letters of Alexander Chisholm Gooden, 1831–1841* (Woodbridge: The Boydell Press, 2003).

Contents

Part II Manuscripts

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Abbreviations

CUL	Cambridge University Library
ODNB	Oxford Dictionary of National Biography
SEH	Spedding-Ellis-Heath edition of *The Works of Francis Bacon.* 7 vols. (London: Longman & Co., 1857–1859)
SAUL	St Andrews University Library
TCL	Trinity College Library, Cambridge

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Part I
Chapters

Chapter 1
From Bath to Cambridge: The Early Life and Education of Robert Leslie Ellis

Christopher Stray

Robert Leslie Ellis was born in Bath on 25 August 1817.[1] His father, Francis Ellis (1772–1842), had held a position in the Admiralty, but resigned when he became the principal heir of his uncle Henry Ellis, formerly Governor of Nova Scotia, who on his death in 1806 left him £10,000 and extensive landholdings in Ireland and elsewhere.[2] Francis and his wife Mary, née Kilbee (1777–1847), had six children, of whom Robert, born in 1817, was the youngest.[3] The family lived in a succession of large houses in Bath, where Francis Ellis, a well-known local figure, was one of the

[1] Robert was named for his paternal grandfather Robert Ellis and his wife Penelope, née Leslie. 'Leslie' was thus not a forename but a second surname, not uncommon in the 19th century. Harvey Goodwin referred to 'dear Leslie Ellis' in a letter to William Whewell of 16 May 1859 (TCL, Add. Ms.a.68/31); Ellis signed himself 'R. Leslie Ellis' in a letter to his father of 13 December 1838 (TCL, Add.Ms.a.79/171). Grote's 1872 account mistakenly makes his mother a Leslie. See John Grote. "Robert Leslie Ellis. A study of character," *Contemporary Review* 20 (1872): 56–71, on p. 56.

[2] Henry Ellis's official titles were 'Governor of Georgia and Nova Scotia, Vice-Admiral, High Sheriff and Provost-Marshal of Grenada, Tobago, St Vincent and Dominica'. His Irish landholdings were worth about £60,000: Statement of personal property 1 January 1809, Add.Ms.a.79/11. The current equivalent value would be almost £3 million. Robert Leslie Ellis's estate was worth about £140,000 when he died in 1859, of which his sister Frances inherited £60,000. See M.E. Bury and J.D. Pickles, eds. *Romilly's Cambridge Diaries 1848–1864* (Cambridge: Cambridge University Press, 2000), 352.

[3] In the 1841 census (in which ages were rounded down to the nearest 5 years), Mary Kilbee's age was listed as 60. A Mary Kilbee baptised in Dublin on 17 June 1777 was the daughter of William and Everina Kilbee; her mother's Christian name suggests that this Mary Kilbee was Ellis's mother.

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L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0_1

founders of the Bath Literary and Scientific Institution, founded in 1823.[4] The Institution had a well-stocked library which took in both British and continental books and periodicals, and the teenaged Ellis frequented it regularly, reading avidly and conversing with the adult members, who included scholars and scientists of some distinction. His father involved himself in Ellis's education and was himself a well-educated and inquiring man; his uncle had described him as 'really a very deserving young man of uncommon abilities and possessed of more scientific and other knowledge than [one] could expect at his years.'[5] In an account of the Bath literati published in 1854, Francis Ellis was included in a list of 'men with intelligent and well-informed minds', and a later supplement stated that 'Francis Ellis had an enlarged mind, was a good classic, a superior mathematician, and a generally well-informed man'.[6] Ellis's library contained several hundred books in 1841, when an inventory was taken.[7]

From the age of eight Robert Ellis received all his schooling at home.[8] His mathematical tutor was Thomas Stephens Davies, who taught Ellis until he left Bath for a post at the Royal Military Academy in Woolwich in 1834. Davies, a well-known figure in the history of mathematics, is dealt with in June Barrow-Green's chapter; little is known of his early years, but his surname is Welsh, and he told Ellis at one point that he 'preferred Cambrian mathematics to Cambridge' (10 June 1833). Ellis's classical tutor was Hiram A.S. Johnston (1799–1867), a more obscure figure, probably of Scottish descent but born in Tenbury in Worcestershire, whose lessons continued until Ellis left for Trinity in 1836.[9] In addition he had tutors for French, German, fencing and riding. The progress of Ellis's schooling can be followed through his diaries, which began on 27 May 1827, when he was nine (Fig. 1.1).

The text on the inside front cover runs as follows:

> Journal of Robert Leslie Ellis, commenced 27 May 1827.
>
> Why should my days sink to oblivion? & Fanny's be preserved?
>
> The Cave: The Cave was a partition from the bedroom of mamma in which were papa's regulator & telescopes & great part of mamma's books; a delightful place, frequented for the sake of the books.

[4] Before the Institution opened, local literati had met in bookshops, notably that of John Bull, taken over in 1804 by John Upham. Joseph Hunter wrote in 1853 that 'The Committee [of the Institution] usually met at the house of Mr Upham, the respected and intelligent bookseller on The Walks'. Joseph Hunter, *The Connection of Bath with the Literature and Science of England* (Bath, 1853), 15. Hunter mentioned that 'Mr Ellis deserves particular notice' (Hunter, *Connection*, 14).

[5] Edward J. Cashin, *Governor Henry Ellis and the Transformation of British North America* (Athens & London: The University of Georgia Press, 1994), on p. 221.

[6] George Monkland, *Supplement to* The Literature and Literati of Bath (Bath, 1855), on p. 69.

[7] This was taken on 9–10 June 1841 at his home, 12 Royal Crescent, Bath, and ran to 23 pages: copy at Add.Ms.c.223/34. He died on 10 May 1842 in London.

[8] In his diary for 18 August 1834 Ellis recorded that Johnston had tutored him 'during nearly nine years'. The similar reference to T.S. Davies ('more than nine years', 30 June 1834), shows that he had been hired before Johnston.

[9] Johnston lived at 5 York Place in Bath; Thomas Johnston, also a classical tutor, lived at no.6 and was probably his nephew. Both were listed in the 1859 Bristol directory as classical teachers.

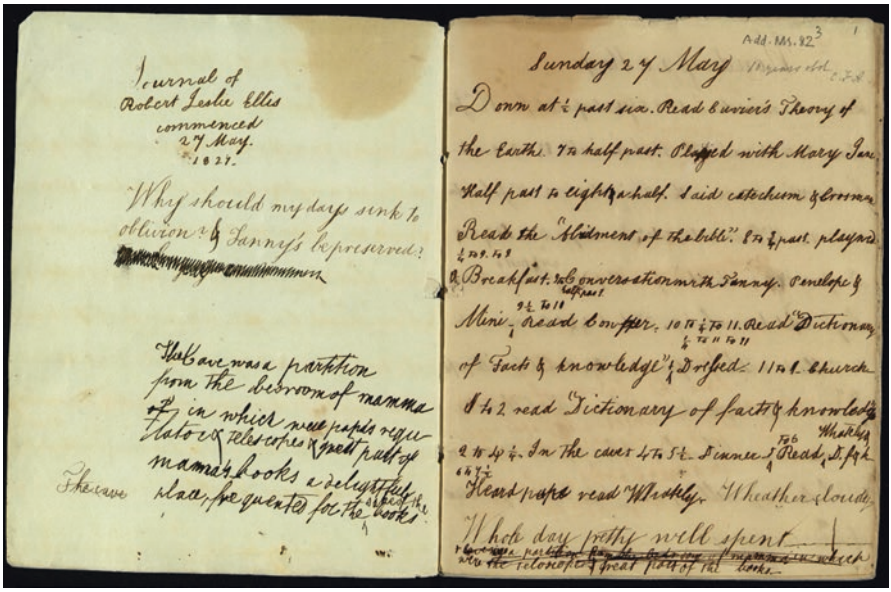

Fig. 1.1 The inside cover and first page of Ellis's first diary. (Reproduced by kind permission of the Master and Fellows of Trinity College, Cambridge)

As this suggests, the initial impulse to begin a diary seems to have been a competitive one.[10] Fanny herself preserved the diaries after Robert's death in 1859, adding annotations and on occasion cutting pages out.[11] The, Cave, became a favourite place for reading; the 'regulator' was a clock used to keep other clocks in time. Francis Ellis also kept a telescope in the Cave, and brought it out to observe eclipses with his son.

The diary proper begins on page 1:

> Sunday 27 May [MS annotation in pencil]: 10 years old E.F.A.[12]
>
> Down at ½ past six. Read Cuvier's Theory of the Earth. 7 to half past, played with Mary Jane. Half past to eight and a half. Said catechism & Crosman.[13] Read the 'Abridgment of

[10] Other siblings also kept diaries, according to Grote, "Study," 60. On diarising in general, see Robert A. Fothergill, *Private Chronicles: A Study of English Diaries* (London: Oxford University Press, 1974), and Rudolph Dekker (ed.), *Egodocuments and History: Autobiographical Writings in Its Social Context since the Middle Ages* (Hilversum: Uitgeverij Verloren, 2002).

[11] In this first opening she noted that he was then aged ten: in fact, he was nine, his tenth birthday being on 25 August 1827.

[12] Everina Frances Affleck, Ellis's eldest sister.

[13] Henry Crossman, *An Introduction to the Knowledge of the Christian Religion. In Two Parts. Part I. An Exploration of the Most Material Words and Things in the Church Catechism […]. Part II. An Explanation of the Two Covenants […] and some Religious Terms, etc.* (London, 1742). The book went into more than 20 editions, the last in 1861.

> the bible'.[14] 8 – ¾ past, played. ¼ to 9 to 9, Breakfast. 9 to ½ past, Conversation with Fanny, Penelope & Mini. 9 ½ to 10 Read Cowper. 10 to ¼ to 11, read Dictionary of facts and knowledge.[15] ¼ to 11 to 11 dressed. 11 to 1 Church. 1 to 2, read Dictionary of facts and knowledge. 2 to 4 ¼ In the cave Whately.[16] In the cave 4 – 5 ½. Dinner. 5 to 6 read Whately & D[ictionary of K[knowledge]. 6 to 7 ½ Heard papa read Whately.
>
> Weather cloudy. Whole day pretty well spent. (27 May 1827)

What makes this page atypical is that it was written on a Sunday; hence the lack of tutorial visits, the visit to church and, in all likelihood, the inclusion of Henry Crossman's *Introduction to the Knowledge of the Christian Religion*. The other titles Ellis mentions (Whately on logic, encyclopedic dictionaries, and Cuvier's *Theory of the Earth*) are fairly typical of his daily reading. Francis Ellis subscribed to Dionysius Lardner's Cabinet Cyclopedia, and Robert devoured each volume as it arrived.[17] On the following day, his classical and mathematical tutors both visited in the morning, for an hour each, and his French teacher ('Mademoiselle') also came; from 1830 he took German lessons from 'Mr Reichel'.[18] There is a striking similarity between this timetable, which carried on during weekdays, and that of a Trinity undergraduate, who would have lectures on classics and mathematics in the morning. Many sons of wealthy fathers will have had classical tutoring, but the inclusion of mathematics is unusual, and might suggest that even at this early stage, Francis Ellis was planning to send his son to Cambridge.[19]

The diary page also gives us a glimpse of Ellis's family. Mary Jane was two years older than Robert, and died aged 16 in 1831: her nickname in the family was 'Mini' or 'Minnie'.[20] Fanny (Everina Frances), the eldest child, was born in 1807 and the last to die, in 1865, the year before her second husband William Whewell, Master of Trinity. Penelope, the middle sister, was born in 1814 and married a clergyman. Robert's elder brothers Francis (Frank) and Henry are not mentioned here, but were both away from home. Frank went to Rugby and Magdalene and then into the army without taking a degree; he died in London on 27 August 1843. Henry also went into the army, and was a lieutenant in the 60th Rifles, stationed in Windsor, when he

[14] Perhaps Thomas Watson, *Epitome of Sacred History, or an Abridgement of the Holy Bible* (London, 1821).

[15] Rev. S. Barrow [pseudonym of Sir Richard Phillips], *A Popular Dictionary of Facts and Knowledge* (London, 1827).

[16] Richard Whately, *Elements of Logic* (London, 1826).

[17] The Cyclopedia was published in 133 volumes from 1829 to 1846. See Morse Peckham. "Dr Lardner's Cabinet Cyclopedia," *Papers of the Bibliographical Society of America* 45 (1851): 37–58.

[18] Samuel Reichel (1787–1857) was pastor of the Moravian church in Charlotte Street, Bath. My thanks to Anne Buchanan, Local Studies Librarian, Bath Record Office, for help in identifying Reichel.

[19] As early as 1830 Ellis was using the Tripos problems printed in the Cambridge University Calendar for practice.

[20] Thanks again to Anne Buchanan (see note 18) for establishing Mary Jane's date of birth; the standard genealogical publications give no birth or death dates. John Grote misdated her death to 1832 in Grote, "Study," 60.

cut his throat on 2 March 1841 after taking an overdose of opium.[21] This must be the 'deplorable affair' referred to by Alexander Gooden in a letter to his and Ellis's friend Robert Jenkins on 21 March, in which he reports that Ellis 'finds the best relief in applying himself to his scientific pursuits'.[22]

Robert thus spent much of his early years in a largely female household. His eldest sister Fanny gave him drawing lesson; until her death in August 1831, his sister Mary Jane joined in some of his reading and was at times taught (and tested) by him. In his biographical memoir of Ellis, Harvey Goodwin remarked that because of this home education there might be observed in him a certain elderly sobriety of manner, not amounting to stiffness, but conveying the impression that he had been accustomed to converse with those older than himself, and standing out in marked contrast with that lively boyish freedom and gaiety which is especially the characteristic of the young men educated at the great public schools.[23]

For a boy who had yet to celebrate his tenth birthday, Ellis's reading was precocious. It included drama, novels and poetry, but consisted mostly of non-fiction, including French mathematical texts; his periods of home reading, often in the 'Cave', were interspersed with conversations with other family members; the final item illustrates his father's involvement with Robert's education. Not mentioned in this first diary page, but frequent later on, are references to walking and riding. Horses were hired from local stables, and the young Ellis often rode, solo or with others, in the countryside around Bath. Some routes became favourites, among them Weston Lane, which began near Ellis's home and led out of the city. In the summer of 1832 he recorded that he 'rode for half an hour on the Weston lane, a locality for which recollections of the elder days has given me an affection, undestroyed by familiarity. I <u>love</u> the Weston lane' (24 June 1832). Rides in company were often taken on the steep downs near the city with his friends Sam and Lousada Barrow.[24]

Ellis maintained cordial relations with Hiram Johnston, who taught him from 1825 to 1834; in the latter year he wrote:

> Read Demosthenes with Mr Johnston, whom I think – & I say it now, because our separation is near – a fair scholar – & a very honourable man – & it's not every body of whom one can say so much – & I will say also during nearly nine years our acquaintance has lasted – we have never had a single misunderstanding. (18 August 1834)

[21] Hence his absence from the 1841 census, when the family home was at no.12 Royal Crescent, Bath. The family had previously lived at no. 18, but moved house in January 1831. The Royal Crescent was the grandest address in Bath, a row of 30 spacious houses built in 1774.

[22] Jonathan Smith and Christopher Stray, eds. *Cambridge in the 1830s: The Letters of Alexander Chisholm Gooden 1831–1841* (Woodbridge: The Boydell Press, 2003), 197. My thanks to Tony Crilly for making the connection.

[23] Harvey Goodwin. "Biographical memoir," in William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co., 1863), xi-xxxvi, on p. xiv. Goodwin had come second to Ellis in the Tripos examination of 1841.

[24] Lousada was named for another local family; Isaac Lousada and Simon Barrow were business partners in the West Indian trade, both of Jewish descent (Barrow was anglicised from Baruch). In 1837 Simon Barrow was Mayor of Bath, the first British Jew to hold such a post; Lousada and two of his brothers became major-generals in the Army.

1.1 Classical Tuition

This reading of Demosthenes with Johnston belonged to the final stage of Ellis's pre-Cambridge education, which had begun with Latin in 1825 and added Greek two years later. His diary contains several forthright comments on the authors he read. 'I do not like Euripides so much as either Aeschylus or Sophocles. He is rather prosy & very unnatural', he wrote on 28 November 1831. He had a particular dislike for Livy: 'I do not like Livy. There is an offensive nationality [nationalism], which disgusts his reader in every line. He always remembers that he is one of the lords of the universe' (5 July 1834). Herodotus, on the other hand, was a delight: 'The style of this writer is delightful – so simple, so naïve so gentle & kind hearted. It was well remarked, that Herodotus is like an intelligent child' (16 July 1834).

Some of Ellis's comments are strikingly mature. In 1834 he declared,

> Leslie states (Enc. Brit. Supp. Clim.) that climate depends on latitude and elevation alone, or at least that other causes produce insensible effects. This mode of mangling the facts to render the investigation purely mathematical involves three obvious errors. (23 May 1834)

In March 1831 he had noted,

> Read Schlegel on the essence of Greek tragedy in the "Theatre of ye Greeks". With a good deal of nonsense which sounds like materialism he shows a good deal likewise, of acuteness & gives a good account of the external necessity & the inward freedom so constantly shown in the Prometheus.[25] (27 March 1831)

He often compares Greek plays to those of Shakespeare and learns from the comparison; and this leads him at one point to comment that 'I do not know why we talk of the Orestes or the Ion, and not of the Macbeth or the Othello, and yet, it seems affectation to drop the article' (11 June 1834). In May 1832, he and Johnston read the description of the beacon fires signalling the fall of Troy at the beginning of Aeschylus' *Agamemnon*. Ellis commented, 'It is rather confused but it indicates a custom of the heroic age which is not much noticed by writers on the subject'. At that point he was writing a dissertation on the heroic age in Greece, and on the previous day had commented that 'An indication of the state of manners in any nation may be found in the treatment of the women. This I discussed as well as I could' (16–17 May 1832).

Ellis's interest in the non-literary aspects of the ancient world was fired by reading the work of the German scholar Arnold Heeren, which was recommended to him by Johnston in January 1831 while they were discussing Livy; Ellis read Heeren's *Manual of Ancient History* in March and April.[26] He went on to read Heeren's work on the Ethiopians:

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[25] Several editions of P.W. Buckham's *The Theatre of the Greeks* (1825) were produced by J.W. Donaldson of Trinity College; the 3rd edition of 1830 included a translation of Schlegel's lectures on Greek drama (pp. 159–418). These had been published in 1814, and in English translation in 1815.

[26] Heeren's book had been published by the Oxford publisher David Talboys in 1829. Heeren's books were praised by his American translator, the historian George Bancroft, for their 'extended range of inquiry, as well as by the minute accuracy of their details'. Arnold H.L. Heeren, *A Manual of Ancient History* (Oxford, 1829), iii.

> I feel a great interest in this, the most distant nation of antiquity, in the people of whom the Greeks knew so little that they supposed them better than their fellow men. Obscurity has a great charm for me; the travels of the present day have left no fairy ground, no region which we may people with bright and golden images.[27] (11 April 1832)

Ellis several times mentioned how much he liked reading Heeren. This is significant as showing that he read outside the relatively narrow Cambridge curriculum, which was dominated by the tradition of minute linguistic study of texts, especially of Greek drama, established by Richard Porson (d.1808).[28] His interest, and perhaps Johnston's too, in classical culture is reflected in a letter he wrote to his tutor when was aged 8:

> Mr Johnstone. Mama had not got the English-Latin Dictionary, she told me it is no matter whether I write in latin [*sic*] or English. Stumbled today, my desk is injured, and my thumb and knee hurt. My sister has a bust of Diana, also one of Appollo [sic]; they are very like one another. I have a horse, who is made in plaster of Paris. His name is Mina, and he is a representation of him. Mina was the horse that ran at a great race in Russia. She also has a Hebe, Isaac Newton, Locke, Antinous, which Frank showed you, a Scot, and papa he lent her Fox. Goodbye Mr Johnstsone. Robert Leslie Ellis.[29]

The area of Classics in which Ellis felt he was weakest was Latin and Greek composition, then a skill heavily emphasised in the Cambridge curriculum and the subject of several university prizes and medals.[30] Johnston had started him on 'nonsense Sapphics' (28 April 1829), after which he tried to write a dozen lines a day.[31] On 10 June he admitted that

> I certainly was not born a poet & making verses is to me 'labour & weariness of the spirit' but of all the parts of my classical education, what I dread most is verse making.[32] (10 June 1829)

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[27] Ellis's later references to the Ethiopians probably came from his reading of Heeren's *Historical Researches into the Politics, Intercourse and Trade of the Carthaginians, Ethiopians, and Egyptians*, also published by Talboys. Both books were probably translated by Talboys himself.

[28] See Christopher Stray. "The rise and fall of Porsoniasm," *Cambridge Classical Journal* 53 (2007): 40–71. On Talboys, see David Vaisey. "Davide Alphonse Talboys," *Oxford Dictionary of National Biography* (2004), doi: https://doi.org/10.1093/odnb/9780192683120.013.26947; Christopher Stray. "Classics," in Simon Eliot, ed. *The History of Oxford University Press Vol. II:1780–1896* (Oxford: Oxford University Press, 2013): 435–70, on pp. 448–50. Ellis called Talboys 'the most beautiful of publishers' (11 December 1832), perhaps referring to his large-scale chronological charts, which used colour and variegated typography.

[29] The letter is dated 18 March 1826 (TCL, Add.Ms.a.80/1). The sister is unidentified but is perhaps Mary Jane. Mina was one of two English thoroughbred horses competing with Cossack horses in a 47-mile race in Russia in 1825.

[30] Some of his (English) poems survive. See TCL, Add.Ms.a.81/68.

[31] Nonsense verses were those in which the metre had to be observed but the meaning of the words was ignored. Two of the lower forms at Eton College were named 'Nonsense' and 'Sense', the latter reached after the former, referring to verses that were both metrically and semantically correct.

[32] Ellis's friend and coeval Alexander Gooden had the same problem. Having been trained at UCL, where composition was optional, he lacked experience at verse making. He overcome this deficiency, however, and became Senior Classic in 1840, when Ellis was Senior Wrangler.

An interesting overlap between Ellis's classical and mathematical tutoring came in 1832, when Davies asked him to translate into English a mathematical text written in Latin by the German mathematician Carl Gustav Jacob Jacobi. As Ellis wrote in his diary, 'Accepted contre gré' [reluctantly] (13 November 1832). Later entries show that he very much regretted agreeing to do this; he worked on it for several months before handing it over to Davies, who later published it under his own name.[33]

The comparison between classical and English writers referred to above reflects both the breadth of Ellis's reading and his ability to reach across it for analysis. A nice example relates to an English writer who discussed classical literature, Francis Bacon:

> […] read Bacon's most beautiful 'Wisdom of the Ancients'. I wish that I could write as this great man, whose style reminds me more of the gorgeousness of Cicero than any author I remember. (3 November 1833)

Six years later he read *The Advancement of Learning*, and commented that

> This is a noble work & which contains more splendid passages than any work I remember of this or indeed any author, excepting perhaps the second book 'De fin. bon. & mal.'[34] (9 May 1839)

1.2 The World of the Bath Literati

The Bath Literary and Scientific Institution was the centre of intellectual life in Bath. Ellis's diaries are full of his visits to the Institution, sometimes with his father but often alone, where he spent hours reading or engaged in conversation with members. A glimpse of the reading room can be seen in Ellis's account of taking a walk on boggy ground: 'I sunk into clay & was like the catalogue at the library, tied by the leg' (10 September 1831). His sense of the Institution as a kind of second home is expressed in a reflective, retrospective diary entry of 1840:

> I remember leaning out of one of the Institution's windows that time & thinking of the many hours I had spent there. I seem still to feel the pressure of the stones against my hands: the calmness of that moment seems to have perpetuated the impression. The perfect calmness of introspective contemplation, of thought wholly dissevered from action, has a charm beyond most things: there is another kind of calmness which I have felt too, when the mind is steadily fixed on one object of pursuit, & feels it's energies rise with the occasion – like the former it arises from the absence of discord between the thinking & willing parts of man. (2 May 1840)

The men Ellis met there included members of the aristocracy (Lord Camperdown and Lord Ashtown were often encountered), the local gentry, and members of the

[33] This was Jacobi's article on plane triangles, first published in 1825. Davies published the translation in Thomas Leybourn's *Mathematical Repository* in 1835, without mentioning Ellis's name.

[34] Cicero's *De finibus bonorum et malorum*.

scientific elite. A notable example of the last category was the Bath-born geologist William Lonsdale (1794–1871), who had been appointed the first honorary curator of the Institution in 1825 and had donated a thousand geological specimens.[35] On 28 March 1829 Ellis looked at the catalogue raisonné of Lonsdale's collection; on 9 April he

> had a long conversation with Mr Lonsdale. He mentioned talking to Mr Walmesley and myself that wishing to ascertain whether the Kimmeridge clay passed between two beds I forget where, he sallied forth with his man carrying a pickaxe and he with a shovel! He said that all yellow clay had once been blue, but by exposure to the air the protoxide became the peroxide. He gave me a few directions to good localities for seeing the inferior oolite, white lias &c. (9 April 1829)

Later that year Lonsdale was appointed curator and librarian at the Geological Society in London, where Ellis met him in 1834. Lonsdale became a celebrated geologist, and gave considerable assistance to Darwin in the study of corals. When Ellis met him, he was eleven to Lonsdale's 34 years. Another geological contact was with Thomas Joyce, a Trinity contemporary, who did not graduate but who gave lectures at the Institution. Ellis met him at the Institution but had mixed feelings about him; he was sceptical in advance of an article Joyce wrote about undergraduate life in Cambridge:

> I see advertised today the new number of the Westminster review: he is the author of 'College life at Cambridge'. I dare say he will be amusing, but he has seen only part of college life. In the first place he has not been through the course. In the second he mixed with but one kind of men. He will be eloquent on pulled fowls & biffins; but he knows nothing of life among the bachelors, of the apostles, of the saints of the Union of the boat clubs &c. He has never been present at the Saturnalia of the college year, at the degree time. A good deal might be made in a light style of all these.[36] (30 March 1841)

The Institution also ran a course of lectures on popular science, and Ellis attended these, often giving highly critical comments on their content and style.

Ellis's friend and patron Colonel William Napier was also dubious about Joyce, whom he called 'a kind of "polished Caliban"' (14 October 1840). Napier (1785–1860) was a soldier, military historian (*History of the Napoleonic War*, 5 vols 1828–40), and controversial radical politician, knighted in 1848. He almost persuaded Ellis to stand for parliament for Bath, on a platform shared with the radical John Roebuck, MP for Bath 1832–47. In 1835 Ellis declared that Napier was 'a man of great talent in some things – eloquent and energetical […] but his mind is not

[35] Paul Tasch, "Darwin and the forgotten Mr Lonsdale," *Geological Magazine* 87 (1950): 292–6; Martin J.S. Rudwick, *The Great Devonian Controversy: The Shaping of Scientific Knowledge among Gentlemanly Specialists* (Chicago & London: The University of Chicago Press, 1985), 352–7.

[36] The article referred to is Thomas Joyce, "College life at Cambridge," *Westminster Review* 35 (1841): 456–81, signed 'N'. Joyce taught geology at University College London 1845–8, in an interregnum between professorial appointments; in an application letter he stated that his religious opinions made Cambridge graduation impossible. His referees were Ellis and Lonsdale (T. Joyce to C.C. Atkinson, 10 July 1845, College Correspondence, UCL Archives). A biffin was a dark red cooking apple, often served baked and flattened into a cake.

evenly poised […]. In short, he is an enthusiast, and for enthusiasm I have a feeling between pity and admiration' (15 August 1835). Later he commented on 'Mr Napier's extreme forbearance and kindness' (10 June 1839), and opined that 'in spite of his faults, he is a fine fellow' (28 April 1840). Napier had been very much struck by the fourteen-year old Ellis on their first encounter, exclaiming to his family, 'Such a proud, bright, clever, beautiful boy'; after this he made a point of meeting Ellis whenever he visited Bath.[37]

A rather different contact made via the Institution was with Sir Thomas Phillipps of Middle Hill at Broadway in Worcestershire. Phillipps was a self-confessed 'vellomaniac' who had assembled the largest private library in the world.[38] The manuscripts alone numbered over 60,000, the books over 50,000, and the library took up 16 of the 20 rooms in the house; in 1827 Phillipps had bought a nearby tower where he installed a printing press. Ellis spent several days at Middle Hill with his father, at Phillipps' invitation, in late September 1830; he did not join the adults' outings, but was allowed to browse and copy some of the manuscripts. The teenaged Ellis was already a scholar, who mixed with other scholars and for whom study was vital:

> Read two hundred & twenty lines of the Nubes with Mr Johnston – & Lacroix by myself. I find that study, & I do study a little, is of the greatest use to me – my life would be a blank or nearly so without it. I wish I could give myself wholly up to it, & sit reading, as I am now writing, by the flickering light of a solitary lamp, 'the world forgetting by the world forgot'. And if the vital spark were thus quenched before the time, so much perhaps the better, my euthanasia would be to die amongst my books, & quietly to give up the spirit which God has given to take again after a season.[39] (31 July 1834)

1.3 Ellis the Diarist

The phrase 'Gratis to Subscribers' treats the diary as a publicly available document; in other words, as a text that will have other readers than its author. This is a possibility that Ellis at times speculated about. Ellis's relationship to his diaries is an interesting topic in its own right. His entries begin by recounting the events of each day, but later on he gives opinions of people and books and engages in intellectual and emotional reflection (Fig. 1.2).

An early entry looks back over a considerable period: on 28 March 1828, Ellis listed ten achievements made since he had begun his diary about ten months earlier, beginning '1 I have done quadratics & cubes & begun logs.' The first five were mathematical, the last three classical, but the other two were neither: '6 I have learnt

[37] Bruce 1864, 2.460.

[38] For Phillipps, see Alan Bell. "Phillipps, Sir Thomas, baronet," *Oxford Dictionary of National Biography*, doi: https://doi.org/10.1093/ref:odnb/22143; Nicolas Barker, *Portrait of an Obsession: The Life of Sir Thomas Phillipps, the World's Greatest Book Collector* (London: Constable, 1974), adapted from Alan N.L. Munby. *Phillipps Studies*, 5 vols (Cambridge: Cambridge University Press, 1955–61).

[39] 'The Nubes' was Aristophanes' play *The Clouds*.

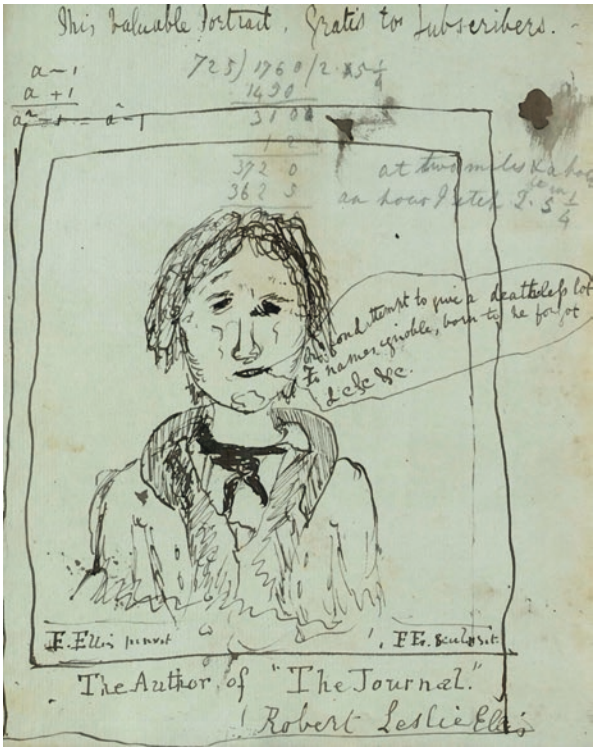

Fig. 1.2 Portrait of Ellis by his brother Frank, September 1831. ("Oh fond attempt to give a deathless lot/To man ignoble, born to be forgot &c &c".) (The opening lines of William Cowper's 'On observing some names of little note recorded in the Biographica Britannica'. Ellis was very fond of Cowper: 'Hackneyed at the oar'. What a fine expression. These are the peculiar merit of Cowper: these terse and significant expressions which I think not even Pope can rival. Indeed I wld draw the same distinction between Pope and Cowper in this respect as between Johnson's weight and Bacon's solidity' (23 June 1834) This comment is characteristic of Ellis in its ability to look beyond single instances to make interesting comparisons). TCL, Add.Ms.a.82/3. (Reproduced by kind permission of the Master and Fellows of Trinity College, Cambridge)

to ride in doing which / 7 My notions of Topography have been improved.' Ellis concluded: 'In doing all which, particularly the 1st and 6th & 7th, I have been exceedingly happy. White pony & Legendre. Sands & bath & esplanade, all all [*sic*] made me happy' (28 March 1828).[40] Later such reminiscences are usually much less happy, especially after the most profound blow Ellis suffered as a child, the death of his sister Mary Jane ('Mini') in August 1831. She was the closest of his siblings to him in age, and they often played and learned together. Later diaries are full of fatalism and gloom: 'All change is evil. Life is all change.' (28 January 1833). Along

[40] 'Legendre' probably refers to his long-lived elementary textbook *Eléments de géométrie* (1794); Ellis read the first book in September 1827 during a seaside holiday in Weymouth. The white pony and Legendre were cited by Grote, "Study," 9, who misquoted the original.

with this went a consciousness of time passing and a concern to compare past, present and future: 'names born to be forgot'. Ellis often went back to old diaries to note anniversaries, while wondering if he would still be alive in a year's time. This habit drew on the diaries as a retrospective database in which any current event could be compared with a record of the past, often several years back. Thus in writing to his friend John Grote in the early 1850s, Ellis remarked of a significant event 'It is five years ago this day'.[41]

During his undergraduate years at Trinity Ellis made some firm friends, in particular Richard Mate, Robert Jenkins, Tom Taylor and Alexander Gooden.[42] They visited each other's rooms frequently and often went walking together, a favourite Cambridge form of exercise. Ellis valued these friendships, but reacted very strongly if he thought they were not being kept up. In October 1840 he wrote in his diary,

> I had a letter of congratulations from Taylor dated Bishopwearmouth. I was tempted by it to reflect how much he has thrown away a very sincere regard I had for him. He was my first love at Cambridge & no man valued him more, or more willingly forgave his faults than I. Heartless I cannot think him; yet he throws a man aside like a sucked orange.[43] (10 October 1840)

The intensity of feeling revealed here ('my first love') is remarkable, and almost unparalleled in Ellis's diaries. This theme of abandonment also marked Ellis's relationship with his old tutor Hiram Johnston, whom he had liked and respected: in February 1841 he recorded a meeting with him:

> poor devil…his health broken down and ruined. He has not used me well… We were intimate for eleven years, far more than half my life at the time we parted. He gave me up with perfect facility […] (20 February 1841)

A popular method of predicting the future in the 1830s was phrenological examination, in which a practitioner felt the subject's skull with his hands and pronounced on his or her 'bumps'.[44] On 5 September 1839, Ellis wrote that

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[41] Ellis to Grote, c.1852: TCL, Mayor Papers, C12/38. The reference is probably to his mother's death in 1847; if so, the letter can be dated to 1852.

[42] His friends were remembered in Ellis's will, except those that predeceased him. They included E.M. Cope, who hurried to San Remo in 1849 when Ellis was attached by rheumatic fever, and H.A. J. Munro, who wrote a memoir of Cope: H.A.J. Munro. "Edward Meredith Cope," in Edward Meredith Cope and John Edwin Sandys, eds. *The Rhetoric of Aristotle* (Cambridge, 1877), xiii–xx.

[43] Ellis's undergraduate diaries show that he often met and talked with Taylor, who also features in the writings of Alexander Gooden and Charles Bristed. See Smith and Stray, *Gooden*; Christopher Stray, ed. *An American in Victorian Cambridge: Charles Astor Bristed's* Five years in an English University (Exeter: University of Exeter Press, 2008). Taylor became a fellow of Trinity in 1842; he was described as 'the life of his College, and at the head of the intellectual fun of Trinity' in Joux Sheehan, "*Our portrait gallery, second series no. 43: Tom Taylor*," Dublin University Magazine 90 (1877): 142–58, on p. 148. He was a prolific and successful playwright, and editor of *Punch* from 1872 till his death in 1880.

[44] See Roger Cooter, *The Cultural Meaning of Popular Science: Phrenology and the Organization of Consent in Nineteenth Century Britain* (Cambridge: Cambridge University Press, 1978).

> I […] let my head be handled by James De Ville for fortune telling. The character he gave me, is very vague – but in many parts correct. He noticed my kindness of disposition – my irritability, my want of energy & self reliance – my sense of honour & justice. In other matters he was more vague & less lucky. But the unkindest cut of all, was ascribing to me matrimonial propensities.[45]

It is easy to find disapproving references to mixed company in the diaries, though Ellis does at times acknowledge the good looks of particular women. Misogyny and appreciation of beauty combine in this entry:

> Mr Lyte & his daughter – a very fine girl certainly – only eighteen – looking two & twenty […]. She will have £30000 […]. So it would not be a very bad speculation. Yet any man who succeeded in it, would probably have a life time of repentance. (4 December 1840)

Two years before, however, he had enjoyed dancing with a Cambridge beauty:

> To Hopkins party. Had the honour and happiness of dancing with Miss Lorraine Skrine and two other stars of less magnitude. Apparently Mrs Hopkins provided her guests with partners, according to their University reputation – & so Miss Lorraine the great Cambridge belle was too good for Mate who went with me. After all one hears, I was surprised to find her a ladylike and an affectionate girl.[46] (30 November 1838)

One of Ellis's occasional shafts of humour acknowledges female beauty. When someone pointed out to him 'Miss Seppings, daughter of Sir Richard Seppings, the celebrated ship architect who invented the round stern. This tempted me to a mauvaise plaisanterie, which there is no occasion to record' (17 April 1834).[47] More common is a gentle verbal wit: Johnston is referred to as 'Jackspebble'; in a macaronic turn, Ellis writes that he 'scribed an epistolam'; and in an interlingual pun, remarks that 'Poeta nascitur non fit. I'm not fit to be a poet' (2 April 1832).[48]

1.4 Ellis at Cambridge

In June 1833, Ellis received a 'very civil' (9 June 1833) letter from the mathematician and Trinity College tutor George Peacock giving a long reading list and advising him to choose one of two private tutors for his final undergraduate year. Ellis immediately called on Henry Hayes, a retired clergyman who lived near the Ellises, and was informally examined in composition and the New Testament and given the

[45] The Swiss-born James De Ville (1777–1846) was the leading phrenologist in London.

[46] In his diary Ellis added a joke about the physics of dancing couples. Mary Loraine Skrine was the prettiest of four daughters of a local banker; in 1844 she married Robert Phelps, Master of Sidney Sussex College. Cf. Bury and Pickles, *Romilly's Cambridge Diaries*, 103.

[47] Seppings was the most celebrated naval architect of the day; he was surveyor to the Royal Navy 1813–32 and was knighted in 1819. His main reform was the introduction of triangular frames, but he also introduced round sterns and bows. Ellis's 'plaisanterie' presumably referred to Miss Seppings' stern.

[48] 'Jackspebble' is curiously similar to the nickname of Sir Richard Livingstone, president of Corpus Christi College, Oxford, 1933–50: 'Dicky Deadbricks'.

certificate needed for admission to the college.[49] On 10 July, Peacock wrote again to inform Ellis that he had officially been entered at Trinity.

Peacock recommended that Ellis go to a private tutor before entering Trinity, and Ellis went to James Challis, who had lost his Trinity fellowship on marriage in 1831 and took pupils at his rural living in Cambridgeshire; in 1835 he was elected Plumian Professor of Astronomy. Challis sent Ellis a long reading list of 40–50 volumes, mostly classical (6 August 1834), and on 24 October 1834 Ellis began his course of study at Challis's vicarage with two other pupils. On the following day Ellis found that 'His plan is to begin at the beginning – not altogether a bad one' (25 October 1834). This was the standard plan for college teaching, and necessitated by the ability range of undergraduates, but it meant that Ellis was often bored by the low level aimed at. After six weeks, he fell ill and went back home to Bath.

The prominence of classical reading in Challis's syllabus reflected the first-year curriculum at Trinity, where Ellis attended a classical and a mathematical lecture every weekday in term. The second year changed the emphasis, and the college examinations were largely mathematical. This sequence was designed to provide a transition from the public-school classical curriculum to the Mathematical Tripos examination taken in a student's eleventh term. Ellis, however, went up to Trinity already accomplished in both subjects. He kept up his classical reading for pleasure, but it also counted for something in the fellowship examination he sat in October 1840, which covered a wide range of subjects. The overlap in his classical and mathematical knowledge has already been mentioned; it recurred when he was involved with the *Cambridge Mathematical Journal*, which he supplied with Greek mottoes. Volume 1 bore an adage from Hesiod which translated as 'half a loaf is better than a whole one', perhaps alluding to the admission of short articles. The second and third volumes had mottoes from Plato's *Theaetetus*, an epistemological dialogue. The fourth volume was edited by Ellis after the death of the original editor, his friend Duncan Gregory; Ellis supplied an apposite motto from Homer about a Greek warrior taking command of a contingent in the Trojan War after its original leader was killed.[50] In 1846 William Thomson asked Ellis to supply more mottoes, and Ellis suggested quotations from Homer, Hesiod and Pindar.[51]

In February 1839 Ellis returned to Cambridge after an absence due to an attack of measles. He wrote in his diary:

> […] here I am again, with a little of that sickening feeling which comes over me from time to time, & which I can but ill describe, & with some degree of Manners[']s bitter dislike of

[49] Hayes had graduated as Seventh Wrangler in 1791. He was a Trinity M.A., and so was qualified to award a certificate.

[50] *Iliad* 2.703: *Oude men oud' hoi anarchoi esan, potheon ge men archon* [but his men were not leaderless, though they longed for their leader]. The Greek warrior Protesilaus of Phylace was killed in battle, but Podarces took over the command of his men.

[51] Robert Leslie Ellis to William Thomson, 20 and 26 October 1846. Both letters are included in the selection in Part II.

> Cambridge & of my own repugnance to the wrangler making process. There is but one place for me, & that I cannot obtain.[52] (8 February 1839)

For Ellis, then, the only escape from the intense competition in Cambridge mathematics was to come top: which he did. In January 1840 he sat the Mathematical Tripos and emerged triumphantly as Senior Wrangler, 300 marks ahead of his nearest rival Harvey Goodwin, who contributed a biographical memoir to the collection of Ellis's papers published after his death.[53] He was said to have 'beaten a paper', that is, to have produced answers superior to those worked out by the examiners, who accordingly awarded him more than full marks.[54]

In February 1840, fresh from his success in the Mathematical Tripos, Ellis took stock of his future prospects:

> I have been thinking a good deal about my plans – the present is a critical moment. There is no use to stay *thumin emon ketedwn* [eating my heart out] doing nothing at home. If I get my fellowship in September, a couple of months after I ought to begin law – but to it I feel increasing aversion. I begin to understand how men go into the church as a matter of convenience. If I did so, under the actual circumstances of the college – everything it can give lies before me. I should be a tutor before I should have got my first brief, on the other hypothesis. I think I could make a really good tutor, private & public, doubt if I could a lawyer, & I am sure it wd not suit me. Besides I look to being an old bachelor, so no place is better than Trinity. But there are weighty objections – positive and negative. (28 February 1840)

On the next day, depression overtook him, as so often:

> I have no intention of being idle. I could not bear to be so, yet I feel crushed & for the present at least, ambition is dead. I am sick of many griefs. Four or five years ago, I thought a senior wrangler would look to being either Lord chancellor or archbishop of Canterbury – now I feel like some sick brute who would fain leave the herd to go into a corner to die. (29 February 1840)

In the same year Ellis was elected to a Trinity fellowship, which he held till 1849; it lapsed because he was not ordained. His legal ambitions faded as he realised that he was not cut out to be a barrister. On the other hand, he retained a strong interest in the philosophy of law, and became very keen to succeed to the Regius Chair of Civil Law.[55] But when this became available in 1847 it went to Henry Sumner Maine, later famous for his work on status and contract.

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[52] 'Manners' probably refers to Lord John Manners, a Trinity undergraduate (matriculated in 1836) and later a romantic Conservative and Young Englander. He graduated in 1839 as a nobleman with an MA degree without examination. See Denis Arthur Winstanley, *Unreformed Cambridge* (Cambridge: Cambridge University Press, 1935), 79–83.

[53] See William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co., 1863).

[54] Stray, *Bristed*, 219 n.36.The Senior Classic of the same year, Alexander Gooden, had been given 100 marks over the maximum for an Aristotle paper in a college examination (8 June 1839).

[55] 'It has been a dream of mine for some years' (Ellis to his sister Fanny, 7 February 1847, TCL, Add.MS.a.81/73).

1.5 Conclusion

Ellis's diaries give us a richly detailed insight into his education. He was fortunate in his family situation and in his teachers. Francis Ellis was able to afford regular tutoring for his youngest child, and it is clear that Robert was treated differently from his siblings. His sisters had tutors for 'accomplishments', the knowledge needed for girls to move comfortably in society and with luck to attract husbands; his eldest brother Henry went into the army, while Frank went to Rugby, to Cambridge, then into the army without graduating. Robert was precociously intellectually talented, and his father responded by hiring tutors for him early on. We do not know why he did not send him to a public school, but private tutoring was not uncommon in families who could afford it. Of the intake in Ellis's year at Trinity, 1836, information on previous schooling survives only for about a third of his coevals. Of these, about two thirds had been to public schools and a third to private schools or tutors; in the case where no information is given in the Trinity College admissions register, it is perhaps more likely that they were tutored.

Robert Ellis learned from a variety of sources. Both his tutors were clearly informed and competent, but he also had access to his father's library and to that of the Bath Institution, and also to conversation with educated men there who treated him as an intellectual equal. The Institution also put on a series of public lectures that Ellis attended, as we can see from the sometimes scathing comments in his diaries. Most of these lectures were on scientific topics, as was common in the period, and as we have seen, Francis Ellis's first hiring was of a mathematical tutor. It may be that he at first thought of schooling his son in Classics himself, before deciding to hire a separate classical tutor. Hiram Johnston's visits to the Ellis household took place almost daily, unlike those of Thomas Davies; the difference may simply reflect the teaching practices of the two men, since the cost of hiring them is unlikely to have a significant factor in Francis Ellis's planning.

As we have seen, Ellis's lessons followed a pattern that anticipated what he found at Trinity, with parallel teaching in Classics and mathematics. Many wealthy families will have provided classical tutoring for sons, but mathematics was less commonly taught, and it may be that Francis's known interests in science encouraged him to provide both. The first- year curriculum at Trinity was weighted toward Classics, reflecting the previous experience of most freshmen; it was in the second year that mathematics dominated. This explains the otherwise surprising fact that most of the reading list sent to Ellis by his private tutor, the mathematician James Challis, was classical rather than mathematical. When Ellis was in his final year as an undergraduate, he clearly spent most of his time on mathematics, but occasional references show that he kept up his classical reading. Had he decided to go on to the Classical Tripos in 1840 after graduating as Senior Wrangler, he would probably have been in the first class. There was however no incentive for him to subject himself to yet another trial of intellectual strength, and there is no suggestion in his

diaries that he considered doing so. Classical knowledge, whether of textual minutiae in the Cambridge style or of the broader historical questions discussed at Oxford and which he enjoyed so much finding in the work of Arnold Heeren – all these were part of the cultural capital of an educated gentleman. Mathematics provided higher and more intellectual challenges. Yet Ellis retained an interest in a wide range of subjects, as can be seen from the writings reprinted in Walton's posthumous collection. It is that which justifies his posthumous reputation as not just a mathematician, but also a polymath.[56]

[56] My thanks for help with this chapter to June Barrow-Green, Tony Crilly, John Gibbins, Chris Pelling, Jonathan Smith and Lukas Verburgt.

Chapter 2
"A Senior Wrangler Among Senior Wranglers": The Mathematical Education of Robert Leslie Ellis

June Barrow-Green

2.1 Introduction

Beginning in the spring of 1825 Ellis was tutored in mathematics at home by the up-and-coming Thomas Stephens Davies (Fig. 2.1). After Davies's departure from Bath in 1834 for the Royal Military Academy in Woolwich, Ellis prepared himself for Cambridge without a tutor, apart from a very brief sojourn as a pupil of James Challis. He went up to Cambridge in October 1836, graduating in the coveted position of senior wrangler in January 1840, with four publications already to his name.[1]

Using Ellis's private journals as a guide, I shall follow Ellis on his mathematical journey from his home in Bath to his triumph at Cambridge. The journals provide a remarkable record of his mathematical education from young boy to mature student. Full of information about the mathematics he was studying—the texts he was reading and the mathematical problems he was trying to solve—as well as his hopes and fears for his own mathematical progress, especially while at Cambridge, they provide a unique insight into the development of one of England's most gifted mathematicians of the nineteenth century.

When at home in Bath, Ellis had access to a wide range of mathematical texts, many only recently published. Apart from his father's library, there was the excellent library of the Bath Literary and Scientific Institution (BLSI) to which he was a

[1] Wranglers were students who obtained first-class honours in the Mathematical Tripos. They were listed in order of merit with the senior wrangler (SW) being the top student of the year. Henceforth, wranglers will be denoted (XW) where X stands for position, i.e. second wrangler will be denoted (2W).

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L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0_2

Fig. 2.1 Portrait of Thomas Stephens Davies. (Source: *The Expositor* 1 (1851), 284)

frequent visitor.[2] He also borrowed books from Davies. It likely that Ellis's earliest mathematical tuition came from his father, Francis Ellis, who himself had a reputation in Bath as a competent mathematician, and who, on recognising his son's talents, engaged Davies as a tutor.[3]

2.2 Thomas Stephens Davies (c.1794–1851)

Davies first appeared in the Ellis household sometime in the spring of 1825 when Ellis was aged only seven,[4] presumably employed on the strength of a personal recommendation. There is no evidence that Davies ever had a fixed position while in Bath; his living seems to have been made solely through tutoring. Certainly by 1830 he was describing himself as a private teacher of mathematics.[5] As well as tutoring Ellis, Davies occasionally gave tuition to Ellis's older brother Francis (known as Frank). The earliest reference to Davies in Ellis's journal occurs on 28 May 1827, the day after Ellis began his first journal, where he mentions spending an hour and a quarter with Davies.

[2] For Ellis's early intellectual life, see Stray's chapter in the present volume.

[3] On general aspects of Ellis's home education, see Stray's chapter in the present volume.

[4] On 30 June 1834, Ellis noted in his journal that Davies had been teaching him for more than nine years.

[5] On 25 May 1830, when he was elected to the Astronomical Society of London (from 1831 the Royal Astronomical Society), Davies, underneath his signature, described himself as a private teacher of mathematics. He also advertised for pupils: *The Bath Chronical and Weekly Gazette* for 30 December 1830 carried a prominently placed advertisement for Davies as a mathematical tutor, especially for 'those intended for the Universities, and the Royal Military and Naval Colleges'.

Little is known about Davies's early life. His birthdate is given variously as 1794 and 1795, and it is possible that he came from Wales.[6] By his own admission, he had 'not a single hour's of *mathematical* [Davies's emphasis] instruction' and considered himself an 'non-academic' man, but that is all he disclosed about his (lack of) education.[7] His earliest mathematical publications show he was in Sheffield by July 1817 and in Leeds shortly thereafter.[8] He was certainly in Bath by the autumn of 1824 and remained there until 1834.[9] Why he made the move to Bath is unknown but it may be connected to the presence of William Trail who had retired there in c.1821, having been professor of mathematics at Marischal College in Aberdeen (1766–1779) before moving to Ireland for a career in the church. The anonymous writer of a posthumous appreciation of Davies remarked on Davies's 'early intimacy' with Trail.[10] Trail was the author of the popular *Elements of Algebra for the Use of Students in Universities* (1770), and a biography of the eighteenth century Scottish geometer Robert Simson. Davies was known for his love of classical geometry and this may well have been stimulated by Simson's edition of Euclid's *Elements,* together with Simson's other writings, the study of which would have been encouraged by Trail.[11]

Once in Bath Davies immersed himself in the intellectual life of the city, becoming an active member of the BLSI of which Francis Ellis was one of the founders. By the early 1830s he was involved in the organisation of the BSLI's monthly lectures and gave lectures there himself,[12] having gained a scientific reputation cemented by election to national societies. The latter included the Astronomical

[6] The grounds for thinking Davies may have come from Wales are that his surname is of Welsh origin and Ellis, punning on Davies's open dislike of Cambridge, saying that he thought Davies preferred 'Cambrian mathematics' to Cambridge (10 June 1833). Davies's antipathy towards Cambridge would be dispelled after his visit there for the British Association for the Advancement of Science meeting later in 1833 (see below).

[7] Thomas S. Davies. "University and non-university mathematicians," *Mechanics' Magazine* 46 (1847), 428–431, on p. 429.

[8] Thomas S. Davies, "Answers to the mathematical questions," *The Leeds Correspondent* 2 (1817): 265–292; Thomas T. Wilkinson, "Memoir of the literary labours of the late Professor Davies, F.R.S., F.R.A.S., &c.," *The Civil Engineer and Architect's Journal* 14 (1851), 77–78, on p. 77.

[9] Thomas S. Davies, "Practical geometry," *Mechanics' Magazine* 3 (1825), 70–75, on p. 75.

[10] Anon., "English mathematical literature," *The Westminster and Foreign Quarterly Review* 55 (1851), 70–83, on p. 73.

[11] Simson's edition of Euclid, which was first published in Latin in 1756 and later in English, appeared in many editions well into the nineteenth century.

[12] Joseph Hunter in his history of the BLSI describes Davies as being one of the stalwarts of the Association of the BLSI (the department of the BLSI responsible for public lectures). Joseph Hunter, *The Connection of Bath with the Literature and Science of England* (Bath & London, 1853), 19. Davies certainly gave lectures on 'The Authority of Common Sense in Philosophical Inquiries' (18 April 1831) and on 'Comets' (17 April 1832) since these were reported in the *The Bath Chronicle and Weekly Gazette* for 21 April 1831 and 19 April 1832, respectively, where he is referred to as 'the Secretary'. On his election to the Royal Society of London, the same newspaper described him as 'our learned townsman' (25 April 1833).

Society of London in 1830, for which he was proposed by Francis Ellis,[13] the Royal Society of Edinburgh in 1831, and the Royal Society of London in 1833.[14] He attended the second and third British Association for the Advancement of Science meetings which were held in Oxford (1832) and Cambridge (1833), although he did not make any formal contributions. Rather to his surprise, the meeting in Cambridge turned out to be more pleasant than he had anticipated.[15] Contrary to his expectations, he found Peacock 'delightful', Airy 'modest and retiring', and was even 'satisfied' with Whewell.[16]

Alongside his tutoring, Davies continued his geometrical research, publishing in several periodicals including the *Philosophical Magazine*, the *Ladies' Diary*, the *Gentleman's Diary* and *Leybourn's Repository*.[17] His contributions included answers to mathematical questions as well as articles, usually on an aspect of classical geometry in which he displayed both mathematical expertise and a wide range of historical knowledge. Typical of his publications from this period are 'Properties of the trapezium' and the related 'Properties of Pascal's hexagramme mystique' which appeared in the *Philosophical Magazine* in 1826.[18] Rather more substantial are his publications in the *Transactions of the Royal Society of Edinburgh* (*TRSE*), such as those on sundials and on spherical geometry.[19]

One of Davies's friends while he was in Bath was the Rev. Henry F.C. Logan, professor of mathematics at the Catholic College of Prior Park, with whom he collaborated on problems of spherical geometry.[20] There were plans for a joint

[13] Francis Ellis was elected to the Astronomical Society of London in 1828. He was proposed for election by Francis Bailey, immediate past President of the Society, who was one of the leading figures of his day in English astronomy.

[14] Among Davies's signatories for his election to the Royal Society was Dr. William Somerville, husband of Mary Somerville with whom Davies corresponded from 28 June 1832 to 4 February 1837. Bodleian Library Special Collections, Dep.c.370.MSD-1.2. I am grateful to Brigitte Stenhouse for sharing transcriptions of this correspondence with me.

[15] On 8 April 1833, Ellis noted in his journal 'Read Whewell with Mr. Davies—whose jealousy of Airey [sic] is very curious. There is a morbid love of "fame" the ignis fatuus of "noble minds" about him, which joined with gall & bitterness against an exclusive body makes him always depreciate what is done at Cambridge'.

[16] These are direct quotes from Davies which Ellis transcribed into his journal (1 July 1833). Davies was one of five hundred invited to the great dinner at Trinity College.

[17] Davies was on first-hand terms with Thomas Leybourn, the editor of *Leybourn's Repository*, meeting him when he visited Bath in the summer of 1830 (23 June 1830).

[18] Thomas S. Davies. "Properties of the trapezium," *Philosophical Magazine* 68 (1826): 116–125; Thomas S. Davies. "Properties of Pascal's hexagramme mystique," *Philosophical Magazine* 68 (1826): 333–339.

[19] Thomas S. Davies, "An inquiry into the geometrical character of the Hour-Lines upon the antique Sun-Dials," *Transactions of the Royal Society of Edinburgh* 12 (1834): 77–122; Thomas S. Davies. "On the equations of Loci traced upon the surface of a Sphere, as expressed by spherical-coordinates," *Transactions of the Royal Society of Edinburgh* 12 (1834): 259–362, 379–428.

[20] John R. Young, *Elements of Plane and Spherical Trigonometry, with its application to the principles of Navigation and Nautical Astronomy. With the Logarithmic and Trigonometrical Tables. To which is added some original Researches in Spherical Geometry, by T.S. Davies* (London,

publication but in the summer of 1834 they had a falling-out. This was recorded by Ellis in his journal (27 June 1834), although the exact circumstances of the disagreement are hard to fathom. Ellis himself got on very well with Logan and their friendship endured to the end of Ellis's life.[21]

In the summer of 1834 Davies departed from Bath to take up a post as a mathematical master at the Royal Military Academy at Woolwich where he remained until his death in 1851.[22] While at Woolwich he published extensively in an increasing variety of journals[23] securing his reputation as a geometer.[24] Most of his work was concerned with solving problems arising from classical Greek geometry; one of the exceptions being his geometrical investigations on magnetism about which he corresponded with Mary Somerville.[25] He is best remembered for his *Solutions of the Principal Questions of Dr Hutton's Course in Mathematics* (1840), and his subsequent masterful editing of the 12th edition of Hutton's two volume *Course* (1841–1843).[26] Less well known is his lecture 'On the Velocipede' which he

1833), 144. For biographical details about Logan, see Lukas M. Verburgt, "Robert Leslie Ellis, William Whewell and Kant: the role of Rev. H F C Logan," *BSHM Bulletin* 31 (2016): 47–51.

[21] Sophia De Morgan, *Memoir of Augustus De Morgan* (London: Longmans, Green & Co., 1882), 103.

[22] The education at the Royal Military Academy had a strong emphasis on mathematics and many notable mathematicians were employed there during the nineteenth-century, including, among others, Olinthus Gregory, James Joseph Sylvester and George Greenhill.

[23] Davies provided an explanation for the 'scattering' of his writings in his article "University and non-university mathematicians," *Mechanics' Magazine* 46 (1847): 428–431.

[24] The obituaries of Davies are fulsome in their praise of him as a geometer, describing him as 'a geometer of surpassing excellence' (Jo. Cockle, Ja. Cockle "The late Professor Davies," *Mechanics' Magazine* 55 (1851): 432–433, on p. 432) and 'the first of British geometers' (Anon. "English mathematical literature", 83). However, much of Davies's work was concerned with solving problems arising from classical Greek geometry and he was not responsible for any major discoveries. That said, he was familiar with the recent work of Continental mathematicians, such as the projective geometry of Poncelet, and his work was known on the Continent. When the French mathematician, Michel Chasles (1793–1880), one of the leading geometers in France, visited England, he made a point of visiting Davies and presented him with a copy of his renowned *Aperçu historique sur l'origine et le développement des méthodes en géométrie* (1837) (Cockle & Cockle, "The late Professor Davies," 432). A detailed description of Davies's publications is given in Anon., "English mathematical literature".

[25] Thomas S. Davies, "Geometrical investigations concerning the phenomena of terrestrial magnetism," *Philosophical Transactions of the Royal Society* 125 (1835): 221–248; Thomas S. Davies, "Geometrical investigations concerning the phenomena of terrestrial magnetism. Second series: – On the number of points at which a magnetic needle can take a position vertical to the Earth's surface," *Philosophical Transactions of the Royal Society* 126 (1836): 75–106. Thomas Stephens Davies correspondence with Mary Somerville, Bodleian Library Special Collections, Dep.c.370. MSD-1.2.

[26] Charles Hutton was professor of mathematics at the Royal Military Academy, Woolwich (1773–1807). His popular *Course of Mathematics* was first published in 1798. Davies, in his preface to the second volume, announced that 'there is not a single line of the original work which has not been recomposed'. Charles Hutton, *Course of Mathematics*. Vol. 2. (London: Longman & Co., 1843), iii.

delivered in Oxford in May 1837, a manuscript copy of which survives at Trinity College, Oxford.

Ellis received tutoring from Davies three or four times a week, with Davies's visits often lasting well over an hour. On the days when Davies was not present, Ellis often worked at mathematics by himself, sometimes on problems Davies had set him to solve and sometimes pursuing his own interests. (This contrasted with his tutoring in classics which took place daily during the week.)

In the early years, Davies and Ellis got on well together, with Ellis keen to ensure he was properly prepared for his next lesson. But as time wore on, Ellis became less tolerant of Davies with his unreliable timekeeping and lack of preparation.[27] Ellis would also run into Davies at the BLSI and although Ellis had broad interests for someone of his age, he had little patience for discussions with Davies on anything other than mathematics; talk of 'mimosa & geraniums' had Ellis wishing Davies 'at the Antipodes'! (23 [22] April 1829). On the personal side, Ellis considered Davies rather boorish with social pretentions.[28] And he had little time for Davies's wife. He considered her quite unfit for the role and wished he could get Davies a divorce! (8 July 1834).

Whether Davies and Ellis saw each other again after Davies left Bath is unknown but they remained in contact.[29]

2.3 Ellis's Mathematical Development (1827–1834)

Ellis's aptitude for mathematics showed itself very early. Not many children aged nine would have welcomed their father giving them a copy of Legendre's *Elements of Geometry*, a book generally considered appropriate for students in higher education (20 June 1827).[30] Ellis relished it. He worked through it with Davies and on his

[27] On the 24 December 1831, when Davies neither appeared nor sent a message, Ellis described him as 'the most disagreeable creature extant'.

[28] In connection with a visit to Bath of the mathematician Thomas Leybourn, Ellis reported that a friend at the BLSI had told him that Leybourn was 'more boorish' than Davies and had 'even greater pretention to being a gentleman' (7 June 1833).

[29] In a paper published in 1844, Davies described Ellis as his 'old friend and former pupil' referring both to a paper of Ellis's of 1841 and to correspondence with Ellis. The mathematics in question concerned the well-known geometrical theorems and porisms of Matthew Stewart, professor of mathematics in Edinburgh (1747–1785), which had been published in 1746. Thomas S. Davies, "An analytical discussion of Dr. Matthew Stewart's general theorems," *Transactions of the Royal Society of Edinburgh* 15 (1844): 573–608, on p. 605. Robert Leslie Ellis, "Analytical demonstrations of Dr. Matthew Stewart's Theorems," *Cambridge Mathematical Journal* 2 (1841): 271–276. Reprinted in William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co., 1863), 12–37.

[30] Legendre's *Elements of Geometry and Trigonometry* (1794), which was a reworking and extension of Euclid's *Elements* into a more accessible form, was 'highly esteemed in every part of Europe'. Adrien-Marie Legendre, *Elements of Geometry and Trigonometry* (Edinburgh, 1822), v. It was translated into English in 1822 by Thomas Carlyle with editorial input from David Brewster,

own, at times challenging himself to prove propositions before looking at the given proof. He even took it with him on holiday in Weymouth. Within three months, he had completed the first 'book' (chapter) which concludes with the proof that the two diagonals of a parallelogram divide each other into equal parts. Six months later, he had completed the next three books and much more besides, as he revealed in his journal when he listed his achievements of the previous ten months, the period during which he had been writing his first journal. The five at the top of his list (of ten) were mathematical, all of which had made him 'exceedingly happy' (28 March 1828)[31]:

1. I have done quadratics & cubes & begun 2 logs.
2. I have begun Geometry to 4 books of first Legendre.
3. I have begun to learn Trigonometry.
4. I have begun to understand Analysis
5. In doing Analytical Conic Sections.

He soon moved on to other branches of mathematics, with a variety of textbooks aiding his study. Several were authored by Cambridge graduates and written either for preparation for Cambridge or for use by undergraduates. These included books on conic sections by James Hustler (1820) and Samuel Vince (1817), analytical geometry by Henry Parr Hamilton (1826),[32] mechanics by Bewick Bridge (1813–1814), algebra by John Young (1823) and John Ross (1827), and for logarithms and mathematical tables he was guided by Charles Hutton (1795). Of these, he was particularly taken with Bridge's *Mechanics*, extolling both Bridge's treatment of the subject and the layout of the book.[33] Never before had he understood 'why a projectile would (but for the atmosphere) describe a parabola' but now he understood it 'perfectly' (29 March 1829). As well as working from English textbooks, he also referred to classic texts such as La Hire's *La Lieux Géométriques* (1679), his tuition in French making such texts accessible.[34]

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and by the time the English translation had gone to press the 12th French edition was in preparation. Ellis's father maintained a continuing interest in his son's mathematical activities. See, for example, Ellis's journal entry for 19 December 1830 concerning the drawing of an ellipse.

[31] Two years later, on 29 May 1830, he reflected on this entry, 'This is the third anniversary of writing my journal. It was a pretty composition, but my first anniversary was much more grand, 'O white poney [sic] and cliffs, O Legendre'. I never read it without appending to it, "O ass, why didst thou write such stuff?"'. For full journal entry for 29 May 1830, see Stray's chapter in the present volume.

[32] Hamilton's was the first analytical geometry book in English to include geometry in three dimensions. See Alex D.D. Craik, "Henry Parr Hamilton (1794–1880) and analytical geometry at Cambridge", *BSHM Bulletin: Journal of the British Society for the History of Mathematics* 35 (2020): 162–170.

[33] Ellis very much liked the fact that the diagrams were on the same page as the subject they illustrated; many textbooks of the period put diagrams together at the back of the book since this was easier and cheaper to print.

[34] Ellis had tutors for both French and German. See Stray's chapter in the present volume.

Typical of his journal entries at this period is one made in February 1829 when he recorded a meeting with Davies:

> The first problem I attempted [in Ross (1827)], which is the 16th of the "Problems for equations of the higher degrees" turned out to be a bi-quadratic. We left it therefore, until I shall have learnt the rule & the rationale of equations of the 4th degrees, & proceeded to the next. But from an ambiguity in the enunciation of the problem we made a mistake in the sense of the author, when we perceived it was too late. (27 February 1829)

The book by Ross is an 1827 translation of a popular German algebra text of 1808 by Meier Hirsch,[35] but the examples that go with the text, which Hirsch published in 1811, had been translated earlier by John Wright.[36] It is probable that the two translations had been bound together. The problem referred to by Ellis is the following[37]:

> Four persons, A, B, C, D, have each of them a certain number of pounds in their possession, B 1*l.* more than A, C 1*l.* more than B, and D 1*l.* more than C. If we multiply the four sums by one another, and consider the product as so many pounds, we shall obtain 1168 *l.* more than we should by cubing D's. How much has each?
>
> Ans. A 5*l.*, B 6*l.*, C 7*l.*, D 8*l.*

As Ellis noted, the answer requires the solution of a quartic equation—no mean feat for an eleven-year old!

By the middle of March 1830, Ellis had begun studying differential calculus using Dionysius Lardner's *Elementary Treatise* (1825). He made rapid progress. Within six weeks he was on to Taylor's theorem and by the end of May had begun integration. He subsequently moved on to the generation of curves using the first volume of Jephson's *Fluxional Calculus* (1826–1830). In the meantime, Davies had also brought him Wright's *Solutions of the Cambridge Problems from 1800 to 1820* (1825), a sure sign that preparation for Cambridge was in hand; and a few weeks later Ellis began a mathematical memoranda book for recording mathematical problems. By the middle of July, he was immersed in Young's text on the theory of equations which appeared to him the more beautiful the more he saw of it. Nor was he confined to mastering a single subject at a time: one day he was studying mechanics,

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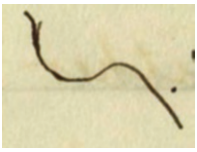
[35] Meier Hirsch (1765–1851) was a private teacher whose textbooks were very popular in Germany. His attempts to find a general solution to polynomial equations led to mental illness from which he never recovered. Moritz Cantor in his biographical article on Hirsch wrote 'we must not put Hirsch in the same category as writers who think that they have found squaring of the circle, the perpetual motion machine and such like in our century. Hirsch lost mind over his task: those others had no mind to lose', in *Allgemeine Deutsche Biographie* 12 (1880) 467–468, on p. 468. I am grateful to Reinhard Siegmund-Schultze for alerting me to this quote.

[36] Wright had studied at Cambridge and, although he was destined for a high position in the Tripos in 1819, an unlucky set of circumstances meant he was awarded only a pass degree. He published several textbooks designed for Cambridge preparation as well as a detailed account of his undergraduate experience. J.M.F. Wright. *Alma Mater; or Seven Years at the University of Cambridge* (London, 1827). For further details about Wright, see Andrew Warwick, *Masters of Theory: Cambridge and the Rise of Mathematical Physics* (Chicago & London: The University of Chicago Press, 2003), 69–72.

[37] J.M.F. Wright. *Self-Examinations in Algebra* (London, 1825), 243.

the next he was proving propositions from Euclid. Davies also asked him to translate texts from the French, such as Lazare Carnot’s *Géométrie de Position* (1803).

The last months of 1830 saw a flurry of mathematical activity—he had read Cotes’ introduction to Newton’s *Principia*, was doing a lot of curve sketching and calculus—and Davies was pleased with his progress. 8 December was a typically active day mathematically:

> Attempted to find the value of x & y when tan makes 45^o with XX’ for the curve $ax^4 - a^3y^2 = y'x$ – but as y^3 comes in, it is irreducible. … Mr Davies and I found the tangents &c of a curve who [sic] equa. I forget but whose shape is
>
> 
>
> & proceeded through two more cases of integration. (8 December 1830)

Sometimes he put his mathematical knowledge to practical use, such as on the day when he drew a specific ellipse ‘to serve as a model for the glass [mirror] to be put up over the sideboard in the dining room’ (7 [8] March 1831). Nor was his mathematics always serious. On a couple of days he was occupied by the weight of eggs:

> I was very idly busy in calculating the weight of eggs till breakfast. My datum was the thing Mr P.B. Duncan[38] told me two years ago, that 270,000 eggs weighed 20 tun [sic]. This gives 602669642837 + eggs to the averdupois [sic, avoirdupois] pound, or 49618+ to the troy pound. (13 March 1831)
>
> I finished my calculation about the eggs by finding that the average weight of a hen’s egg is 2^{oz} 8^{dwt} 16^{gr} 7 Troy weight. (16 March 1831)

while on another he did a statistical analysis of the family cats:

> Having measured Tom & Dicky I find this table
>
> | | Tom | Dicky |
> |---|---|---|
> | Nose [toins?] | 23^{in} | $18^{1/2}$ |
> | Tail | 10^{in} | 12^{in} |
> | Stands | 10^{in} | 12^{in} |
> | Round.beh. Shoul. | 17^{in} | $15^{in}½$ |
>
> Thus we see that Tom’s carcase [sic] is bigger than Dicky’s but that Dickey [sic] has the advantage in tail and legs. Qu[estion] are not a cat’s tail & stature always nearly equal to each other? The height of the latter being if anything rather less than the length of the tail. Mem measure all the cats you can catch. (29 March 1832)

Early in 1832, at the age of fourteen, Ellis made his first submission to a periodical. Prompted by an ‘unintelligible’ article by a certain Captain Alfred Burton in the

[38] Nothing further is known about P.B. Duncan.

United Service Journal on the classical problem of angle trisection,[39] he sent in a response which his father helped him finesse (8–11 February 1832). Burton's article had been a response to the translation of a purported proof by a Major in the Austrian army which the *Journal* had carried a few months before. History abounds with misguided angle trisectors, and predictably these two articles drew several critical responses of which the *Journal* published only a selection. Some of these appeared under pseudonyms but Ellis's was not among them.[40] Ellis himself expressed dissatisfaction with his paper, at one point wishing it to be 'at the bottom of the Red Sea', probably because he was fed up with the subject rather than because his mathematics was flawed. A couple of years later he returned to the subject reading a French tract[41] which he dismissed rather pithily, showing his ability to criticise others and a maturity in his mathematical reading:

> Azemar is evidently no mathematician & Garnier's part is not masterly. The slightest performance of Euler or McLaurin has a finish, an elegance which inferior men never reach. (30 March 1834)

Even if Ellis had felt relieved that his first attempt at publication was unsuccessful, he would surely not have been pleased to discover that a translation of an article he had made for Davies had been published under Davies's name. In 1835 an article by Davies on spherical trigonometry appeared in *Leybourn's Mathematical Repository*. It was dated 25 October 1832 and contained a result which had appeared in Latin in 1825 in an article by the German mathematician Carl Jacobi, and Davies had promised to produce a translation of this article for a future issue.[42] Three weeks later, Ellis reported in his journal that Davies had asked him to translate Jacobi's article, a request to which he had acceded with reluctance and later regretted (12 November 1832, 3–4 February 1833, 12 May 1833). Presumably Davies had found the translation more difficult than he had anticipated. When the translation—which took Ellis

[39] Trisecting the angle is one of the three classical problems of Greek antiquity, the other two being duplicating the cube and squaring the circle. In each case a construction using only a straight edge and compasses was desired and many mathematicians provided many false proofs, with angle trisection being a particular favourite. In 1837 Pierre Wantzel proved the impossibility of trisecting the angle and duplicating the cube, see Jesper Lützen, "Why was Wantzel overlooked for a century? The changing importance of an impossibility result," *Historia Mathematica* 36 (2009): 374–394. Almost fifty years later, in 1882, Ferdinand Lindemann proved that the number π is transcendental and thereby proved that squaring the circle is impossible. See Alfred Burton, "Angle trisection," *United Service Journal* 1831 (Part 2): 406–408; 1831 (Part 3): 392–394.

[40] Of 'the numerous demonstrations' on angle trisection received by the *United Service Journal*, only 'the most concise' were published, and none of the authors were identified by name. These short articles appeared in the issue for 1832 (Part 1), 398–400. The same issue carried a longer article on the subject which also came in for criticism: Major W. Mitchell, "On the trisection of an angle, and the mathematical principles of field movements," *United Service Journal* 1832 (Part 1): 106–109.

[41] L.P.V.M. Azemar, *Trisection de l'angle, par L.P.V.M. Azemar, suivie de recherches analytiques sur le même sujet, par J.G. Garnier* (Paris, 1809).

[42] Thomas S. Davies, "New researches in spherical trigonometry," *Leybourn's Mathematical Repository* 6, Part 2 (1835): 168–188, on p. 172.

several months to complete and ran to 30 pages—was eventually published, it appeared as if produced by Davies with no mention of Ellis.[43] By this time Davies was safely in Woolwich!

Given Davies's own interests, it is not surprising to find that much of Ellis's time with Davies was spent studying geometry. Euclid's *Elements* was a constant of young men's education in the nineteenth century, and Ellis was no exception. But the *Elements* was not a text Ellis universally relished. In the summer of 1832, he was very relieved to have finished the first two Books (which deal with the properties of plane figures made from straight lines) after four years of acquaintance. He was much happier once he had moved on to Book 3 and the theory of circles. He then began the study of solid, i.e. three-dimensional, geometry, beginning with the treatise of Hymers (1830) rather than with Euclid, before progressing to Monge's *Géométrie descriptive* (1799) in which methods are developed for representing three-dimensional objects in two dimensions. It was not a subject he took to, finding it 'very difficult to conceive' and hard to remember (17 October 1833). Davies had made models to go with Monge's text and although Ellis tried his hand at constructing some of his own, he met with little success. He could see the value in constructing them but felt that 'mechanical matters', as he described them, were not one of his strengths (21 October 1833), although he had had more success a few months earlier when he had made a model of bees' cells (24 March 1833).[44] Other geometrical topics he studied with Davies included porisms—a particular favourite of Davies's—and Legendre on the theory of parallels.

Alongside mathematics, Ellis was exposed to some physics, both with Davies—they studied Whewell's *Dynamics* and *Mechanics* together—and at the BLSI where he witnessed experiments, such as those on hydrostatics by the peripatetic lecturer Robert Addams.[45] He also did various physics experiments himself, sometimes with the help of his father who himself enjoyed experimenting.[46] Initially Ellis struggled with the number of different notions involved (time, space, force, moving force, etc.) but once he could use the calculus he found it much easier. During a trip to London in the summer of 1832 he visited mathematical instrument makers and the newly opened *National Gallery of Practical Science*. At the latter he 'saw a spark from the magnet' which he presciently considered to be 'the most important

[43] Carl G.J. Jacobi, "On certain properties of plane triangles which are not generally known." *Leybourn's Mathematical Repository* 6, Part 3 (1835): 68–96.

[44] Ellis's model of bees' cells had been prompted by reading Daniel Cresswell's *Elementary Treatise on the Geometrical and Algebraical Investigation of Maxima and Minima* (1817), 273–298. Ellis returned to the study of bees' cells later in life and a manuscript, 'On the form of bees' cells', which can be dated to sometime during or after 1843, was published posthumously in William Walton, ed. *The Mathematical and other writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co., 1863), 353–357.

[45] For information about Addams, see Nicholas J. Wade, "Pursuing paradoxes posed by the waterfall illusion," *Perception* 47 (2018): 689–693, on p. 691.

[46] For an account of an auditory sensation experienced by Francis Ellis while bathing in a large warm bath, see Francis Ellis, "On the propagation of sound through unelastic fluids," *The Journal of Natural Philosophy, Chemistry and the Arts* 25 (1810): 188.

perhaps of any electrical discovery since the days of Franklin' (16 July 1832).[47] What he had seen was an example of Faraday's famous magnetic spark apparatus which the previous year had caused a great stir at the Royal Institution and which lay at the foundation of Faraday's ground-breaking work on electromagnetic induction.[48] On the same trip, he read Babbage's newly published book on manufacturing from which he learnt about Babbage's difference engine,[49] a small working model of which Babbage had produced earlier that year.

Much of the final year of Ellis's tuition with Davies, from the summer of 1833 to the summer of 1834, was taken up with preparation for Cambridge in the form of past examination papers—even though Ellis's planned departure for Cambridge was not until the autumn of 1835—and, especially, the study of Peacock's *Algebra* (1830). The latter was the first of Peacock's contributions to the reform of algebra in Britain.[50] It was particularly notable for Peacock's idea to distinguish between arithmetical and symbolical algebra, the distinction which led to his celebrated 'principle of the permanency of equivalent forms' (Fig. 2.2), as well as for his effort

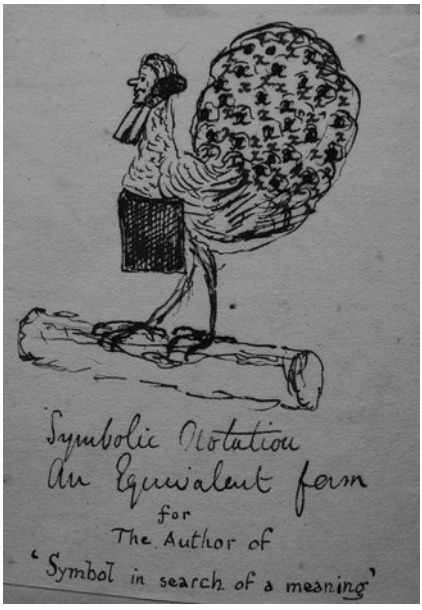


Fig. 2.2 Drawing of George Peacock by Augustus De Morgan. "Symbolic Notation. An Equivalent Form for the Author of 'Symbol in Search of a Meaning'". (Reproduced by kind permission of the Royal Astronomical Society)

[47] The National Gallery of Practical Science was the brainchild of Jacob Perkins, the American inventor and physicist. For a description of the Gallery's opening night see "Fashionable World," *The Morning Post* (12 June 1832), on p. 3. Ellis visited it again with his father on 31 January 1840.

[48] For a picture and description of Faraday's apparatus, see: https://www.rigb.org/our-history/iconic-objects/iconic-objects-list/faraday-magnetic-spark

[49] Charles Babbage, *On the Economy of Machinery and Manufactures* (London: Charles Knight, 1832).

[50] Peacock's other major works on algebra were his Report for the BAAS (1833) and a second, enlarged and revised, edition of his 1830 textbook published in two volumes (1842–45).

to end the longstanding controversy over the validity of the use of negative and complex numbers.[51] Although, like many of the other texts Ellis had been studying, it was aimed at undergraduates, its innovatory nature and its length of almost 700 pages, made it much more challenging. Ellis concentrated much of his effort on the lengthy third chapter which, as Peacock described in the Preface:

> […] contains a very lengthy exposition of the principles of Algebra in their most general form, of their connection with Arithmetic and arithmetical Algebra, of some of the most important general principles of mathematical reasoning to which they lead, and most particularly of the principles of interpretation of algebraical signs and operations […].[52]

which he read several times.

The following selection of Ellis's many comments on the text provide an insight into the development of his mathematical thinking as well as documenting his progress:

> *30 July 1833*
> Read Peacock's Algebra ch. 3. It is the toughest sort of book I ever met with. The style is not clear & the views themselves may be, for of this I cannot fairly judge, a little cloudy.
>
> *26 August 1833*
> Read Peacock's algebra for an hour and a half, and nearly finished the third chapter. The whole of his views are so recondite and abstruse that if they are adopted, we should be obliged to have two systems of algebra, exoteric and esoteric.
>
> *26 October 1833*
> Read Peacock. The 'principle of the permanency of equivalent forms' requires as the author says 'a great and painful effort of the mind'. Very few of those who study Algebra will I think take the trouble of mastering it.
>
> *14 April 1834*
> Read the third chapter of Peacock's Algebra with Mr Davies. This celebrated third chapter will take us some to study: I mean, to analyse it.
>
> *24 April 1834*
> Read … the twelvth [sic] chapter of Peacock [General Theory of Simple Roots, with the Principles of the Application of Algebra to Geometry] with Mr Davies. The objections which the latter makes to the double use of $\sqrt{-1}$, being as it were both affection and quantity, seem to me more valid than the majority of his remarks.
>
> *5 June 1834*
> I think that the geometrical part of the twelfth chapter is almost if not without exception the most interesting part of the book. There is a fairness and ingenuity in it which is very unlike the special pleading of some writers on these subjects who seem to have a cause to support, and not the cause of truth, who though not enthusiasts are perhaps fanatics.

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[51] The 'principle of the permanency of equivalent forms' enables results from arithmetical algebra to be transferred into symbolical algebra. For discussions of Peacock's work on algebra, see Helena M. Pycior, "George Peacock and the British origins of symbolical algebra," *Historia Mathematica* 8 (1981): 23–45; Kevin Lambert, "A natural history of mathematics. George Peacock and the making of English algebra," *Isis* 104 (2013): 278–302; Lukas M. Verburgt, "Duncan F. Gregory, William Walton and the development of British algebra: 'algebraical geometry', 'geometrical algebra', abstraction," *Annals of Science* 73:1 (2016): 40–67.

[52] George Peacock, *A Treatise on Algebra* (Cambridge, 1830), xxiii.

> *19 [21] June 1834*
>
> [W]rote some of the analysis of [t]he twelfth chapter. Mr Davies ar[ri]ved today, and we read the [11th] chap. of Peacock on Ratio and proportion. It is the best thing on the subject I know, and is one of the best chapter[s] in the Algebra, both as being very clear, and very ingenious and accurate.

As well as wanting to study the *Algebra* for its own sake, there was another reason why Ellis would have been keen to be familiar with it. Its author, Peacock, who was then the mathematics tutor for Trinity College, would be the person initially to oversee his mathematical education when he went up to Cambridge. On 9 June 1833 Ellis had received a long-awaited letter from Peacock providing him with a course of preparatory mathematical reading. In his letter, Peacock also recommended that Ellis spent the academic year 1834–35 with a private tutor. A year later, Ellis received confirmation from Peacock that he had been entered for Trinity. Following this, he spent the next couple of months in an intensive study of calculus, working through the translation of Lacroix's *Traité Élémentaire du Calcul Différentiel et du Calcul Intégral* (1802),[53] as recommended by Peacock and to which he had already been introduced by Davies, and working on Peacock's *Examples* (1824). In the meantime, in response to Peacock's advice, it had been arranged that in October 1834 he would go for tutoring with James Challis, future Plumian Professor of Astronomy and Experimental Philosophy who was then Rector of a village outside Cambridge,[54] in preparation for which Ellis had been sent an extensive reading list.[55]

As Ellis's time with Davies drew to a close, he reflected on his progress with him. The verdict was not altogether favourable:

> I must say that Mr. Davies has sometimes dragged me forward, & at other times for want of a plan has kept me in the same place, so that my knowledge in mathematics is very different from what it might have been. (13 May 1834)

Two months later, just as Davies was leaving, Ellis hardened his views further:

> Mr Davies did not come, indeed I no longer expect him – So I read Lacroix by myself – I am determined – if as perhaps I may have, should life and health be spared to me, I ever influence any one's mathematical education – there shall be no teaching – no jockeying, getting on of the pupil. He shall be left to himself, after the first rudiments – Had this been my case, I had now been a mathematician – for I have fair abilities. (21 July 1834)

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[53] Lacroix's *Traité*, which was an abridged version of his three-volume work (1797–1800), was translated into English by Charles Babbage, John Herschel and George Peacock (1816) for the use of students at Cambridge. For a discussion of the contents of the Lacroix's original text, see João C. Domingues, "S.F. Lacroix, *Traité du Calcul Différentiel et du Calcul Intégral*, First Edition (1797–1800)," in Ivor Grattan-Guinness, ed., *Landmark Writings in Western Mathematics* 1640–1940 (Amsterdam: Elsevier, 2005), 277–291.

[54] Challis, Senior Wrangler of 1825, who had had to resign his Fellowship on his marriage in 1831, was appointed to the Plumian chair in 1836. He was Rector of Papworth Everard from 1830 to 1852. Today he is best remembered for failing to identify the planet Neptune in 1846.

[55] The reading list consisted of some 40 to 50 books, mostly related to classics, reflecting the type of tuition that Ellis would receive. See Stray and Crilly in this volume for details of Challis's tutoring.

His patience with Davies, who had been spending more and more time away, had run its course, and his exasperation with him was palpable. Even so, his assessment seems rather harsh given the extent to which he had developed mathematically during their long association. But Ellis had now surpassed Davies mathematically and there was little more Davies could teach him. Moreover, his preference was for calculus and algebra, and the more abstract the better. There was little room for the geometry of Euclid and the other classical authors so beloved by Davies.

On 24 October 1834, Ellis and his father arrived at Papworth Everard, the village some 13 miles outside Cambridge where Challis was Rector:

> We stopped - & got out - & a fussy little man introduced himself as Mr Challis - & two, to my eyes, yahoos as his pupils– However we walked all five about half a mile to his house which is pleasantly situated–- & I underwent an introduction to madame, & in an hour I was alone. … We dined at five & began to brighten up – Crowfoot & Barrett are the two beside myself – both gentlemanly.[56] (24 October 1834)

Ellis's initial reaction to his fellow pupils was hardly favourable– "yahoos" then as now is not exactly a term of endearment. But this occasion would have been one of his first opportunities to see students of his own age with Cambridge aspirations and presumably he expected them to exhibit a similar demeanour to himself.

As far as mathematics was concerned, Challis' teaching plan was to 'begin at the beginning', a plan which Ellis thought not altogether bad, despite the fact that his mathematical preparation was far ahead of that required (25 October 1834). Nevertheless, shortly after arrival he was somewhat surprised to find himself having to study Bonnycastle's *Arithmetic*, an elementary textbook, first published in 1780 and designed for use in schools.

Despite plans to the contrary, Ellis's stay with Challis lasted only six weeks, the ill health which had dogged him throughout his childhood forced an early return to Bath.[57] Although Ellis was due to go up to Cambridge in 1835, his continuing poor health prevented it and resulted in two years of self-study before his arrival at Trinity in October 1836. Few of Ellis's journals have survived from this period, so little is known about his study at this time. However, in the summer of 1835, Ellis did express regret at not being able to return to Papworth Everard. By then he was not only missing the mathematical stimulus from Challis and from being in the company of other students, he also wanted to be away from Bath.

During the spring of 1836, Ellis made many visits to the BLSI to take advantage of the library. He spent much of his time immersed in Lacroix's textbook on the differential and integral calculus. It was a book he liked, and he read it several times. Some of the other works he studied were more advanced in nature, such as Babbage's 'profound essay' on the calculus of functions (1815–16) which required a 'great "concentration" of mind', and Fourier's theory of heat (1822), neither of which

[56] John Crowfoot was 12th wrangler in 1839. Ellis met with him again at Cambridge. Barrett was most likely Samuel Barrett who entered Queens' College in 1834, migrated to Pembroke College in 1835, and graduated B.A. in 1839.

[57] Harvey Goodwin, "Biographical memoir of Robert Leslie Ellis, M.A.," in Walton, *Ellis*, ix-xxxvi, on p. xiv.

were standard fare for undergraduates let alone for schoolboys (9–10 April 1836; 9 May 1836). He was also in touch with Davies, who sent him copies of his papers on magnetism (Davies 1835b, 1836) which he read attentively.

Although Ellis worked hard to prepare himself for Cambridge, he was not enthusiastic at the prospect of going up, in fact quite the reverse: he became 'sick of the very name of Cambridge' (24 May 1836). The highly intensive system of study for the purpose of succeeding in an examination was not suited to his temperament (or indeed for his health) and although he felt he would be unable to do himself justice, he could see no alternative. As the start of term approached, he became increasingly melancholic:

> It is useless for me to go to Cambridge. I am not covetous of honours certainly not of university honours. At Cambridge I shall only waste the best years of what will probably not be a long life, in regrets bitter and unavailing, in ceaseless mortification of spirit, in weariness of the flesh. So easily and so commonly do we lose sight of the end in the means. (1 August 1836)

But, despite such misgivings, to Cambridge he went.

2.4 Cambridge, 1836–1840

At the beginning of the nineteenth century, the normal route to a Bachelor of Arts degree at Cambridge was through the Senate-House Examination, popularly known as the Tripos. The examination was primarily in mathematics but included other subjects, such as logic, philosophy and theology. It began to be referred to as the Mathematical Tripos only in 1824, when the Classical Tripos was examined for the first time, although students could enter the Classical Tripos only if they had already obtained honours in the Mathematical Tripos.[58] As the century progressed the examination took on an ever-increasing significance. There was a shift from oral to written examinations, with success in the final examination being paramount, and a concomitant rise in private tutoring without which such success was virtually impossible. It was a fiercely competitive examination and a high place in the order of merit—to be a wrangler or more especially senior wrangler—garnered national recognition and was a passport to the career of the graduate's choice.[59]

Mathematics was the core of study at Cambridge not because it was preparation for a career as a mathematician but because it provided a fundamental part of a

[58] For a history of the Tripos examination and a discussion of its emphasis on mathematics, see John Gascoigne, "Mathematics and meritocracy: The emergence of the Cambridge Mathematical Tripos," *Social Studies of Science* 14 (1984): 547–584.

[59] An analysis of the careers of senior wranglers is given in C.M. Neale, *The Senior Wranglers of the University of Cambridge from 1748 to 1907* (Cambridge, 1907), a book published the year the order of merit was abolished. For an indication of the significance attached to being senior wrangler in 1840, see the anonymous short story "Tales of our University I: A Legend for Senior Wranglers," *The Cambridge University Magazine* 1 (1840): 59–69.

liberal education, the notion so strongly advocated by William Whewell.[60] The reason for studying Euclid's *Elements* was not simply to learn geometry. It was a training of the mind. That said, knowledge of Euclid provided (at least some) access to the single most important text a Cambridge mathematics student had to study: Isaac Newton's notoriously difficult *Principia*. Written primarily in the language of geometry, the *Principia* provided the most certain demonstration of human knowledge of the natural world. Mathematics also had the advantage that it provided a level playing-field in the final assessment of undergraduates, or at least that was the thinking at the time.

2.4.1 Tuition

When undergraduates began their mathematical studies, they did so under the direction of the college mathematical lecturer whose duties were to guide their reading and prepare them for the rigours of the college and the Senate-House examinations. When Ellis arrived at Trinity, Peacock was both the mathematics lecturer and a college tutor, so it was to Peacock he was expected to turn when he required guidance. But Ellis, who had already mastered much undergraduate mathematics and was far more advanced mathematically than his peers, had little need of such guidance. His contemporary Harvey Goodwin recounts how Ellis was 'much amused' by Peacock's surprise on discovering that Ellis, soon after arrival, was reading Robert Woodhouse's 1810 historical treatise on the calculus of variations,[61] a publication aimed at a mature mathematical audience and certainly not written with students in mind.[62] As well as the tuition provided by the college, there were lectures delivered by the professors. Not all students attended the lectures of the mathematics professors, and not all the mathematics professors lectured. While Ellis was an undergraduate the Lucasian professors—Charles

[60] Whewell set out his ideas in 'Thoughts on the Study of Mathematics as Part of a Liberal Education' in 1837 to which he added further remarks in *On the Principles of English University Education*, of which a second edition appeared in 1838. For a discussion of Whewell's influence on Cambridge mathematics, see Harvey W. Becher, "William Whewell and Cambridge mathematics," *Historical Studies in Physical Sciences* 11 (1980): 1–48.

[61] Goodwin, "Biographical memoir," xiv. Woodhouse's historical treatise on the calculus of variations was the first book-length treatment in English of the subject and is notable for its use of continental notation. Woodhouse, who held the Lucasian and Plumian chairs during the 1820s, provided the initial stimulus for the reform of British mathematics in the early nineteenth century and his publications, especially *Principles of Analytical Calculation* (1803) which introduced notions of the Lagrangian calculus, were influential in Cambridge. See Niccolò Guicciardini, *The Development of the Newtonian Calculus in Britain 1700–1800* (Cambridge: Cambridge University Press, 1989), 126–131.

[62] See the comment about Woodhouse's book in George Biddell Airy, *Mathematical Tracts on the Lunar and Planetary Theories, the Figure of the Earth, Precession and Nutation, the Calculus of Variations and the Undulatory Theory of Optics* (Cambridge, 1826), vii.

Babbage, who held the chair from 1828 to 1839, and Joshua King, who held the chair from 1839 to 1849—never lectured. Peacock, who had been appointed to the Lowndean chair in 1837, lectured on astronomy and geometry, and Challis lectured on hydrodynamics, pneumatics, and optics, giving practical demonstrations.[63] Ellis attended these lectures but never took notes or asked questions. As he told Goodwin, the only reason he went to the lectures was to avoid the trouble of having to read up the subjects for himself.[64] Challis' experiments, such as those with air-pumps, did not excite him either.

George Peacock's Lowndean Lectures

'These Lectures are given in the Lent Term, and the object proposed by them, is to make students acquainted with the present state of the science of Astronomy, and with the practical methods of observation, which are commonly followed in modern Observatories; the most important astronomical instruments or models of them are exhibited, and the use of them explained, either in the Lecture Room, or at the Observatory. As this Professorship was designed by the Founder to comprehend Geometry as well as Astronomy, it is hereafter intended by the present Professor, to give Lectures alternately on Astronomy, and on Geometry, and the general principles of Mathematical Reasoning' (*Cambridge University Calendar* (1839), 116).

Another reason for Ellis's behaviour in lectures, was his delicate eyesight which he protected whenever possible. Not only did he listen to lectures without writing but he often employed someone to read mathematics to him, even technically advanced subjects such as the theory of the figure of the earth as given in Pratt's *Mechanical Philosophy* (1836), a text full of complex expressions and equations.[65] That as an undergraduate he could comprehend such mathematics without seeing it written down on the page is quite remarkable.

As well as Euclid's *Elements* and Newton's *Principia*, there were several mathematical textbooks which Cambridge students were expected to study, many of which had been written by former wranglers and were designed specifically for students of the university. As described above, Ellis was already familiar with many of these, including those of John Hymers who was among the most prolific and influential of textbook writers of the period. Hymers, who successfully combined his college career with private tutoring, had a reputation for being 'profoundly versed in mathematics' with a 'vast acquaintance with the mathematics of the

[63] Peacock's lectures were advertised as 'Science of astronomy and practical methods of observation; use of Instruments. Geometry, and general principles of Mathematical Reasoning'. Challis' lectures were published as *Syllabus of a Course of Experimental Lectures on the Equilibrium and Motion of Fluids and on Optics* (Cambridge, 1838).

[64] Goodwin, "Biographical memoir," xv.

[65] Goodwin, "Biographical memoir," xv.

Continent'.[66] The second edition of his *Integral Calculus* (1835) introduced English students to the newly discovered topic of elliptic functions, while his *Treatise on Conic Sections and the Application of Algebra to Geometry* (1837) became the standard textbook on analytic geometry. But Ellis was not so easily impressed. He had read Hymer's analytic geometry with Davies and considered it to be 'the most ugly amongst books' (14 November 1832). And Ellis was not the only one to express dissatisfaction with Hymers. It seems Hymers' capacity for producing textbooks had been somewhat bolstered by the unacknowledged use of the work of others![67]

The 1816 translation of Lacroix's introductory textbook on the differential and integral calculus by Babbage, Herschel and Peacock—the book Ellis had studied on Peacock's recommendation—was an important stimulus for the introduction of analytical methods into Cambridge. It was followed by several new books which treated their subjects from an analytical perspective and became standard undergraduate fare. Among these were Whewell's books on mechanics and dynamics which Ellis had begun studying at the age of fourteen. Another staple text was George Biddell Airy's *Mathematical Tracts* which provided an analytical approach to problems of physical astronomy, the shape of the Earth, and to its precession and nutation, although Ellis considered Airy's discussion on precession to be 'very badly done' (12 July 1839). Originally published in 1826 while Airy was Lucasian professor, the second edition of 1831, which would have been studied by Ellis, included a new section on the wave theory of light. Another book promoted to Cambridge students by Whewell and Peacock, and which Ellis may have read at Cambridge is Mary Somerville's *Mechanism of the Heavens* (1831), Somerville's interpretation of Laplace's *Mécanique céleste*.[68]

In his first and second years, Ellis was in the first class in the college examinations, or a 'Prizeman' in college parlance, results which he achieved without the aid of additional tutoring. In his all-important third year and final (tenth) term he was privately tutored by the famous mathematical coach William Hopkins.

[66] R.E. Anderson (revised by Maria Panteki). "John Hymers (1803–1887)," *Oxford Dictionary of National Biography* (2004), doi: https://doi.org/101093/ref:odnb/14340

[67] Anon., "Scientific morality at Cambridge," *Mechanics' Magazine* 46 (1847): 317–321.

[68] See William Whewell, *On the Free Motion of Points, and on Universal Gravitation, Including the Principal Propositions of Books I and III of the* Principia*; the First Part of a New Edition of a Treatise on Dynamics* (Cambridge, 1832), v; Mary Somerville and Martha Somerville, *Personal Recollections, from Early Life to Old Age of Mary Somerville* (London, 1873), 172.

2.4.2 Coaching

Hopkins, who had been seventh wrangler in 1822, was the first of the Cambridge coaches to make a permanent living from private tutoring.[69] He rapidly developed a reputation as an outstanding teacher and his results were remarkable. Between 1828 and 1849, he 'personally trained almost 50% of the top ten wranglers, 67% of the top three, and 77% of senior wranglers', which amounted to 108 in the top ten, 44 in the first three, and 17 senior wranglers, and earned him the sobriquet 'senior wrangler maker'.[70] As Hopkins's reputation grew, he was able to pick and choose his students. By taking students in their second, or very occasionally, as was the case with Ellis, in their third year, he had time to assess their abilities and select the most promising before taking them into his tutelage. He taught in small classes, putting students of equal ability together which 'meant that the class could move ahead at the fastest possible pace, the students learning from and competing against each other'.[71] Or as one of his obituarists wrote[72]:

> The secret of his success as a teacher was the happy faculty he had of drawing out the thoughts of his pupils and make them instruct each other, while he took care that the subjects under discussion were treated in a philosophical manner so that mere preparation for the senate-house examination was subordinate to sound scientific training.

Although group coaching with Hopkins was the norm, Ellis appears to have had individual instruction. Unlike his contemporaries, he did not need coaching in mathematics per se, rather he needed his reading to be 'arranged and put in a form suitable for the Cambridge examinations'.[73] In other words, he needed coaching in examination technique. Although he detested the Cambridge system which he described as 'the crushing down of the mind and body for a worthless end' (3 December 1838), he knew if he was to have any chance of being a high wrangler he had to go to Hopkins.[74] And it was no minor commitment. Judging by the fees he paid—£42 for a year's worth of coaching—he was being coached six days a week.[75]

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[69] For a full discussion of Hopkins as a coach, including descriptions of the experience of being coached by him, see Alex D.D. Craik, *Mr Hopkins' Men: Cambridge Reform and British Mathematics in the nineteenth Century* (London: Springer, 2008).

[70] Warwick, *Masters of Theory*, 84–85.

[71] Warwick, *Masters of Theory*, 84.

[72] *The Gentleman's Magazine* (1866), 706, quoted in Tony Crilly, *Arthur Cayley: Mathematician Laureate of the Victorian Age* (Baltimore: Johns Hopkins University Press, 2006), 40.

[73] Goodwin, "Biographical memoir," xv.

[74] In contrast to Ellis, George Gabriel Stokes, Senior Wrangler of 1841 (the year after Ellis), thrived under the system. See June Barrow-Green, "Stokes's mathematical education," *Philosophical Transactions of the Royal Society A* 378:2174 (2020), doi: https://doi.org/10.1098/rsta.2019.0506

[75] See the diary entry for 15 May 1839. In 1852 Hopkins estimated that to a good student the cost of private tutoring for three years was approximately £150 (excluding additional coaching in the vacation). He was thus earning something in region of £750 a year through his coaching, a substantial amount and a sum much higher than the stipend of most of the university professors (Craik, *Mr Hopkins' Men*, 100).

It did not take Hopkins long to ascertain the potential of his student and before the Michaelmas term of 1838 was out he had told Ellis that he expected him to be senior wrangler.

Ellis provided no description of the mathematics he studied with Hopkins, but with his mathematical maturity he probably had more of a say in which subjects were covered than Hopkins's usual students. George Gabriel Stokes, who was in the year behind Ellis, kept the notes he made while with Hopkins and these give a good idea of Hopkins's usual style of teaching: theory given, examples worked through, and others left for the student to complete.[76] None of Hopkins's own notes appear to have survived, although he did publish an elementary textbook on trigonometry in which he used history of mathematics both to elucidate and to motivate the mathematics discussed.[77] Possibly he illuminated his teaching similarly, especially with a student like Ellis who had such broad interests. Although when Ellis read Hopkins's book back in 1834 he was less than enthusiastic about it:

> Finished Hopkins's trigonometry. It is but a poor thing. Plane trigonometry is to me what the air pump and the electrical machine are to Sir G. Gibbes[78] – a subject of which I am sick. (23 August 1834)

As well as tutoring Ellis, Hopkins also included him in social events. Sometimes these were dancing parties at which Mrs. Hopkins would provide partners for the young men 'according to their university reputation' (30 November 1839). Naturally Ellis was high on Mrs. Hopkins's list and on one such occasion he found himself in the happy position of dancing with 'the great Cambridge belle' Miss Lorraine Skrine, as well as with 'two other stars of less magnitude'.[79] He spent another

[76] Stokes's notes cover several different subjects, mostly in applied mathematics or mathematical physics. MSS Stokes Collection, PA 2–24, CUL, Manuscripts and University Archives. An idea of Hopkins's views on mathematics and what informed his teaching can be gleaned from a pamphlet he wrote in 1841 attacking proposals to reform the Tripos: William Hopkins. *Remarks on Certain Proposed Regulations Respecting the Studies of the University and the Period of Conferring the Degree of B.A.* (Cambridge, 1841). For Hopkins mathematics was important because it unlocked the secrets of the universe, and these proposals, which advocated the exclusion of various topics in applied mathematics, were not at all to his taste. Hopkins's pamphlet also provided a response to a recent attack by Peacock on private tutoring: George Peacock, *Observations on the Statutes of the University of Cambridge* (London, 1841). For discussions of the contents of the pamphlets by Peacock and Hopkins, see Craik, *Mr Hopkins' Men*, 67–69, 114–116.

[77] William Hopkins, *Elements of Trigonometry* (London, 1833).

[78] Sir George Smith Gibbes was a physician who practised in Bath and who gave the inaugural address at the opening of the BLSI in 1825. He earned his knighthood for being physician to Queen Charlotte, wife of King George III. The reference to 'the air pump and the electrical machine' is a reference to scientific instruments being used for show (see note 47). Ellis mentions Gibbes several times in his journal indicating that he was well-known to the family.

[79] Lorraine Skrine was the daughter of the banker Julian Skrine. Ellis was 'surprised to find her a ladylike and affectionate girl'. In 1844 she married Robert Phelps (5W 1833) Master of Sidney Sussex College and twice Vice-Chancellor of the University. It was reported that Phelps 'looked into everything about the house & is a capital hand at frying an omelet – Mrs. Phelps can't even keep the laundress's accounts'. See, John A. Venn, "Robert Phelps," *Alumni Cantabrigienses: A Biographical List of All Known Students, Graduates and Holders of Office at the University of*

evening in the company of three senior wranglers—Challis, Philip Kelland and Archibald Smith—together with George Green and Duncan Gregory.[80] Hopkins also maintained contact with Ellis out of term. When Ellis was staying in Dover during the summer vacation, Hopkins suggested to him they might meet for the day Boulogne. Ellis kindly declined.

Many years later, Hopkins related his memories of Ellis as a pupil:

> On one point he always seemed to puzzle me. The extent and definiteness of his acquirement, and the maturity of his thought, were so great, so entirely pertaining to the *man*, that I could hardly conceive when he could have been a boy.[81]

Clearly Hopkins saw Ellis as exceptional and someone to be treated exceptionally. It is probably fair to say that their relationship was more like one between two colleagues than one between a master and his pupil.

2.5 Examinations

At the beginning of 1839, Ellis's return to Cambridge was delayed several weeks by an attack of measles. When he did return, it was with a heavy heart. He felt sick of Cambridge and the whole wrangler-making process and yet he had almost another whole year ahead of him.[82] But he had already invested so much in the system that, despite his misgivings and doubts of success, there was nothing for it but to continue. He came top in the college examinations that summer, as he had anticipated, but even that gave him little comfort. And as Hopkins and Peacock continued to reiterate their belief that he would be senior wrangler, and so he continued to be full of self-doubt. The Michaelmas term brought further college examinations as well as examinations with Hopkins, and study for the looming Tripos intensified.

The term ended and he, together with several fellow students, remained in Cambridge for Christmas and New Year, preparing for the Tripos examination which started on 6 January.

There were six days of examination, with the papers becoming progressively more difficult.[83] The questions were of two types: bookwork and problems. The former required students to reproduce standard definitions, theorems, and proofs,

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Cambridge, from the Earliest Times to 1900. Part II from 1752–1900. Vol. V. (Cambridge: Cambridge University Press, 1922–1954).

[80] Of the attendees on 29 April 1839, the others listed by Ellis were Matthew O'Brien (3W 1838), John Ball (41W 1839) and Goodwin, the latter being the only other undergraduate.

[81] Goodwin, "Biographical memoir," xv.

[82] For the full journal entry for 8 February 1839, when Ellis is expressing these feelings, see Stray's chapter.

[83] During the nineteenth century, the examination went through many reforms. 1840 was the first year in which the examination lasted for six days, an extra day having been added to that of the previous year. A detailed discussion of the development and content of the examination is given in Warwick, *Masters of Theory*.

while the latter tested students' ability to apply what they had learnt to increasingly technical and challenging problems. These were not problems to be found in the back of books but problems constructed specifically for the examination, and it was not unusual for the examiners to base questions on their own research. Importantly, it was the problems that effectively determined the order of merit. There were two papers each day, two-and-a-half hours in the morning and three hours in the afternoon, making a total of thirty-three hours examination altogether. The papers were set by two Moderators and two Examiners who undertook essentially the same tasks, the only difference being that the Moderators were responsible for the 'papers of original problems', i.e. for the more difficult ones.[84] In 1840, the Moderators were Alexander Thurtell (4W 1829) and Thomas Gaskin (2W 1831), and the Examiners were Henry Wilkinson Cookson (7W 1832) and Archibald Smith (SW 1836), none of whom made a career in mathematics.[85] Every undergraduate had to take the first four papers and a failure to pass resulted in the student being 'plucked'; i.e. not allowed to continue his studies.[86]

For those aiming for high honours, preparation for the Tripos was a punishing experience; it is little wonder that the health of students was sometimes compromised, and their performance affected. It was a regime under which Ellis with his poor health could well have buckled. But as the American Charles Bristed, who studied for the Tripos between 1841 and 1844, described, Ellis was the exception that proved the rule:

> Indeed a man must be healthy as well as strong—"in condition" altogether to stand the work. For in the eight hours a-day which form the ordinary amount of a reading man's study, he gets through as much work as a German does in twelve; and nothing that our students go through can compare with the fatigue of a Cambridge examination. If a man's health is seriously affected he gives up honors at once, unless he be a genius like my friend E[llis], who "can't help being first".[87]

The examination itself produced its own casualties. In 1842 the second wrangler, C.T. Simpson, 'almost broke down from over exertion […] and found himself actually obliged to carry a supply of ether and other stimulants into the examination in

[84] Goodwin, "Biographical memoir," xix. Usually the Moderators and Examiners were recent wranglers, and usually at least one of the Moderators continued as either a Moderator or an Examiner in the following year, thereby ensuring continuity. Ellis himself would be a Moderator in 1844 and an Examiner in 1845. Moderators sometimes published solutions of the Tripos problems and Ellis, together with his fellow Moderator, Matthew O'Brien, did so in 1844. Robert L. Ellis, Matthew O'Brien. *The Senate-House Problems for 1844 with Solutions* (Cambridge, 1844).

[85] Smith was one of the founders of the *Cambridge Mathematical Journal*, a journal to which Ellis contributed and sometime edited. See Crilly's chapter in this volume.

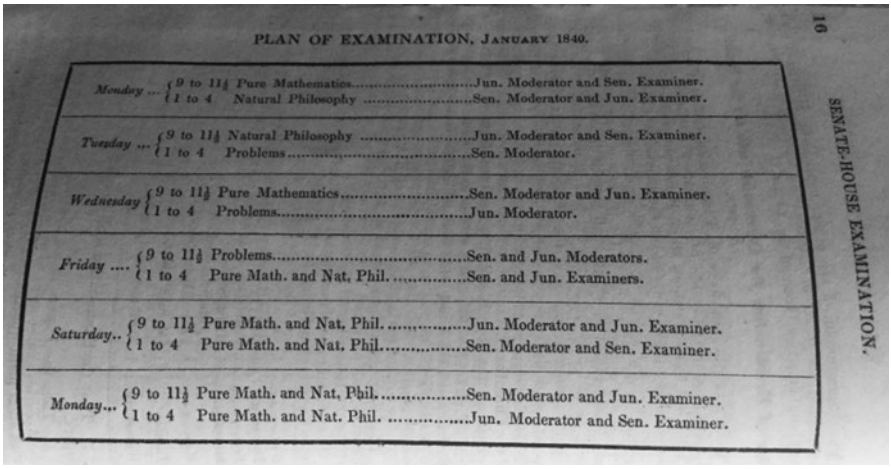
[86] Until 1850 students who had not obtained honours in the Mathematical Tripos were not allowed to sit the Classical Tripos. It was therefore possible for high-achieving classics students to fail to get a degree. In 1841, several of the best classics students from Trinity were spun out in this way resulting in a public uproar and a loud clamour for reform, see Christopher Stray, "The slaughter of 1841: Mathematics and Classics in early Victorian Cambridge," *History of Universities* 34 (2021), forthcoming.

[87] Charles A. Bristed, *Five Years in an English University* (New York, 1852), 331.

case of accidents'.[88] Worse was to happen in 1843 when 'a singular case of *funk* occurred' and the candidate concerned, T.M. Goodeve, ran away after four of the six days of examination and was found outside Cambridge some time afterwards.[89] Goodeve had been expected to be second wrangler but ended up as ninth, his absence thus proving not too calamitous. Indeed, as Bristed observed, the papers of the final two days affected the places of only the best ten to fifteen students.

When it came to Ellis's turn, there were 171 questions to be tackled over the course of the twelve papers (Fig. 2.3). Candidates were eased in on the first day with two papers being mostly bookwork, one in mathematics and one in natural philosophy, with explicit instructions not to use the calculus. These included standard questions requiring the reproduction of proofs from Euclid's *Elements* and knowledge of the first book of Newton's *Principia*. The next three days each included a problem paper and the rest of the papers were equally balanced between mathematics and natural philosophy. The majority of other questions were on algebra, the calculus, mechanics, dynamics, astronomy, hydrostatics and optics, with a few on heat, electricity and magnetism.

Many of the questions in the natural philosophy papers were clearly contrived, although some had a semblance of applicability about them. Notable among the questions of 1840 was one about a train on an inclined railroad, probably the first time that the railway had featured in the examination. (Cambridge would not have a railway station for another five years.) The artificial nature of the problems was


PLAN OF EXAMINATION, JANUARY 1840. 16

SENATE-HOUSE EXAMINATION.

Monday ...	9 to 11¼	Pure Mathematics	Jun. Moderator and Sen. Examiner.
	1 to 4	Natural Philosophy	Sen. Moderator and Jun. Examiner.
Tuesday ...	9 to 11¼	Natural Philosophy	Jun. Moderator and Sen. Examiner.
	1 to 4	Problems	Sen. Moderator.
Wednesday	9 to 11½	Pure Mathematics	Sen. Moderator and Jun. Examiner.
	1 to 4	Problems	Jun. Moderator.
Friday	9 to 11½	Problems	Sen. and Jun. Moderators.
	1 to 4	Pure Math. and Nat. Phil.	Sen. and Jun. Examiners.
Saturday..	9 to 11½	Pure Math. and Nat. Phil.	Jun. Moderator and Jun. Examiner.
	1 to 4	Pure Math. and Nat. Phil.	Sen. Moderator and Sen. Examiner.
Monday...	9 to 11½	Pure Math. and Nat. Phil.	Sen. Moderator and Jun. Examiner.
	1 to 4	Pure Math. and Nat. Phil.	Jun. Moderator and Sen. Examiner.

Fig. 2.3 Plan of the Examination, January 1840. (Source: *The Cambridge University Calendar for 1840* (Cambridge: J. & J.J. Deighton (1840), 16)

[88] Bristed, *Five Years in an English University*, 126.

[89] Bristed, *Five Years in an English University*, 163.

well-known and contributed to ongoing debates about the content of the examination and fuelled calls for reform. In 1841 Peacock made his views on the subject clear:

> The problems which are proposed in the senate house are very generally of too high an order of difficulty, and are not such as naturally present themselves as direct exemplifications of principles and methods, and require for their solution a peculiar tact and skill, which the best instructed and most accomplished student will not always be able to bring up on them. It is not unusual to see a paper proposed for solution in the space of three hours, which the best mathematician in Europe would hesitate to complete in a day.[90]

Lurking amongst the 171 questions was one that related directly to Ellis's later research. It was posed as the final question on the fourth day of papers and began by asking for an explanation of the nature and use of the method of least squares. Five years later, Ellis would write a paper on exactly this topic, showing himself to be one of the few people at the time who understood Gauss's contribution to its development.[91]

Ellis had one possible rival in the examination, Harvey Goodwin, who was also coached by Hopkins. Speculation was rife that Ellis's health might not stand up to the intensity of the examination which would give Goodwin his chance. But Goodwin acknowledged Ellis's mathematical superiority and recognised that should such a victory over Ellis occur, it would be a hollow one:

> Few things could have been less satisfactory than to find oneself decorated with a false halo of glory in consequence of the physical weakness of an incomparably superior man.[92]

Cambridge in early January can be a bitter place, and previous years had brought sufficient complaints about the coldness of the Senate House, that, as a temporary measure, the examination had been moved to Trinity. Candidates sat at long tables and the original seating arrangement, which students could inspect beforehand, had Goodwin and Ellis sitting almost opposite one another. For an unknown reason, possibly related to his health, Ellis asked to be moved to a different room, whether to be on his own or not, is unclear.[93] Aside from venting dislike of the problem

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[90] Peacock, *Observations on the Statutes of the University of Cambridge*, 153. Although there were several reforms of the Tripos during the nineteenth century, the artificiality of the problems persisted. Max Born recalled how the students in Göttingen at the beginning of the twentieth century made fun of the Cambridge problems by inventing one for themselves: "On an elastic bridge stands an elephant of negligible mass, on its trunk stands a mosquito of mass *m*. Calculate the vibrations on the bridge when the elephant moves the mosquito by rotating its trunk". Max Born, *My Life. Recollections of a Nobel Laureate* (1978), 282.

[91] Robert Leslie Ellis, "On the method of least squares," *Transactions of the Cambridge Philosophical Society* 8 (1844): 204–219. Reprinted in Walton, *Ellis*, 12–37. See Stigler in the present volume for an account of Ellis's work in probability theory.

[92] Quoted in Hardwicke D. Rawnsley, *Harvey Goodwin, Bishop of Carlisle: A Biographical Memoir* (London, 1896), 45. Goodwin, who later became Bishop of Carlisle, had little contact with Ellis when they were students but came to know him well afterwards.

[93] Goodwin, "Biographical memoir," xvi.

papers on the third and fourth days, Ellis wrote almost nothing in his journal about the examination, although he did describe his social activities, such as playing backgammon with his college friends.

The results came out on 14th January, the day after the final paper, and, as was common practice, they were widely circulated in both the national and local press. As predicted by all who knew him, Ellis was senior wrangler. Smith told him that it was not even close, and that he was ahead of Goodwin, who came second, by more than 300 marks.[94] He had even 'beaten' a paper, that is he had been awarded more than full marks for it; the extra marks being given for style in the bookwork.[95] Hopkins described Ellis as 'a senior wrangler among senior wranglers' (14 January 1840), and Peacock's reaction was to tell Ellis that he ought to get a fellowship at the first attempt which made Ellis think it worth a try.[96] Later in the day, he celebrated by drinking sauternes with his fellow examinees Alexander Gooden and Richard Mate.[97]

The ceremony at the Senate House at which degrees were conferred took place the following day. Ellis was a popular success, and great cheering rang out when he was presented to the Vice-Chancellor.[98] It was a theatrical occasion and, as he described in his journal, he was looked after by his friend, Joseph Hume (26W)[99]:

> At ten to the Senate House. Put on bands and hood, Hume sedulously superintending. Then mingled in the crowd: congratulated and was congratulated. Mrs Challis sent for me, & I went & spoke to her. Whewell came up & after congratulations hinted at the impropriety of being where I was; for which I relief I felt obliged. I returned to the bar where my friends were. Hopkins sent me down to the platform as I was to be marked up all the way. When all was ready, he and the other esquire [B]edell[100] made a lane with their maces, and Burcham

[94] Letter from Robert Leslie Ellis to Lady Affleck, 17 January 1840, TCL, Add.MS.a.81/69.

[95] Bristed, *Five Years in an English University*, 326.

[96] Ellis followed Peacock's advice and was elected to a Fellowship of Trinity in October 1840. Since graduates could sit the Fellowship examination three times and the examiners often favoured someone who was on their final attempt, to be elected on a first attempt was quite unusual.

[97] Ellis's Trinity friends fared variably in the Tripos. Alexander Gooden just scraped into the second class. His goal was the Classical Tripos and two months later he emerged as one of two Senior Classics. He died of peritonitis the following year. For details of his life and of Cambridge in the 1830s, see Jonathan Smith and Christopher A. Stray, eds. *Cambridge in the 1830s: The Letters of Alexander Chisholm Gooden* (Woodbridge: Boydell, 2003). Tom Taylor was 18th in the third class. Ellis considered him eccentric but liked and admired him. After a brief spell as Professor of English at University College London, Taylor made a career as a successful dramatist and editor of *Punch*. Walter Cockburn was seventh in the second class, and Richard Mate was 14th wrangler.

[98] It was customary for each candidate to be presented by a Fellow of his college. In Ellis's year, the Fellow for Trinity was Thomas Burcham.

[99] Ellis maintained his friendship with Hume after graduation. Hume's father was a doctor and a Radical MP, and he was well connected scientifically. On 24 May 1840, Ellis records meeting Charles Babbage and Charles Wheatstone at a dinner with the Humes in London.

[100] Esquire Bedell to the University is a partly administrative and partly ceremonial post. See Henry P. Stokes, *The Esquire Bedells of the University of Cambridge from the thirteenth Century to the twentieth Century* (Cambridge: Cambridge Antiquarian Society, 1911).

> led me up. Instantly, my good friends of Trinity & elsewhere, two or three hundred men, began cheering most vehemently, and I reached the Vice [Chancellor]'s chair surrounded by waving handkerchiefs & most head rending shouts. Burcham nervous; I felt his hand tremble as he pronounced the customary words "vobis praesento hunc iuvenem". Then I took the oaths of allegiance and supremacy and knelt before the Vice [Chancellor], who pattered over the "Auctoritate mihi &c" and shaking hands wished me joy. I turned back, & walked slowly & stiffly down the Senate House. More cheering. Hume met me, & led me to the open space just at the bottom – made me sit down, & said I was pale. – which I suppose was true, as I did not feel the excitement the less for showing but little symptom of it. Up came some gyp, with a bottle of salts, which I declined at first, but was bound in gallantry to take when I found a young woman had sent it to me from the crowd. (15 January 1840)

Goodwin also provided an account of the occasion although his was composed several years later. He recalled Ellis looking exactly the part and remembered his father saying to him that had he caught a glimpse of Ellis earlier he would have told him (i.e. Goodwin) that Ellis was unbeatable.[101] Whatever Ellis might have been feeling inside, it seems he carried the day with composure. But a further trial was yet to come.

The following week the leading wranglers knuckled down again to compete for the Smith's Prizes.[102] This took the form of more examination papers, each one of which was sat over the course of a day and set by a different examiner. Unlike the Tripos, the questions were mostly geared towards evincing an original or creative approach and often they had a discursive element. Usually only the most distinguished wranglers sat the examination, so the numbers entering were small, and it was not unknown for the number of candidates to be the same as the number of prizes. The prize was worth £25 but its real value was in the academic prestige attached to winning. The competition was a much sterner test than the Tripos and although to the outside world a prizeman did not carry the cachet of a senior wrangler, within the confines of the Cambridge mathematical community the honour was recognized as the ultimate achievement.

In 1840 the examiners were the three mathematics professors, Peacock, Challis, and King, together with the professor of mineralogy, William Miller.[103] Each paper consisted of about 25 questions, from aspects of pure mathematics to the construction and use of scientific instruments, and even the description of experiments. As expected, Ellis once again won the day. Goodwin had a rather harder time winning

[101] Rawnsley, *Harvey Goodwin*, 47.

[102] For a discussion of the origin and development of the Smith's Prizes, together with a list of winners up to 1940, see June Barrow-Green, "'A Correction to the Spirit of Too Exclusively Pure Mathematics': Robert Smith (1689–1768) and his prizes at Cambridge University," *Annals of Science* 56 (1999): 271–316.

[103] Miller had solid mathematics credentials having been fifth wrangler in 1826 and the author of Cambridge textbooks on hydrostatics and hydrodynamics (1831) and the calculus (1833). He had been elected to the Chair of Mineralogy in 1834 in succession to Whewell.

the second prize. He and Joseph Woolley, the third wrangler, were so close, they had to sit two deciding papers the following week.[104]

Ellis left Cambridge for London on the day the winners of the Smith's Prizes were announced, his student days behind him. A few years earlier he had thought that a senior wrangler could look to be either Lord Chancellor or Archbishop of Canterbury but no longer.[105] The punishing system had taken its toll and he left with his ambition stifled. He felt 'like some sick brute who would fain leave the herd to go into a corner and die' (29 February 1840). Studying for the Tripos and the attendant accumulation of examinations for over three years had put his health under a tremendous strain, both physically and mentally. Moreover, he had not restricted his mathematical output to examinations. During his final year as an undergraduate, he had had four papers published in the *Cambridge Mathematical Journal.*[106] And he was not only producing new results, he was actively taking issue with old ones, and robustly at that. In his first publication, which concerned properties of the parabola, he referred to a proof by the mathematician and Fellow of the Royal Society, John Lubbock, as 'tedious' and proceeded to provide a more elegant one, one which Lubbock did not immediately understand! Ellis made passing reference to Davies in this paper; it was the only time he mentioned him in his work.[107]

In view of what he had achieved, it is not surprising that in the immediate aftermath of the examinations, Ellis felt he had little left to give. But gradually he recovered his spirits and in October, as Peacock had predicted, he was elected to a fellowship at Trinity, and a new phase in his life began. His mode of preparation for the Tripos had been quite different to that of his fellow would-be wranglers, and the experience did little to dictate the course of his subsequent career. As one of his obituarists put it, his mathematical interests were 'as far as possible from being confined to the limits of a Cambridge course of reading for honours' as they could possibly be.[108]

[104] Rawnsley, *Harvey Goodwin*, 48. Woolly later made a name for himself as a naval architect.

[105] Although no senior wrangler attained such high office, these two positions seem to have been a popular aspiration. The following year, Stokes, after his success, was told he had only to determine whether he would be one of them or Prime Minister of England (Barrow-Green, "Stokes's mathematical education," 13).

[106] For further details of Ellis's mathematical work, and his relationship with the *Cambridge Mathematical Journal*, see Crilly's chapter in the present volume.

[107] Robert Leslie Ellis, "On some properties of the parabola", *Cambridge Mathematical Journal* 1 (1839): 204–208. Reprinted in Walton, *Ellis*, 63–67.

[108] Anon. [Forbes], "Robert Leslie Ellis," *The Athenaeum* 1685 (1860): 205–206, on p. 205.

Chapter 3
Ellis's Character, John Grote and the Cambridge Network

John R. Gibbins

3.1 Introduction

This chapter explores two questions: what did Ellis bring to Cambridge, and what did Cambridge do for Ellis?[1] The answers will be reached through primary source materials available in Trinity College Library and at Cambridge University Library. Two forms of analysis will intertwine: the first a textual study of sources on Ellis's character and friendships, and the second a contextual study of the Cambridge he inhabited, Trinity College and the Cambridge Network in particular – networks that shaped and provoked his unique and original contributions to knowledge.[2] While rich and well connected, confidently established within the Whig aristocratic elite, Ellis was sometimes portrayed as timid and reclusive. Why, with 'abundance of character and richness of endowment' did he appear 'different to different people?'[3] What explains the attestations to his charismatic personality, Stoic character and his devoted following? The best evidential account is provided by his closest and most loyal friend of two decades John Grote (1813-1866), the Knighbridge Professor of

[1] This essay was edited during the coronavirus lockdown in the UK in 2020 which prevented both travel and access to manuscripts in libraries. I wish to thank Jonathan Smith, Christopher Stray and Lukas Verburgt for their assistance. I also want to thank my wife Sheila, for her forbearance. All failings are of course my own.

[2] As an intellectual organization, the Cambridge Network received its first and clearest analysis in Walter (later Susan Faye) Cannon, "Scientists and Broadchurchmen: an early Victorian intellectual network," *Journal of British Studies* 4 (1964): 65–88.

[3] John Grote, *Exploratio Philosophica: Rough Notes on Modern Intellectual Science*, Part I (Cambridge: Deighton, Bell & Co., 1865) p. xxxvi. (Republished in 1900 with Part II by Cambridge University Press. A useful collection of essays on Grote can be found online at www.groteclub.org, where contributions on Ellis would be welcome.)

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L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0_3

Moral Philosophy and Vicar of Trumpington, and Charles Astor Bristed, a relative stranger whose path crossed with Ellis and Grote.[4]

About Ellis and Grote, Bristed, a Yale immigrant – happily stranded by ill health in Cambridge – wrote that they were the two most intelligent men in the University. Of Ellis, Bristed wrote,

> whereas geniuses of this kind are frequently one-sided and very much abroad in other subjects, he had knowledge enough of other branches to have given him a reputation without his Mathematics […]. Still it was not so much the extent of his information – for there were several men in the University, John Grote for instance, whose range covered more ground – that struck one so much as the power he had over it.[5]

It was to his companionship and conversation with Ellis that Grote would attribute all that was original about his own work.[6] From their first meeting onwards, the two were inseparable, talking for hours on every possible subject. Bristed refers to Ellis as a great 'Metaphysician', an attribution perhaps equally applicable to Grote.[7] But Grote's study of Ellis, published posthumously in 1872, is arguably the most reliable account we have of and about the man. As Grote summarized his incisive judgement of Ellis, he had '[i]ndependence, or individuality of judgement, with mental sociability, or attention and deference to the views of others'.[8]

John Pilkington Norris's (1823-91) contrasted account of Ellis as 'religious', and Goodwin's as the 'ideal scholar' are challenged here.[9] Ellis was the guardian of the Cambridge canon, Grote the canon itself. Ellis produced scholarly output in conversation and articles, Grote in lectures, essays and books. Ellis's reclusiveness allowed him the space and time to ruminate, and to produce a steady stream of brilliant and suggestive articles. The two inspired, prompted and pointed each other towards their shared goals. Grote's interrogation of Ellis led to the latter's description of Grote as 'the fiend', but they were co-dependent and co-productive.[10] We will argue that Ellis

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[4] See John Grote, *Exploratio Philosophica*. Part I; John Grote, "Robert Leslie Ellis: A study of character," *Contemporary Review* 20 (1872): 56-71; Charles Astor Bristed, *Five Years in an English University*. Second edition (New York: G.P. Putnam, 1852): 81-82; (John Willis Clark's personal copy can be found at Cambridge University Library (CUL), Cam.d.852.12); revised edition by Christopher Stray, *An American in Victorian Cambridge. Charles Astor Bristed's* "Five Years in an English University" (Exeter: University of Exeter Press, 2008): 81-82.

[5] Bristed, *Five Years*, 155-156

[6] Grote, *Exploratio.* Part 1, xxxv-xxxvii

[7] Bristed, *Five Years*, 156.

[8] Grote, "Study," 57; Grote, *Exploratio.* Part I, xxxvi.

[9] John Pilkington Norris, "Notes Privately Printed, 1853-1859," CUL, Cam.c.859.18; John Pikington Norris, "A Memoir of Robert Leslie Ellis, 1859," CUL, Cam.a.500.5178; John Pilkington Norris, "Ellis' Last Hours, 1860," CUL Cam.a.500.5, 178; John Pilkington Norris, "Review of the 'Biographical Memoir of R.L. Ellis' by H. Goodwin," *Athenaeum* (26 March 1864), Cam.c.864.25; Anonymous [James D. Forbes], 'Obituary of Robert Leslie Ellis,' *Athenaeum,* 11 February 1860, 205-206; Harvey Goodwin, "Biographical Memoir of the Life of Robert Leslie Ellis, MA.," in *The Mathematical Writings of Robert Leslie Ellis*, edited by William Walton (Cambridge: Cambridge University Press, 1863), ix-xxxvi.

[10] Robert Leslie Ellis to Lady Affleck, [not dated], TCL, Add.Ms.a.68/142.

was neither the ideal Cambridge scholar nor the deferential Christian that others have made of him. Instead, he was an eccentric Cambridge genius, catalysed by his environment, and a Pascalian, agonistic verging on agnostic, in religious matters.

3.2 Obituarising the Man

Obituaries have their genres, and those on Ellis roughly fall into three categories: ownership, in this case for devout Christianity, in John Pilkington Norris's contributions; scholarly and admiring, as in the case of Harvey Goodwin's; and analytic, as in the case of Henry Luard and John Grote's 'A Study of Character'.[11] On his death Ellis was subjected to some of the indignities that his long illness had inflicted – intrusive analysis, unwanted and unhelpful pontificating, diagnoses and prescription. Due to the peculiarities of his life, writing an obituary was something of a challenge. All resorted to a chronological account of birth, education, social life, prizes, publications and achievements.

Apart from one – the claiming of the deceased as a devotee of Christianity, in this case by Norris – Ellis was lucky with his biographers. Harvey Goodwin managed to conjure the excitement of possibility that Ellis's life engendered to his friends and readers alike. It was less what he did than what he could and would have done if a decade of debilitating illness and a death aged 41 had not ended ambition. To James David Forbes, Ellis was the 'perfect ideal of the academical character'.[12] He was '[l]earned without pedantry, studious without asceticism, clear in his convictions without dogmatism, eminently pious, gentle, urbane, and sympathising', while being 'engaging in demeanour and comprehensive in intellect'.[13] Forbes recognized Ellis's originality in pure reasoning, but occupationally he was more a muse than a conventional scholar. He inspired peers with his analytic conversational style, and called out the intelligence of his tutors with penetrating questions and hypotheses. He explored the abstract reaches of the mind (e.g. symbolic logic, integral calculus, inductive logic), and he aided Whewell as a consultant on such projects as the natural science curriculum, Roman Law and inductive logic. However, in order to dig deeper into Ellis's character we should engage with Grote's 'A Study of Character' rather than add details gleaned from letters and other sources.[14] Grote was at pains to distance himself from the judgements of his friends and colleagues whose views, he judged, had missed the key aspects that characterized his friend and marked his genius.[15]

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[11] Henry Richards Luard, "Robert Leslie Ellis," *Dictionary of National Biography, 1885-1900*. Vol. 17 (Oxford: Oxford University Press, 1888): 290.

[12] Anon. [Forbes], "Obituary," 206.

[13] Anon. [Forbes], "Obituary," 206.

[14] John R. Gibbins, *John Grote, Cambridge University and the Development of Victorian Ideas*, (Exeter: Imprint Academic, 2007), 59-61.

[15] Grote, "Study," 69-71.

3.3 Approaching Knowledge

Sharing most characteristics with his mother, Ellis was lean and gentle, with fragile health. Exposed to anxiety, he was thrown into its cold clutches at the age of fifteen, with the death of his youngest sister, possibly tilting him towards hypochondria. Fortuitously, Robert fell into a congenial companionship with his father, whose agile and analytical character of mind he embraced. Association with adult minds led to Ellis's adoption of mature ways of thinking from very early on, giving him 'a remarkable maturity and independence of judgement, […] an individual curiosity and interest in knowledge'.[16] Private tutors in mathematics and classics aided Ellis, who never attended school and who, apart from the tutoring, adopted the practice of reading and learning alone. His preferred method seems to have been that which he used for book learning; to work out a problem from the inside for himself, beginning from the beginning and ignoring passive or rote learning.[17] Ellis rarely made notes from books or lectures. Instead, he listened, digested, ruminated and thought things through until the problems and solutions became clear. These thoughts he often consigned to his diaries. Thinking was like making a puzzle come out, it was applying more and more intensity to the problem until the problem itself or the mist surrounding it cleared.[18] Mathematics allowed for more definiteness but it was always this characteristic that he sought and demanded. Secondary texts were a distraction, useful only as contextual aids. Ellis captured the essence of this process, intense focus and concentration, writing that '[t]he perfect calmness of introspective contemplation, of thought wholly dissevered from action, has a charm beyond most things: there is another kind of calmness which I have felt too, when the mind is steadily fixed on one object of pursuit, & feels its energies rise with the occasion – like the former it arises from the absence of discord between the thinking & willing parts of man'.[19] For such a mind, the most important primary source was conversation, which provided 'a good training for those qualities which were specially observed about him afterwards; – the definiteness of and readiness with which he expressed himself, the clearness of his ideas on such subjects as are likely to arise in conversation, and the apparently sharp and correct judgement about people who he met or saw'.[20] This observation requires some elaboration, for Ellis found his own mind, and others' conversations and behaviour, to be primary sources for analysis and judgement. His letters and diaries are full of observations on the foibles,

[16] Grote, "Study," 57.

[17] John Grote's application of this methodology can be found developed in a lecture for working people: John Grote, "Thought versus learning," *Good Words* 12 (1871): 818–23.

[18] These metaphors or analogies are used by John Grote while critiquing Whewell's adoption of Kant's 'manifold of experience' and explaining how knowing is an unpacking of what is entailed in immediate experience. See John Grote, *Exploratio Philosophica, Part II* (Cambridge: Cambridge University Press, 1900): 157–8, 205.

[19] See Ellis's diary entry for 2 May 1840.

[20] Grote, "Study," 58; Robert Leslie Ellis to John Grote, 14 November 1850 and 6 April [1851], TCL, Mayor Papers C12/28, C12/33.

skills, merits and demerits of his acquaintances, some really quite harsh and even cruel.[21] We must remember the confidence to observe, ruminate and analyse others that his wealth, connections and upbringing had conferred. Like Montaigne, he was morally engaged, yet also an insider looking out, amused, intrigued and motivated just enough to engage the understanding. His diaries and letters reveal a man living between 'act, character, and consequence, and also between ethical demands and the rest of life'.[22] These two likenesses of Ellis capture some of these qualities and provide materials for further analysis and judgement (Fig. 3.1).

A fidgetiness with concentration and focus made it possible for him to acquire the knowledge of a polymath, with interests similar to those of his Trinity colleague John Mitchell Kemble (1807-57). Greek, Roman, Arabic, Saxon, Viking, Danish and Norman sources on many different subjects were digested with equal enthusiasm. He was particularly concerned with the methods and thinking of Continental mathematicians, including Adrien-Marie Legendre (1752-1838), whom he probably met at John Herschel's home. Cervantes and La Rochefoucauld remained constant magnetic forces, with Ellis brooding in August 1835 on the latter's assertion that 'the heart of man is framed to reconcile inconsistencies' (11 August 1835). 'Largeness' he exuded and 'littleness' he eschewed, but his sheer 'intellectual eminence', 'moral courage' and 'integrity' led colleagues to both respect and trust his

Fig. 3.1 Chalk drawing of Ellis in Trinity, attributed by J.P. Norris to Samuel Laurence (1812-1884) (Norris, "Review," 2). (Reproduced by kind permission of the Master and Fellows of Trinity College, Cambridge)

[21] Grote, "Study," 64, 74; Goodwin, "Biographical memoir," xxxiii.

[22] Bernard Williams, "Shame and autonomy," in Bernard Williams, *Shame and Necessity* (Berkeley: University of California Press, 2008): 75–102, on p. 102.

judgments.[23] He applied coherence as his criterion of truth, and sought completeness and coherence of all facts, theories and judgments, always probing principles and foundations. However, according to Grote, such an 'intellectual conscientiousness' produced in Ellis 'the feeling of restlessness and dissatisfaction at anything being confusedly seen or not worked out, and of dislike at seeing it incorrectly put or fallaciously argued, [arising] from the feeling that truth is worth effect and patience…'.[24]

3.4 The Making of the Man

John Stuart Mill often fretted about the role of non-resident Protestant landlords in Ireland of the sort Ellis represented. Ellis indeed inherited lands from various relatives, yet he spent most of his time in Bath, Malvern and Cambridge with his set. In Cambridge he kept to a minimum invitations to bond closely with the Anglo-Irish aristocratic set represented by Charles Brinsley Marlay, whose family home is now the centre of the University of Nottingham. He did engage with clubs and societies in Bath (Literary and Scientific Institution), Brighton, London (Oxford and Cambridge Club), and Cambridge (Cambridge Union Society). He retired variously to Malvern and Bath for a decade after he became an invalid and reported a social life with friends from many areas of his life, whose names appear in his correspondence: George Dance from Bath, R. Mate, D.F. Gregory, E.M. Cope, H.A.J. Munro, A. Thurtell, J. Armitage, J. Spedding, W.H. Thompson, A. Smith, C.B. Marlay, W. Walton, A. Cayley, J.W. Blakesley, A. Smith, R.C. Jenkins from Cambridge and James D. Forbes from Scotland. It seems that in the 1840s, during his years as a Fellow of Trinity, Ellis often found many excuses to absent college for Bath, his father and friends; he missed Bath especially and his affections for Cambridge were always qualified and somewhat reserved.

His diaries and letters to his sister (Lady Affleck) reveal a very full, rich and even slightly extravagant social scene; breakfasting, dining, visiting galleries, having visitors, walking, riding, and reading. In many ways, and quite justifiably, Ellis was respected, consulted and feted by William Whewell, the most influential man in Cambridge, and was further indulged by Trinity, friends and family. By 1843, Ellis was able to confide of his astonishing run of good fortune; 'I went stumbling from one piece of good fortune to another for two decades' (30 November 1834). But in another letter he admitted to an existential ennui, what Grote identified as a 'lebensättigkeit', a weariness with existence, a discomfort with life, a deep melancholy with 'shades of mournfulness'.[25] Grote associated this with 'a dark view of man's lot in general', writing that 'the realities of life pictured themselves

[23] Grote, "Study," 64–5.

[24] Grote, *Exploratio.* Part I, xxxvii.

[25] Robert Leslie Ellis to John Grote, 25 August 1850, TCL, Mayor Papers, C12/21.

to him with full vividness'.[26] These were dispositions which Grote shared with Ellis. In reply, Ellis wrote in a letter from Great Malvern:

> that kind of dissatisfaction which young men often fall which arises when one is conscious of powers of enjoyment for action to which nothing corresponds in one's outward world. It is not that they have had too much of what life can give, but that they feel truly or falsely that it cannot give what they want.[27]

Ellis and Grote shared many features of the Hegelian recognition of the 'unhappy consciousness', forever wanting and pursuing with vigour hardly attainable ideals, made bearable perhaps by comedy.[28]

3.5 Character: The Man as Made

Ellis was not aloof, arrogant, not a 'recluse' as Goodwin judged, not introvert nor unsociable. He once ruminated that his life was 'destroyed by two things, my indifferent health and irritable temper – both misfortunes' (22 August 1835). On one occasion, he self-identified as possessing an 'unfortunate manner – the result of a compound of coldness with something between haughtiness and insolence' (10 December 1840). He was often withdrawn and sometimes difficult in company. This was in part due to impatience but also because he was vividly aware of human foibles and suffering, which unnerved him. Those parading platitudes, everyday opinions, fashions and commonplaces annoyed him, though he once advised an aspiring scholar in 1849 'to cultivate the act of being commonplace in habits as well as truth', as 'Cambridge is certainly a bad place for speaking one's mind'.[29] Grote contends that his friend was too aware, too conscientious, too serious for 'easy playing and almost trifling' activities.[30]

With Ellis, rumination led to brooding, brooding to foreboding, which became an insurance against future visitations and disappointment. He recorded in his diary for 6 January 1839 the return of 'that sickening feeling which comes over me from time to time, & which I can but ill describe, & with some degree of manners bitter dislike of Cambridge & of my repugnance of the wrangler making process. There is but one place for me & that I cannot obtain' (6 January 1839). He admitted to the return of 'old hypochondriasis which made me say, "Thy terrors have I suffered from my youth up, with a troubled mind"'.[31] Old scars had been opened, 'slightly healed

[26] Grote, "Study," 67.

[27] Robert Leslie Ellis to John Grote, 25 August 1850, TCL, Mayor Papers, C12/21.

[28] See Gibbins, *Grote*, 184–205; G.W. F. Hegel, *The Phenomenology of Mind* (London: George, Allen & Unwin, 1977), 251–67; 752–5.

[29] Robert Leslie Ellis to William Walton, 26 November 1849, TCL, Add.Ms.c.67/11.

[30] Grote, "Study," 67.

[31] Robert Leslie Ellis to John Grote, [not dated but probably after 1851], TCL, Mayor Papers, C12/31.

wounds' amplified by his normal 'nervous temperament and opium'.[32] Benevolent acts reflected his non-providential thinking: he gave generously to Grote's Subscription School, donated to Addenbrooke's Hospital, treated servants respectfully amongst many other acts of generosity. Stoicism, a form of worldly and wise acceptance of the vicissitudes of life, was the other chosen companion for melancholy. Ellis had 'the same taste for nature as Dryden', and spoke approvingly and understandably of Lucretius as well as of modern French explorers of the human conditions such as La Rochefoucauld, La Bruyère, Montaigne and Pascal, all early modern French explorers of the human condition.[33] The reasons why Rochefoucauld was referred to mostly lies in four factors: a complete rejection of essentialist, foundationalist and dualist ideas of the self associated with Descartes on one wing and the Utilitarians on the other; the recognition and acceptance that there were many varieties of self and natures mankind explores; that the admired ideals of Stoicism ignored the variety, complexity, nuances, sensibilities, drives, desires, fears and foibles experienced by contemporary humans; and hence, that it is better to explore the ever contingent human condition than a fixed human nature.[34] Ellis lived it, and Grote captured this with his concept of human *Egence* or *Want* that cannot ever find satisfaction or realization. Mathematics and science might offer some stability on the slippery surface, but also succour, escape and sometimes retreat until the final overwhelming episodes in later life.[35]

Society and etiquette had also been distractions, but the events above reinforced Ellis's ennui and melancholy. But at the start there was great optimism, many routes to advantage and a rewarding life. Sir William Napier had adopted Ellis as a patron and protégé, eventually pressing him to become Whig candidate for the Bath parliamentary seat. The early deaths of his two best friends at Trinity, Richard Mate and Duncan Gregory, created further dejection. He wrote from San Remo in 1849 that life is 'almost from the first, a decline, one prospect after another taken away, as the whole darkens until it is dark'.[36] Several brief biographical accounts show Ellis to have engaged actively with student life in Cambridge; he may have asked to take examinations in a room alone, but he entertained and was entertained in student

[32] Robert Leslie Ellis to John Grote, [not dated, probably after 1851], TCL, Mayor Papers, C12/31.

[33] Odette De Mourgues, *Two French Moralists: La Rochefoucauld & La Bruyere* (Cambridge: Cambridge University Press, 1978), 4-9.

[34] See De Mourgues, *The French Moralists*, 39-48; A.H. Blackmore, E.H. Blackmore and Francine Giguere, eds. *Francois De La Rochefouncauld: Collected Maxims and Reflections* (Oxford: Oxford University Press, 2007); Gibbins, *Grote*, 237-254; 347-348.

[35] John Grote, *A Treatise on the Moral Ideals* (Cambridge: Deighton, Bell and Co., 1876), 26-33. In a sermon preached on 15 May 1859, the first Sunday after Ellis's death, John Grote focused on his friend's fortitude and empathy: 'And suffering when it did come, instead of wrapping up his thoughts in self, only made him feel more what the suffering of others must be, and think more how he could help them. […] None ever felt more than our late neighbour that, suffer as he might, he was not the only one in the world who suffered. […] Thus in him, as the earthly man slowly and sadly failed, the inward man was renewed and grew'. John Grote in Joseph B. Mayor ed. *Sermons by the Late John Grote* (Cambridge: Deighton, Bell & Co., 1872), on pp. 244–245.

[36] Robert Leslie Ellis to William Walton, Good Friday 1850, TCL, Add.Ms.c.67/15.

rooms around the university according to John Norris, Gregory, Goodwin, Bristed and Grote.

Charles Bristed recalled his first meeting at Ellis's 'turret' rooms:

> There was the usual amount of awkwardness and hesitation on both sides, while I stated my reason for my visit […]. We gradually fell into conversation upon other matters, till lighting on old English Ballad Poetry which happened to be a hobby with both of us, we kept up an animated conversation to a late hour, and after that night frequently exchanged visits.[37]

He left a valedictory comment about Ellis, 'mathematical genius', which we are taking seriously here. However, in typically Ellisian fashion, poor Bristed was denigrated by Ellis for his efforts. He wrote, to his sister Lady Affleck '[s]o Bristed's book has reached you. I do not know if you would read it with more interest if you knew the real names – I remember but few now […]. The book is an impudent one and like the author who reminds me of La Bruyere's comparison of certain people to a dog in a church […] innocent of ill intentions and unable to see the impropriety of what he is doing'.[38] As hard on himself as on others, he repeatedly fretted at lost possibilities, unrealised ambitions and uncompleted missions.[39] For example, in what appears to be a dressing down to himself in August/September 1839/40 he commented that '[t]he fault of his character was a want of earnestness – decision and energy set against these – he was sincere in wishing to do right and his natural sentiments and dispositions […]'; he considered himself 'a dreamer of dreams' but ever 'nervous and irritable'.[40]

Grote summarised his review of his friend's character with the signifier 'many minded', referring to his ability to see things from a variety of perspectives, to empathize with the merits of contrasting views, which made him appear 'different to different people'.[41] He was less a Gregory and more a Dryden, Johnson or Boswell. Not so much original as many and deep minded. 'Ellis was peculiarly a many-minded man not simply from his wide knowledge, but from his early disposition and habituation to think for himself, and to apply his thought to whatever might be the matter suggested to him.'[42] Ellis recognized Grote's often overzealous intrusions into his (inner) life, and took care to not let the 'fiend' bind him into co-dependency.[43] But the significance of their relationship is implied in a long passage in the *Exploratio* from which I have abstracted the following:

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[37] Bristed, *Five Years*, 157.

[38] Robert Leslie Ellis to Lady Affleck, [not dated], TCL, Add.Ms.a.81/179.

[39] Ellis often wrote to his sister (Lady Affleck) in a confessional mode. See, for example, TCL, Add.Ms.a.81/68, Add.Ms.a.78, Add.Ms.a.171, Add.Ms.a.197.

[40] This quotation is found on a loose sheet added to a collection of letters, Robert Leslie Ellis to Lady Affleck, [not dated], TCL, Add.Ms.a.82/1.

[41] Grote, "Study," 70.

[42] Grote, "Study," 70.

[43] Robert Leslie Ellis to Lady Affleck, [not dated], TCL, Add.Ms.a.81/198; Robert Leslie Ellis to Lady Affleck, [not dated], TCL, Add.Ms.a.68/142.

> My companionship with him (Ellis) I think was intellectually the most valuable portion of my life, for one reason, namely I learnt from it (I say from it rather than from *him*, for I think it was from the concurrence and conflict of our minds, which were very different, a something not easy to describe, but which has been the soul of all my notions about philosophy since: one might call it a belief in thought: a feeling that things were worth thinking about, that thought was worth effort, that half-thought or loose thought was something to be despised, that the getting to the bottom of anything was what would repay the trouble of it.[44]

From an early age, '[t]he character of a philosophical lawyer' was 'remarkably to his [i.e. Ellis's] taste'; but Grote was anxious to connect this to the wider set of skills that Ellis was developing, writing that 'in the tracing of principles and analogies, and getting and embodying everything in the most exact and definite form, [Ellis] united a human and practical interest'.[45] Ellis was attracted to puzzles not worked out, to the intellectual challenge to work them out, and he had a deep 'respect for form, and for the *manner* of doing things', where 'the perfectness of the form was not the result of special attention to *that*, but was a sign of the clearness and completeness of the thought'.[46] Law and science share respect for fact, truth, evidence and proof, as well as for the search for guiding principles, theories, conjectures, logic, validity and sound judgement. Disrespect or failings in these in himself and others he treated with irritation, which the beneficiaries of his thinking tolerated respectfully. One unique feature of his friend Grote's ethical work shows the effects of this approach, the ideal of Jural Ethics. Traditionally, law is to be subservient to ethics and legal systems are to be analogous to ethical ones, as in Platonic and Natural Law traditions. It is worth mentioning that Grote deferred to Ellis's reversal of this connection, using law – its making, operation and reform – as a model to throw light upon the formation and development of moral and ethical systems. Ethics is best understood through jurisprudence and legal history than through, say, natural law and utilitarianism; and morality, in turn, is best understood as the codification of customs that have changed over time, much in the way that Justinian and Gaius codified Roman Law. In direct opposition to the arguments of Mill and other Utilitarians that law should be shaped by the ethical goal of the 'the greatest happiness of the greatest number', ethics is shaped by the same historical process of practice, codification and revision which have shaped English law. It is highly likely that the motive behind Ellis's translation of Gaius was to give force to this reversal in then-current academic thinking. The same might be said of the work on Roman history and law by Barthold Georg Niebuhr (1776-1831), some of whose works were translated by the Cambridge academics Julius Hare and Connop

[44] Grote, *Exploratio.* Part I, xxxv-xxxvi. Grote advanced (what one would today recognize as) a quite Wittgensteinian view, holding that thinking, conceiving and knowing are social in character. He considered them to be aspects of a 'co-intelligence'. His engagement with Ellis was a likely source for this conception. See Grote, *Exploratio.* Part II, 212–28.

[45] Grote, "Study," 62.

[46] Grote, "Study," 63.

Thirlwall (1797-1875).[47] In jural ethics, rights and duties in ethics are analogous to right and duty in law, obligation in ethics derives from status, position, relationships and not some superior moral principle. If one wants to know more about Ellis's ethics, politics and metaphysics, one needs not go much further than John Grote's corpus. The analogy of law and morality, distinct but similar, was a mantra of the Cambridge Platonists as well as of Whewell, and so the focus on and study of Roman (Gaius), civil and common law carried important implications for Cambridge thinkers.[48] With Ellis and Grote, there is an idealist demand that the actual captures and embodies the ideal, that things embody ideas, and that principles are abridgements of practices instead of *vice versa*.

3.6 Ellis and the Rising Tide of Doubt

We come then to the character of the man, the inner self embodied in his mannerisms, behaviour, acts and endeavours. Forbes observed that Ellis worked on 'the frontiers of Mathematics and Metaphysics, of Natural and Mental Philosophy'.[49] I want to explore this image of frontiers by drawing an analogy with the Victorian geologists and beachcombers depicted in Wiliam Dyce's 'Pegwell Bay: A Recollection of October fifth 1858' of 1860, found in the Tate Gallery. Beachcombers are trying to make sense of what they are unearthing on the frontiers of belief and knowledge, between new knowledge and beliefs inherited from the past. They study evidence before them with intensity, they 'notice' things, assess and judge on the basis of the evidence. We may imagine Ellis as living on this shoreline, between the land and the sea, old and new, ancient and modern, familiar and innovatory, but also between the the firm territory inland of established beliefs and knowledge and the dark, melancholic, risky sea that might carry him, and us, away. It was this association of Ellis with the second option that Lady Affleck and John Norris sought to erase in their review of Goodwin's 'Biographical memoir of Robert Leslie Ellis'.[50] They suggested that Ellis preferred to stay near the shore, metaphorically speaking, examining the sedimentary rocks, the driftwood, the weather and conditions for facts and evidence of traditional certainties about what existed and was worth exploring.

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[47] On Grote's jural ethics see Gibbins, *Grote*, 337–406. See also Berthold Georg Niebuhr, *The History of Rome*, translated by J.C. Hare and C. Thirlwall. 2 vols. (Cambridge and Oxford: Deighton and Parker, 1827); Henry Maine, *Ancient Law: Its Connection with Early History of Society, and its Relation to Modern Ideas* (London: J. Murray, 1861).

[48] David Palfrey, *The Moral Sciences Tripos at Cambridge University, 1848-1860.* unpublished Ph.D. thesis, University of Cambridge, 2002), 334-6; Jerome B. Schneewind, "Whewell's ethics," in Nicholas Rescher, ed. *Studies in Moral Philosophy.* American Philosophical Quarterly Series (Oxford: Oxford University Press, 1968): 108–41, on pp. 129–32.

[49] Anon. [Forbes], "Obituary," 206.

[50] See Norris, "Review," 3–4.

Ellis had engaged with the geological knowledge of Sedgwick and the astronomical knowledge of Herschel and he respected the received knowledge, history and experience encultured in these elder beachcombers' religion, legends and folklore. But he was analytical, sifting their judgments to get a 'fit' with what he thought to be better adapted to the scientific, historical and philosophical insights he had acquired. He was innovative and he contributed new insights, but he was less an explorer or adventurer than the analyst who examined what was known with sharper focus and deeper intensity, 'noticing' things, then producing new and better explanations and understandings. He shared with many knowledgeable mid-Victorians a rather uncomfortable unease, a melancholic reflectiveness, as the dominoes that made up the dominant ideology wobbled and toppled.[51] Norris did what he could to preserve the idea of religious fortitude to the end, but we know enough to judge this was an exaggeration.[52] Norris had been approached by Lady Affleck, who was keen to save her brother's moral reputation, virtue and honour from Gregory, Goodwin and Grote, who she considered had stressed wrongly Ellis's modern-age professional intellectual genius, skills and accomplishments. The two planned their riposte, stressing 'manliness' and 'character' rather than 'intellectual character', the assignment of sainthood and religious purity in the face of the opposing mere 'intellectual' characterisation as the quotation below shows. Rather than working at the frontiers of modern speculation, Norris stressed that Ellis sought to expose the 'irrelevance of modern speculation'.[53] This came via an obituarial re-write for the *Athenaeum* (after its initial rejection from *Macmillan's Magazine),* as reported by Walton.[54] Goodwin concurred with the re-write in his 'Biographical memoir'.[55] Norris reconstructed Ellis's mission as a 'voice against the undue estimate of intellectual power', and re-estimated his achievements as follows:

[51] The rise and prevalence of doubt is well illustrated in Alfred Lord Tennyson's poem *In Memoriam* of 1850 and earlier *Locksley Hall* of 1842. Contemporary Cambridge geologists, such as Sir Robert Murchison, Adam Sedgwick and later Charles Darwin were revealing fundamental discoveries with highly unsettling effects. See Charles Coulston Gillespie, *Genesis and Geology: The Impact of Scientific Discoveries upon Religious Beliefs in the Decades before Darwin* (Cambridge, MA: Harvard University Press, 1959); John Wyon Burrow, *Evolution and Society: A Study in Victorian Social Theory* (Cambridge: Cambridge University Press, 1970). The best accounts of the dominant ideology of mid-Victorian England can be found in Geoffrey Best, *Mid-Victorian Britain 1851-1870* (London: Fontana Press, 1979); David Watson, *The English Ideology: Studies in the Language of Victorian Politics* (London: Allen Lane, 1973).

[52] Norris, "Ellis's Last Hours," 205–6. This is a manuscript used by Norris to draft his own 'Review' of Goodwin's biographical memoir. A collection of his privately printed essays, including those on Ellis, can be found at CUL Cam.c.859/18, including a 'Memoir' of 1859 (CUL, Cam.a.500.5/178). The letters between Norris and Lady Affleck from 1859 and 1863–4, planning the revisionist 'Review', can be found at Trinity College Library: TCL, Add.Ms.a.68/152–7.

[53] Norris, "Review," 6.

[54] The fact that *Macmillan's Magazine* had rejected the 'Review' is reported by Norris in a letter to Lady Affleck in TCL, Add.Ms.c.68/155. Walton gives a report on the proposed revisions in a letter of 8 August 1863 to Lady Affleck at TCL, Add.Ms.c.68/160.

[55] See Goodwin, "Biographical memoir," xxxiii-xxxvi.

> To bear witness, or rather, perhaps, to be a witness against the characteristic tendencies of modern thought, to protest against idolatry of all kinds, – idols of intellect, of success, of physical science, of high art, – if not by lifting up his voice, yet by standing erect amongst a thousand who bowed down; to oppose to this the one true worship required of the mind no less than the heart; to manifest in every highest efforts of speculation the same principles of obedience and reverence to One who was yet higher, that he had acknowledged as the prayer of his childhood; […] this seemed to be the appointed purpose of his life and death.[56]

It should be remembered, however, that Ellis had a deep aversion to being forced into taking orders, to having to subscribe to conventions, musing that 'I begin to understand how men go into the church as a matter of convenience' (28 February 1840), a fate his wealth allowed him to avoid. There was probably some other aspects of Ellis's later life Fanny and Norris were expunging, something they considered shocking and shameful and which was popularly experimented with by aristocrats and aesthetes – hallucinogens, and opiates especially.[57] This might explain the many pages missing, carefully cut, especially from the diaries, but evidenced in letters to Grote. Ellis availed himself, and was pressed by others, to seek all remedies and cures for his condition, using galvanic apparatus, water and spa treatments but also including the prescription of opium. Opiates were freely available at chemists and prescribed by doctors to the upper classes. Laudanum usage amongst the poor was widely understood as needless intoxication and condemned. Amongst romantics and aesthetes like Samuel T. Coleridge and Thomas De Quincey, usage had some cachet, but respectable society harboured doubts about opium's capacity to undermine moral standards, encourage laxity and weaken manliness. Mark Pattison is reputed to have made his wife pledge denial of opium, even when advised by doctors, during a long and painful deathbed.[58] Ellis's acquaintance with opium had begun earlier. He recorded in his diary of 9 May 1840: 'Went to Deck's to get some solution of opium – the shopman asked me if I knew how to use it. He ought to have known me, but I suppose he had an idea equally lively & just of the misery of a 'good man's' existence' (9 May 1840). Over long periods of illness and depression, indigestion could and would have presented Ellis with many disturbing effects to both the users and carers. Ellis and Grote kept most visitors at bay from 1855 onwards, though for other reasons; infringement of Ellis's dignity, the shame and lack of respectability associated with invalidity and illness, practical hygiene reasons. But the disturbing effects of medications was most likely also a factor. From 1840 to 1859 most opiates and cocaine-based drugs were freely available for medical, experimental and leisure usage. Drug dens in cities, for the poor, doctors' prescriptions, for the well off, supplied a growing demand which itself created a moral crisis and scandal, with Coleridge, and De Quincey exposed in opium-eating

[56] Norris, "Review," 3.

[57] See Robert Leslie Ellis to John Grote, 26 January 1850, TCL, Mayor Papers, C12/24; Robert Leslie Ellis to John Grote, [not dated, but probably from after 1851], TCL, Mayor Papers, C12/31.

[58] See H. S. Jones, *Intellect and Character in Victorian England: Mark Pattison and the Invention of the Don* (Cambridge: Cambridge University Press, 2007); John Sparrow, *Mark Pattison and the Idea of a University* (Cambridge: Cambridge University Press, 1967).

accusations. Ellis's opium usage was legitimate and indeed essential, it did not fit into either the addict or romantic explorer paradigms.

With individuals who place a high value upon honour and attach great value to autonomy, the ever-present dangers are exposure to guilt and shame.[59] These may explain Ellis's growing reluctance to allow visitors to Anstey Hall.[60] Shame is a feature of my personal judgement of self and of 'what I am'.[61] Ellis's whole character exhibited self-surveillance, discipline and control, strengthened by a perfect 'sense of honour and propriety' for which autonomy was a precondition.[62] Shame is motivated primary by sight, and Ellis's whole appearance during the years of decline, which 'made him grieve over his forced indolence,' must have evoked this response.[63] Furthermore, shame is 'the emotion of self-protection' and in the experience of shame one's whole being is 'diminished or lessened'.[64] Embarrassment, in turn, is the indicator of present shame, hiding, and disappearing, the tactics usually deliberately chosen. Guilt is deeper still; the person in question understands that he has failed others in some way by acts of omission. Where shame is measured on a subject's own scale of respectability and norms, guilt tracks conventional morality or values; the former is self generated, the latter impressed upon the self.[65] Ellis had few grounds for guilt, and we read of his dislike of imposing upon friends for errands, support and kindness. His fashioned and highly-tuned character made a sense of shame understandable, perhaps even inevitable, considering the suffering that he himself considered too 'painfull to dwell' upon.[66] Norris's image of Ellis's last hours surrounded by Bibles rather than medical apparatus is understandable in this context. He would have performed a better task if he adopted Ellis's own handling of Gregory's last days. 'At length, on 23rd February 1844, after sufferings, on which, notwithstanding the admirable patience with which they were borne, it would be painful to dwell, his illness terminated in death'.[67]

The issue of the compatibility of belief in the sovereignty of the Divine with human suffering was evidently more than intellectual in the case of Ellis and his long and painful illness. As with his encounters with opiates, the questions of why God would let him suffer was forced upon him. Like Pascal in his *Pensées*, Ellis

[59] See Williams, "Shame and autonomy." 'Autonomy' was first coined by George Grote according to Alexander Bain. See Alexander Bain, *Autobiography* (London: Longmans, Green & Co., 1904), 258.

[60] See the letters from John Grote to Charles Brinsley Marlay regarding visits and Ellis's health. These letters are kept at Nottingham University Library, Marlay MSS. 2602, 2604, 2606, 2824.

[61] Williams, "Shame and autonomy," 93.

[62] Goodwin, "Biographical memoir," xxxiii.

[63] Goodwin, "Biographical memoir," xxxiv; Williams, "Shame and autonomy," 89.

[64] Williams, "Shame and autonomy," 89.

[65] Williams, "Shame and autonomy," 92.

[66] Robert Leslie Ellis, "Memoir of the late D.F. Gregory," in William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co., 1863): 193–201, on p. 200.

[67] Ellis, "Memoir", 200.

looked at the evidence for God's existence and the case for devotion with the eyes of a mathematician and philosopher. Unable to prove or disprove either, he seems to have reverted to probabilities, engaging with Pascal's 'Wager'.[68] 'His religion had something of a struggling character like that of Pascal, into whose mind he entered much, but few people have had more need of the comforts of religion than he had, and he found them'.[69] Perhaps when it came to religion Ellis was 'burdened with anxiety like Pascal'.[70] Ellis was more a Pascalian sceptic than a conventional believer – but he was certainly not an atheist – admitting to Grote: 'For my own part I am not very fond of declarations of belief but declarations of unbelief are surely a great deal worse'.[71] But the fact that Ellis resisted taking Holy Orders, which prevented the renewal of his Trinity fellowship, indicates serious reservations about religion, the clergy, or both. In his final days, Grote observed that Pascal's *Lettres provinciales* occupied Ellis's mind, rather than scriptures. These texts, written against the backcloth of censorship and religious intolerance, deploy wit, humour and satire to debunk casuistry and the logic of the Jesuists. Grote's own, more religiously committed views – which might be understood as a kind of rejoinder to Ellis on these matters – can be found in his essay 'Pascal and Montaigne' of 1877.

3.7 'A Galaxy of Great Men': The Cambridge Network

Ellis's roles within Trinity and the Cambridge Network are illustrative of how each party organized itself for mutual and enduring benefits. Both were powerful knowledge networks, the second extending beyond the borders of the first but building upon its structures, institutions and processes. The Cambridge Network was a coterie of intellectuals from many disciplines, who cooperated over decades to organise and reform knowledge production and reproduction. It achieved its goals, and the present eminence of both Trinity College and the Cambridge Network can be attributed largely to their early Victorian activities. 'A galaxy of great men' (15 October 1839), Ellis once quipped after talking with Whewell, Peacock and Heath. Within Trinity, a role was fashioned for Ellis that benefited the College but that also fitted with his preferences and skills. Ellis was not a conventional don; he did not take Holy orders; he was neither a manager of existing programmes nor a leader of new ones. He was not a College administrator or syllabus reformer, nor did he act as

[68] On Pascal's wager see, for example, Nicolas Rescher, *Pascal's Wager: A Study of Practical Reason in Philosophical Theology* (Notre Dame, Indiana: University of Notre Dame Press, 1985); James A. Connor, *Pascal's Wager: The Man who Played Dice with God* (San Francisco: Harper One, 2006); Ellis to Charles B. Marlay commenting that the evidence by itself 'can prove nothing for or against immortality', TCL, Add.Ms.a.67/6.

[69] Grote, "Study," 68.

[70] See Grote, "Pascal and Montaigne," *Contemporary Review* 30 (1877): 285–96, on p. 290.

[71] Robert Leslie Ellis to John Grote, 6 April [1851?], TCL, Mayor Papers, C12/33. Grote expanded on Ellis's relation with religion in his "Study," 67–8.

a reproducer of knowledge by regular tutoring, lecturing or textbook writing, though he did hold a titular role as Greek Lecturer and acted as a Moderator and Examiner in the Mathematical Tripos.[72] Perhaps he achieved the role once identified by Sir William Napier as appropriate for him, namely that of 'quasi fellow' (13 June 1840).[73] It might be best to say that he played various, equally valued roles that helped the University and College: setting and examining Tripos papers; helping create new or revising old curricula; responding to scholars such as William Whewell and Augustus De Morgan as a discussant[74]; assisting the under-librarian to translate and transcribe Newton's letters and diagrams[75]; sharing editorship of the *Cambridge Mathematical Journal*, co-editing Bacon's *Works*, supplying Whewell with arguments to defeat Mill over inductive logic[76]; assisting Whewell with revisions for a book of Butler's *Sermon*'s; providing evidence to prove that Roman Law was the embodiment of Roman ethics and morality; helping Whewell revise both his *Morality and Polity*[77] and his *Lectures on the History of Moral Philosophy*[78] and further a quasi-Kantian philosophy of knowledge to ground inductive logic; and then translating Gaius, probably from the original in Italy, in 1849.[79] Helping found and run the first professional journal dedicated to pure mathematics was by itself

[72] On the role of the Don see Sheldon Rothblatt, *The Revolution of the Dons: Cambridge and Society in Victorian England* (London: Faber and Faber, 1968). On the Cambridge Network see note 2. Ellis spoke of the Greek lecturing role and his 'sadness' and 'self-reproach' for his limited contributions in a letter to Whewell. See Robert Leslie Ellis to William Whewell, 8 August [probably late-1840s], TCL, Add.Ms.a.67/106.

[73] The full diary entry reads: 'if I felt my health unfit for active life, I should betake myself to Trinity & live there as a quasi fellow'.

[74] A good example of this correspondence is that between Ellis and De Morgan. See TCL, Add. Ms.a.67/111-2.

[75] Ellis at one point wrote to Whewell explaining his role in transcribing Newton's letters and diagrams, adding a 'Commentary' on Newton's intentions in the *Principia*. See Robert Leslie Ellis to William Whewell, TCL, Add.Ms.a.67/102.

[76] Ellis's discussions with Whewell on Bacon and Mill's logic is illustrated in some of his letters to Whewell. See, for example, Robert Leslie Ellis to William Whewell, TCL, 11 October [?], Add. Ms.a.67/105 and William Whewell to Robert Leslie Ellis, 29 March [?], Add.Ms.a.67/122.

[77] Whewell sought Ellis's permission to acknowledge his services in regard to 'my Morality'. See William Whewell to Robert Leslie Ellis, 12 [?] 1848, TCL, Add.Ms.a.67/121. See also William Whewell to Robert Leslie Ellis, 4 July 1848, TCL, Add.Ms.a.88/69. See William Whewell, *The Elements of Morality Including Polity* (Cambridge: John W. Parker, 1845).

[78] Ellis returned to the revised 'Preface' in TCL, Add.Ms.a.88 (63). Works on the 'Preface' to Butler's are returned to Whewell in TCL, Add.Ms.a.88 (64 and 66). Whewell sought permission to acknowledge Ellis's help with the 'Preface to my Morality' in a brief letter (see TCL, Add. Ms.c.67/16). See also William Whewell, ed. *Preface to Butler's Three Sermons on Human Nature and Dissertation on Virtue* (London: John W. Parker, 1848).

[79] David Palfrey mentions the Gaius work in his doctoral thesis: Palfrey, *Moral Sciences Tripos*, 167–79; 334–6. The best sources on Ellis's idealist epistemology are in the various works of Lukas M. Verburgt: Lukas M. Verburgt, "Robert Leslie Ellis's work on philosophy of science and the foundations of probability theory," *Historia Mathematica* 40:4 (2013): 423-454; and Lukas M. Verburgt, "Duncan F. Gregory and Robert Leslie Ellis: second-generation reformers of British mathematics," *Intellectual History Review* 28:3 (2018): 369-397.

remarkably innovatory and of great benefit to mathematics and mathematicians.[80] Ellis even dreamt of completing 'the propositions Newton left'.[81] All in all, he networked with and between some of the best minds in mathematics and philosophy of his day – and this with propitious results.

Eccentricity requires the ordinary, and in Cambridge in the mid-nineteenth century, the ordinary was, measured by contemporary standards, extra-ordinary. Ellis was in the company of giants, indeed of a 'a galaxy of great men'. Laura Snyder's two recent studies build upon a generation of revisionist writings that have challenged the received "Sidgwickian"[82] view of this pre-1860s period in Cambridge as one of conservatism, rationalism and intuitionism.[83] Her focus on one local elite, the four members of the 'Breakfast Club', narrows the focus, but the excitement of her recovery of these figures is undeniable. Walter (Susan Faye) Cannon originally unearthed the wider circle or coterie who drove the Club's ambitions; the more idealist Cambridge Network. Robert Preyer explained how this Coleridge-inspired 'Romantic Tide' reached Cambridge and swamped the lowlands of rationalism. Sheldon Rothblatt and Richard Robson then revealed how a new generation of dons embodied and then transformed the production and reproduction of knowledge, professionalising science, mathematics and law as well as furthering the newly emerging disciplines of psychology, anthropology, political economy, comparative

[80] On Ellis's role in the *Cambridge Mathematical Journal* see Crilly's chapter in the present volume.

[81] Ellis wrote on 18 September 1858 about completing a new edition of Newton's *Principia*, 'I have sometimes dreamt […] that had I lived I could have done something towards one, by filling up the propositions of Newton left unproven, as much as possible in his own manner, which has not I think ever been attempted' (Robert Leslie Ellis to Lady Affleck, 18 Sept. 1858, TCL, Add. Ms.a.81/92).

[82] Henry Sidgwick was a student and later friend of Grote, who later followed Grote into the Knightbridge Chair of Moral Philosophy. Having been immersed in the discussion group known as the 'Grote Club', he later distanced himself from Grote's and Whewell's philosophy. He identified their philosophy as rationalism rather than idealism. His jaundiced account of Cambridge intellectual life from 1830 to1866 can be found in Henry Sidgwick, "Philosophy in Cambridge," *Mind* 1:2 (1876): 235–46. Discussions of Sidgwick's role in the Grote Club can be found in Gibbins, *Grote*, 59–69; John R. Gibbins, "Constructing knowledge in mid-Victorian Cambridge: The Moral Sciences Tripos 1850-70," in Jonathan Smith and Christopher Stray, eds. *Teaching and Learning in Nineteenth-Century Cambridge* (Woodbridge: Boydell Press, 2001), 61–88. A discussion of Sidgwick's views on Cambridge and Grote can be found in Gibbins, *Grote*, 108–9; 455–8.

[83] The debate between Mill and Whewell, London and Cambridge, over how to reform the philosophy of the age is brought to life by Laura Snyder in these two books. The first assesses the missions and achievements of Whewell and Mill primarily; the second widens the focus to the knowledge networks around the two and the Breakfast Club especially, which comprised Charles Babbage, John Herschel and Richard Jones as well as Whewell. Her argument is that both networks sought to reform the age by reforming philosophy, and scientific methodology in particular. Laura J. Snyder, *Reforming Philosophy: A Victorian Debate on Science and Society* (Chicago: The University of Chicago Press, 2006); Laura J. Snyder, *The Philosophical Breakfast Club: Four Remarkable Friends who Transformed Science and Changed the World* (New York: Broadway Books, 2011). I cover this debate in Gibbins, *Grote*, 123–55.

studies and philology.[84] What we arguably know now from Snyder is not about the existence of such a Network, but more about its breadth, scope and almost unimaginable impact.

By the time that Ellis and Grote came to the attention of Babbage, Herschel, Airy, Hare, Whewell and Sedgwick, Cambridge was almost indisputably the leading centre of knowledge in Britain. This was accompanied by its embrace of emerging currents of idealism, largely home-grown but with influences from Scotland, Ireland, Germany and France.[85] The originators needed to pass on the baton in the 1850s; 'choosing' Ellis and Grote was the easy part. Getting genius to produce, and fast, was more difficult. What will be argued in this section is that Cambridge produced Ellis and Grote, and they in turn reproduced Cambridge. For Whewell, Ellis and Grote were the torchbearers of the Breakfast Club's mission; Whewell marrying Ellis's sister allowed Whewell to strengthen their bond through familial relationship. We will show that Ellis's few remarkable innovations were occasioned by this unique and fertile Cambridge world. Ellis was a genius, but that was both allowed and encouraged by the milieu he inhabited. In the diaries we find this account of a meeting between Ellis and Whewell that indicates how some of the missions, agenda and methods of the Network were reproduced.

> Went to Whewell, & had a long conversation with him about the fellowship, the method of induction, the value of Bacon's writings, the character of their merit, the application of the doctrine of probabilities to philosophy, which we agreed in thinking a vicious principii petitio. He was very civil. (7 March 1839)

The original Breakfast Club members gave themselves the same job as the Philosophical Radicals, the enormous and even presumptuous mission of 'reforming knowledge' for the modern age, and not just transforming science and philosophy

[84] Walter Cannon had begun his analysis of intellectual networks at Cambridge in 1962 in an essay on the Cambridge Movement. Walter F. Cannon, "The role of the Cambridge movement in early nineteenth century science," *Proceedings of the Xth International Congress of the History of Science* (Ithaca, 1964): 317-330. This was further developed in Walter F. Cannon. "Scientists and Broadchurchmen: an early Victorian intellectual network," *Journal of British Studies* 4 (1964): 56–88; and also in Walter F. Cannon, "The narrative role of science in Early Victorian thought," *History of Science* 3 (1964): 20–8. The argument for the romantic and idealist nature of the Cambridge Network's ambitions was developed in Robert. O. Preyer, "The Romantic tide reaches Trinity: Notes on the transmission and diffusion of new approaches to traditional studies in Cambridge, 1820-1840," in James Paradis and Thomas Postlewait, eds. *Victorian Science and Victorian Values: Literary Perspectives* (New Brunswick, NJ: Rutgers University Press, 1981): 39–68. The impact of these figures on the reform of Trinity College and teaching and learning can be found in Rothblatt, *The Revolution of the Dons*, and Richard Robson, "Trinity College in the age of Peel," in Robson, ed. *Ideas and Institutions of Victorian Britain: Essays in Honour of George Kitson Clark* (London: G. Bell and Sons, Ltd., 1967): 312–36.

[85] John R. Gibbins, "John Grote and modern Cambridge philosophy," *Philosophy* (Journal of the Royal Institute of Philosophy) 73 (1998): 453–77; John R. Gibbins, "Knowledge networks and British Idealism: An introduction," in John Gibbins and James Connelly, eds., Special Issue of *Collingwood and British Idealism Studies* 24:2 (2018): 145–69; John R. Gibbins, "George and John Grote, London and Cambridge: Brothers in rival worlds of the Victorian intelligentsia," *Collingwood and British Idealism Studies* 24:2 (2018): 217–49.

as Snyder asserts.[86] Equipped with the providential faith of the Liberal Anglicans and Broad Church theologians, and experiencing amazing leaps in knowledge around themselves in all disciplines, they met to plot the future of knowledge production and reproduction, making Cambridge generally, and Trinity particularly, a site of revolution.[87] Whewell was the constant, though contested leader and champion. His contemporary reputation is still undervalued today, which is largely the result of attacks by the Philosophical Radical Mill, from outside, and from his initial sympathisers, Leslie Stephen and Henry Sidgwick, inside Cambridge.[88] Menachem Fisch, Simon Schaffer and others, in *William Whewell: A Composite Portrait*, and Richard Yeo, in *Defining Science*, have previously drawn attention to Whewell's sweeping ambitions, both intellectually and politically. Perry Williams captured it by writing that 'Whewell's underlying aims were practical and political […] to counteract the spreading influence of utilitarianism, atheism, and radicalism by bringing people to appreciate the true nature of knowledge. His aim, in short, was to make subversive thought unthinkable'.[89]

The core intellectual elements of their network included, apart from the Liberal Anglican adaption of Vichian cycles to understand historical evolution, an eclecticism that imagined the truth as a synchrony of ideas, theories and facts. There was an openness to blending mathematical deductive certainties alongside inductive scientific discoveries, while accepting the authority of the classical canon. In a rather modern Cambridge way, they were committed to clarifying muddles via wide-ranging studies of languages alongside an idealistic, quasi-Kantian philosophical outlook. Here I agree with Verburgt rather than Snyder who considers Whewell's position as more akin to a priori intuitionism than idealism.[90] The Network shared other idealist commitments – e.g. a focus on the historical development of ideas, truth and knowledge, and a recognition that within ethics and law, the actual indicates the real, and the real contains the rational – all bound together with the Broad Church beliefs. Cognising and knowing involved human minds meeting each other; and learning was meeting other minds coming to you, and embracing the idea of coming to know the Absolute, gradually recognizing and building on the minds of predecessors and possibly understanding God's plans, the 'Divine Mind'.[91] Thought is a kind of co-intelligence; the world knowable, and it is our task to get to know it.

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[86] See Snyder, *Reforming Philosophy*, 1–26; Snyder, *Breakfast Club*, 4, 43.

[87] See Duncan Forbes, *The Liberal Anglican Idea of History* (Cambridge: Cambridge University Press, 1952).

[88] See Gibbins, *Grote*, 438–40, for this point. For more detail on many aspects of Whewell's life and work see, for example, the chapters in Menachem Fisch and Simon Schaffer, eds. *William Whewell: A Composite Portrait* (Oxford: Clarendon Press, 1991).

[89] Perry Williams, "Passing on the torch: Whewell's philosophy and the principles of English university education," in Menachem Fisch and Simon Schaffer, eds. *William Whewell: A Composite Portrait* (Oxford: Clarendon Press, 1991), 117–147, on 119.

[90] Cf. Snyder, *Reforming Philosophy*, 26, 45–51; Verburgt, "Duncan F. Gregory and Robert Leslie Ellis."

[91] Gibbins, *Grote*, 219–22.

Knowledge networks like the College, the University, the Breakfast Club, the Grote Club and the Cambridge Movement made such co-intelligence possible. As Grote, who, like Whewell and Ellis was a member of the Romantic node of the movement – tracing back to S.T. Coleridge and the Hare brothers – wrote: 'God has given us the choice to explore all options to satisfy our human want and to try to understand the want of God himself. Reconciliation of these and the realization of human and divine ideals are an avenue to everlasting satisfaction'.[92]

For the members of the Cambridge Network, and of the Breakfast Club in particular, developing 'an up to date version of Bacon's method, and spread the word in books, articles, and speeches' was agreed to be an essential tactical step.[93] Inductive logic was agreed to be the essential ingredient to the transformation of the sciences, and of knowledge more generally, but Bacon's methodology, while useful, was flawed and so unable to do the job. How could these flaws be removed and inductive methodology revised and reformed? What is at stake here is both the nature of the revision of inductive methodology within the Network, especially by Whewell, and the role that Ellis played in this process.

The original Breakfast Club members were stars of the nascent British Association for the Advancement of Science and of the wider mid-Victorian intelligentsia, also forming a local elite. Apart from Whewell, members included Adam Sedgwick (1785–1873), John Herschel (1792–1871), George Peacock (1791–1858), Richard Jones (1790–1855) and Charles Babbage (1791–1871); later associates who widened the 'Club' into a Network were George B. Airy (1801–92), Augustus De Morgan (1806–71) and James Clerk Maxwell (1831–78). Innovators from various intellectual centres and other Networks were invited and engaged to cooperate for mutual benefit. These included Julius Hare (1795–1855), who brought the best library of contemporary German philosophy to Trinity,[94] Frederick Denison Maurice (1805–72), philosopher and Broad Church theologian; two Irish prodigies, William Rowan Hamilton (1805–65) and George Boole (1815–64); several Scottish thinkers, such as Clerk Maxwell; and two Scandinavian revisionist historians, Baron von Bunsen (1791–1860) and Barthold Georg Niebuhr (1776–1831).

By the 1840s–50s, the main protagonists were ageing, and had realized that, in order for the overarching mission to be achieved, it needed to be further embedded within a new generation of Network members.[95] This is where Grote and Ellis came

[92] Gibbins, *Grote*, 35.

[93] Snyder, *Breakfast Club*, 43. For accounts of Whewell's theory of inductive logic see, for example, Menachem Fisch, "Antithetical knowledge," in Fisch and Schaffer, *William Whewell*, 289–309; and Gerd Buchdahl, "Inductivist *versus* deductivist approaches in the philosophy of science as illustrated by some controversies between Whewell and Mill," *The Monist* 55 (3): 343–367.

[94] See Roger Paulin, "Julius Hare's German books in Trinity College Library, Cambridge," *Transactions of the Cambridge Bibliographical Society* 9:2 (1987): 174–93.

[95] See Gibbins, *Grote*, 32; Grote, *Exploratio.* Part I, 203-241. For a discussion of how the received view of British philosophy after 1870 blocked recognition of the identity and significance of idealism within the Cambridge Network see Gibbins, *Grote*, 87–90, 123–30, 433–50, 464–9. The best short account of the Broad Church Movement is found in Francis Warre Cornish, *The English Church in the Nineteenth Century,* 2 vols. (London: Macmillan, 1910), vol. 1. 186–6, 299–316, vol. 2, 201–44.

to be identified as significant players for the Cambridge Network and its missions. Grote is easier to place: Whewell needed a philosopher who could unpack in more detail what was entailed in the new programme, as well as a successor in the Knightbridge Chair of Moral Philosophy and Casuistry. They differed on many things, including proposals for reforming Trinity College, the elimination of 'Casuistry' from the title and remit of the Knightbridge chair, and changes to the Moral Sciences curriculum and reading lists. Although Whewell would have been stung by Grote's two-chapter dissection of his inductive logic, he did advance Grote as his successor to the Knightbridge chair. Whewell got what he wanted; a mind able to sift out what was of value in contemporary British philosophy and reformulate a very English solution to contemporary problems around an idealist ontology, epistemology and ethics. Grote did not quite deliver on the propagandist front, but with the Grote Club, the appointment of Moral Sciences lecturers and important revisions of the Moral Sciences Tripos, he clearly achieved a measure of professionalisation in philosophy, history, law and economics at Cambridge.[96]

It is possible that John Venn (1834–1923) came to Ellis's frequency theory and the problems around chance, induction and probability, through exposure to Ellis via the Grote Club Meetings at Trumpington vicarage, where Venn's whole book (*Logic of Chance*) was talked over in the period before publication.[97] Grote brought on the next generation of Cambridge social scientists via his Club and influence including Venn, Joseph B. Mayor, Henry Sidgwick, Alfred Marshall, John R. Mozley, John B. Pearson, and James Ward. According to the Utilitarian and close friend of Mill, Alexander Bain, Grote contested effectively the main views of the Philosophical Radicals, especially those of Mill and Bentham on inductive logic and utilitarianism, in chapters 8 and 9 of the *Exploratio Philosophica* (1865) and the *Examination of the Utilitarian Philosophy* (1870). We find here what is perhaps the best critique of what at the time was the major alternative to the Network's ambitions.[98] Philosophical critiques of Mill's *Logic* were brief and few, which adds heightened significance to chapters 8 and 9 of the *Exploratio.*[99] With deepest respect and sincere motives, Grote calls upon the reader to identify numerous confusions, contradiction and incompatibilities, as with Mill's use of the term 'induction', and draws attention to methodological fallacies of relativism, "notionalism", "mis-phenomenalism" and "mis-psychology".[100] Mill responded to George Grote's

[96] On the Grote Club see Gibbins, *Grote*, 58–67.

[97] John Venn, *The Logic of Chance: An Essay on the Foundations and Province of the Theory of Probability, with Especial Reference to Its Application to Moral and Social Science* (London: Macmillan, 1866).

[98] Gibbins, *Grote*, 305–36; Alexander Bain, *Autobiography* (London: Longmans, Green & Co., 1904), 258, 253–56; Alexander Bain, *J.S. Mill: A Criticism with Personal Recollections*, (London: Longmans, Green and Co., 1882), 115; Jerome B. Schneewind, *Mill's Ethical Writings* (New York and London: Collier, 1965), 348; Quinton Anthony, *Utilitarian Ethics* (London: Macmillan, 1973), 83–7.

[99] Grote, *Exploratio.* Part I, 146-202; Gibbins, *Grote*, 212–14.

[100] Grote, *Exploratio.* Part I, 170–1.

invitation to respond to John's wide ranging criticisms with a footnote in the eight edition of the *System of Logic*.[101]

Ellis was also a profound critic; he considered Bacon's error to be less severe than Mill's, as Mill had the advantages of historical hindsight. He identified errors in Mill's *System of Logic*, pointing to Mill's reliance on an ideal-type methodology and his ignorance of how scientists actually work, of the history of scientific discovery and even of basic logic.[102] It is interesting to observe that Grote took on the major ("Whewellian") question of what the human mind brought to science, and to induction in particular, producing a very English form of 'real logic' that bore all the hallmarks of Ellis's thinking.[103] Grote and Ellis wished to revise the Whewellian (as well as the Baconian) corpus, expunging the errors and bringing out the potential in what was left of it, beginning with a reordering and reconception of the key sources and ending with Grote's two chapters of painfully precise critique.

Ellis possibly performed the greater task, considering that a reformulation of inductive logic through a reworking of Bacon – in such a way that Mill was proven wrong – was perhaps the key intellectual priority of the Cambridge Network. Whewell had published several reassessments of Bacon with which Herschel and others could not concur. At the same time, Mill's version of Baconian inductive logic, put forward in his *System of Logic*, was gaining ground, even at Cambridge. Douglas Denon Heath (1811–97), a first-class classicist and linguist, well networked within the Cambridge Apostles, became involved. But it was his professional experience with legal texts that made him key to making sense of the range and complexity of Bacon's unpublished manuscripts on professional legal matters. Ellis was in the right place at the right time in 1847; a brilliant mind without a mission who could not only sift out the key texts, but also understand them and assess them critically. Until 1853, when ill health forced him to withdraw from the project, Ellis worked hard on the Baconian corpus. Around 1849, he started to write the key to the whole project, a philosophical analysis and critique of Bacon's – and, *ipso facto*, Mill's works – on induction, with additional recommendations as to how they could be reworked to provide a new logical scientific method for modern science.[104] What stands is the combination of precision and brevity, insight and critical evaluation as well as surgical precision and metaphysical power, allowing him to deliver on Whewell's hopes. Replacing rationalism and intuitionism as the foundations of

[101] John Stuart Mill, *A System of Logic Ratiocinative and Inductive*. Eight Edition (London: Longmans, 1872), 39–40; George Grote gave Mill a copy of the *Exploratio* in 1865. Mill only made two references to the book despite two chapters being devoted to a critique of his *System of Logic*. These are found in F.E. Mineka and D.V. Lindley, eds. *The Later Letters of John Stuart Mill, 1849–1873*. Vol. 16. Part III (Toronto: University of Toronto Press & London: Routledge and Kegan Paul, 1963–1991), 1095–6.

[102] For Ellis's agreement with Whewell's criticism of Mill see, for example, Robert Leslie Ellis to William Whewell, 11 October (probably late-1840s), TCL, Add.Ms.c.67/105.

[103] See Gibbins, *Grote*, 175–222.

[104] For Ellis's Bacon scholarship see Verburgt's chapter in the present volume.

metaphysics and epistemology with idealism allowed Whewell to try and protect Cambridge from Millian influence.[105]

Despite Bacon's being a favourite read for Ellis, it is unlikely that he would have gravitated towards editing Bacon without being prompted by Cambridge Network conversations.[106] It was largely on his own initiative, however, that he engaged with other, closely related tasks, such as that of clarifying how inferences are made and how the validity of conclusions can be improved. One major activity, in this regard, was that of his work in probability theory, a topic almost completely neglected by Whewell. My suggestion is that Ellis provided useful service to Whewell, and the Network at large, originating new insights on the foundations of the theory, which he sought to make consistent with Whewellian views on philosophy of science.

The recovery of Grote's heavily annotated copy of Ellis's edition of the *Novum organum* gives us an insight into the intensity of the research, conversation and analysis that went on during this time in Cambridge.[107] This is the closest we will get to the productive conversations that Grote claims he had with Ellis, apart from their correspondence. Evidence for the concurrence of Grote's with Ellis's analysis of Bacon's methodology can be found in a footnote, containing a brief comparison of Bacon's and Mill's approaches, found in the *Exploratio*. 'Mr Mill criticizes Bacon's view, Vol. II. p.128, second Edit. See the accurate description given of this part of Bacon's method by Mr. Ellis, in his General Introduction to Bacon's Philosophical Works, Ellis and Spedding's Edition'.[108] Other key second-generation Network members included William Walton (mathematician, confidant and editor of Ellis), Isaac Todhunter (mathematician and Whewell's editor), John Seeley (historian), Henry Maine (comparative law), John Mitchell Kemble (the Anglo-Saxon scholar), Aldis Wright (the editor of the Cambridge Shakespeare), Richard Chenevix Trench (poet, philologer, theologian) and Frederick Denison Maurice (philosopher and theologian). We can arguably identify a philosophical lineage continuing later through James Ward, William Sorley, Ellis McTaggart, Charlie Dunbar Broad, Michael Oakeshott and Ludwig Wittgenstein.[109]

[105] See John Stuart Mill, "Professor Sedgwick's discourses on the studies of the University of Cambridge," *London Review* (April 1835), included in Jerome B. Schneewind, ed. *Mill's Ethical Writings* (London: Collier-Macmillan, 1965): 78–104; John Stuart Mill, "Dr. Whewell on Moral Philosophy," *Westminister Review* (1852), included in Jerome B. Schneewind, ed. *Mill's Ethical Writings* (London: Collier-Macmillan, 1950): 170–213.

[106] For references to Cambridge conversations see Ellis' diary entries for 1 November 1839, 24 December 1839, 7 March 1840, 4 April 1840, and 9 April 1840.

[107] In the possession of Dr. Edwin D. Rose, currently Munby Fellow in Bibliography at Cambridge University Library and a Research Fellow of Darwin College, Cambridge.

[108] Grote, *Exploratio.* Part I, 168.

[109] See Gibbins, *Grote*, 453–77.

3.8 Conclusion

Ellis's character made it possible for him to make the kind of innovations and contributions to knowledge that he made. At Cambridge he became inculcated into an already heady intellectual network that fed his mind and fashioned his wide-ranging intellectual engagements. Randall Collins has specified several conditions for a knowledge network to become of global, long-term value and interest. It has to have a size and range of skills in one place long enough to lay down permanent routes. It needs a few elites and many new members elaborating and propagandising its outputs. Above all it must find ways to reproduce itself as well as its knowledge and missions. Collins identifies the Cambridge Network – Whewell, Herschel, Babbage, Peacock. De Morgan, Cayley, Grote and Venn especially, but unfortunately not Ellis.[110] It is true that Robert Leslie Ellis was not one of the leaders, nor was he an obedient disciple. He was, however, an originator, a catalyst, a much admired and respected mind and a source of intellectual stimulation and innovation. His character, his conversations as well as his writings fully deserves the title of 'genius'.

Just how original Ellis was, how much he influenced colleagues, and how he contributed to different kinds of knowledge is what we are to decide in this book. Readers and critics will argue on the elements and significance of his originality, his influences and his impacts on scholarship and knowledge, but, there is no doubt as to the qualities of the man and the University which operated for mutual benefit.

So what did Ellis bring to Cambridge, and what did Cambridge do for Ellis? He brought a brilliant and original mind, a "post-Stoic", "proto-existentialist" character, a loved and admired friend and conversationalist. Cambridge provided him with a home, friends, a vocation, libraries, a vital channel for an active and acute mind. Personally, Ellis provided me with a beacon of hope and stimulation to keep researching Cambridge in this period, because he illustrated the sort of scholar Cambridge produced and housed in those heady days from the 1830s to 1860s. If he was John Grote's long-time companion, this meant Grote must have been as able and stimulating. For a long time Ellis was a puzzle, an enigma to me, one which we are today beginning to dispel. This book will hopefully give rise to a more firm grasp of the ephemeral mind that was Robert Leslie Ellis. For now, I will refer to Grote's neat summary of Ellis's intellectual nature, which Grote held to be 'a curiously happy mixture of independence, or individuality of judgement, with mental sociability, or attention and deference to the views of others' – a brilliant mind within a fertile knowledge network.[111]

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[110] See Randall Collins, *The Sociology of Philosophies: A Global Theory of Intellectual Change* (Cambridge, MA: Harvard University Press, 2000), 705–17.

[111] Grote, "Study," 57-58.

Of his friends and colleagues, Ellis probably thrived with and derived most from Gregory. We might take his own summary of Gregory's character to apply equally to himself:

> His upright, sincere, and honourable nature secured to him general respect. By his intimate friends, he was admired for the extent and variety of his information, always communicated readily, but without a thought of display, – for his refinement and delicacy of taste and feeling, – for his conversational powers and playful wit; and he was beloved by them for his generous, amicable disposition, his active and disinterested kindness, and steady affection. And in this manner his high-toned character acquired a moral influence over his contemporaries and juniors, in a degree remarkable for one so early removed.[112]

[112] Ellis, "Memoir," xxiii-xxiv.

Chapter 4
Robert Leslie Ellis as Editor and Contributor to Mathematical Journals

Tony Crilly

*In memory of Maria Panteki**

4.1 Introduction

Robert Leslie Ellis (1817–1859) was a true mathematician. He became a Renaissance man in the style of many Victorians, but the bedrock of his intellectual vitality was mathematics. This, coupled with the breadth of his reading, an extensive general knowledge, and a willingness to examine serious historical and philosophical issues made him an ideal candidate for editorial duties in the 1840s.

From an early age, individual tutoring fostered Ellis's natural ability and interest in mathematics.[1] In the educational regimen of his home in the Royal Crescent in Bath, 'Down by 6' or thereabouts, was invariably the first line of his diary entry; followed by daily thoughts, accounts of his reading, and the arrivals of teachers in mathematics and classics, not forgetting the appearance of 'Mademoiselle' to teach him French. This recording of life was begun before he reached his tenth birthday.

The youngest of six children, Ellis differed from his two brothers. They were men of action who had gone into the Army, but he was bookish and introspective. He took after his father, a member of scientific societies and Chairman of the Bath Literary and Scientific Association. Francis Ellis experimented in self-motivated scientific projects and was a competent mathematician himself, and he and his youngest son were constant companions as they joined in the intellectual activity in

*Maria Panteki. "Ellis, Robert Leslie (1817–1859)," Oxford Dictionary of National Biography, https://doi.org/10.1093/ref:odnb/8709

[1] The account of Ellis's early mathematical life is given in Barrow-Green's chapter in this volume.

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L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0_4

the town. They lived in a period described by Lytton Strachey as being the 'very seed-time of modern progress'.[2]

As his studies progressed, young Ellis just assumed he was destined for Cambridge University—at fifteen he had written in his diary: 'Read Peacock's "Syllabus of trigonometry &c". It is a useful book, especially to embryo Cantabs' (24 June 1833). Outwardly he was a confident young man. At sixteen he was reading the seminal text on Calculus by S. F. Lacroix, but in an attempt to gain inner assurance recorded: 'I begin to feel that confidence in myself, not only in Lacroix, but in every thing; & that feeling of looking to oneself for support is certainly the foundation of everything great—I am not of the herd,—whether or not I shall ever do any thing, I know not, & care but little; but I know this that I am not as many others are, that I am above the average' (22 July 1834).[3]

In 1834 Ellis's mathematics teacher, Thomas Stephens Davies, was about to leave Bath. He had learned much from Davies, but it was not an unwelcome parting as he had outgrown his mentor. It was time for a break, and Davies was himself embarking on a new life. After nine years with Ellis, Davies's own world was expanding. Elected to membership of the Royal Society of London, a lecturing appointment at the Military College at Woolwich followed.[4]

Ellis was sent to read privately with the Rev. James Challis with an eye to entering Trinity College Cambridge in the October of 1835. His new teacher, Senior Wrangler of 1825 and the winner of the First Smith's Prize, had achieved the famed double accolade at the head of the Cambridge honours board—and he had been elected a Fellow of the college in the following year. The mathematical degree at Cambridge was awarded as a result of a long set of written examinations held in the Senate House, known as the Mathematical Tripos (originally students sat on a three-legged stool to be examined in the oral tradition).[5] Depending purely on the number of marks scored, degrees were classified under three headings: Wranglers, Senior Optimes, and Junior Optimes. The Senior Wrangler was the student at the top of the whole list, in effect the champion student of his whole year, and as such, was much feted.

On marriage Challis had to resign his fellowship, and was in turn presented with the church living of St Peters in Papworth Everard, a village ten miles to the west of Cambridge.[6] Ellis arrived there by stagecoach in late October 1834 to be greeted by the proprietor; 'A fussy little man' (24 October 1834) was how Ellis saw his new

[2] Lytton Strachey, "Cardinal Manning," in Lytton Strachey. *Eminent Victorians* (Oxford: Oxford University Press, [1918] 2009), 9.

[3] For the wide range of Ellis's reading in mathematics see Appendix 2.

[4] The lecturing appointment at Woolwich with an annual salary of £300 was a considerable improvement for Davies.

[5] See, for instance, John Gascoigne, "Mathematics and meritocracy: The emergence of the Cambridge Mathematical Tripos," *Social Studies of Science* 14 (1984): 547–584.

[6] Papworth St Everard lies between St Neots on the Great North Road and Cambridge. In 1836 Challis was elected Plumian Professor of Astronomy and Experimental Philosophy in succession to George Biddell Airy who had been appointed Astronomer Royal.

teacher on arrival. It was a select establishment, preparing men for the university, and by reputation reckoned a 'much-coveted circle of private pupils' and usually consisted of just three students directed by Challis.[7]

The conundrum is that Ellis had no need to be there at all. Challis specialized in doing what he could for the students with a classics background who needed competence in mathematics to qualify for the Classical Tripos. He prided himself with starting at the very beginning of mathematics, a hurdle Ellis had conquered before his tenth birthday. There was one bonus. For a boy who had spent his youth in adult company, Ellis experienced the novelty of meeting students roughly his own age.

From Challis he would learn of Trinity College culture and the nature of the Mathematical Tripos. As an ex-Fellow Challis knew the system at Trinity, and had been active in tutoring and organizing College examinations. Additionally, he had taken students on reading parties to the Isle of Wight and the Lake District during the 'Long', the summer vacation that stretched from May till October. All this would undoubtedly counteract the negative attitudes towards Cambridge Ellis would have learned from Davies.

To his later regret, after only six weeks at the school, Ellis was forced to return to Bath on account of illness, and his intended entry to Trinity had to be postponed. Throughout his life he was plagued with poor eyesight, physical ill health, and mental depression, and this combination dictated the life he was forced to live.[8]

At the Papworth vicarage, Ellis just missed Harvey Goodwin who spent a year there in 1835–36. After a year's preparation, in which Challis opened his eyes to mathematics, and diverting him from focussing on classics, Goodwin would enter Gonville and Caius College in October 1836 and be Ellis's rival in the Tripos contest of 1840. He would eventually become Ellis's friend and his biographer.[9]

Ellis spent two more years in Bath. He was still being taught at home by his Classics teacher but reading mathematics by himself. His former teacher T. S. Davies kept in touch, and sent him his scientific productions by post. From his diaries we learn that he often visited the Bath Institution, the centre of intellectual life in the town and home of the Bath Literary and Scientific Association. It had a fine library and there he had access to mathematical journals.

By the summer of 1836, Ellis was getting ready for university again, writing in his Diary: 'Went to work in arranging my books for Cambridge. It is not encouraging to think nearly two years ago I did the same thing with no result' (17 June 1836). From Trinity College George Peacock sent him a list of books in preparation for the examination he would face on joining the College.

Before departing Bath, Ellis experienced doubts about going to Cambridge at all. He particularly despised the competitive element there, involved as it was with the

[7] Hardwicke Rawnsley, *Harvey Goodwin, Bishop of Carlisle. A Biographical Memoir* (London: John Murray, 1896), 31–32.

[8] He suffered a rheumatic disease. Many times in his diaries he refers to a 'blue devil day' a return of the demons indicating mental depression.

[9] William Hopkins had thought Goodwin would be the Senior Wrangler of 1840 but that was *before* he took Ellis as a student.

mathematics degree course. He made a melancholy reflection, the kind he made when in one of his depressive states: 'At Cambridge I shall not only waste the best years of what will probably not be a long life, in regrets bitter and unavailing, in ceaseless mortification of spirit, in weariness of the flesh. So easily and so commonly do we lose sight of the end in the means' (1 August 1836). With these reservations, and a propensity for inner turmoil, he went up to Trinity in October 1836 at the age of nineteen.

4.2 The Undergraduate

The start of Ellis's first year at Cambridge combined with his admission to adulthood. He was newly addressed as Mr. Leslie Ellis, or simply by his surname Leslie Ellis. Enrolled as a 'pensioner' like most other students, he was unlike them, even amongst other home-schooled entrants from wealthy backgrounds, for none could equal his mathematical sophistication. Under Davies's supervision he had already read Adrien-Marie Legendre, Gaspard Monge and Colin Maclaurin on Geometry as well as Lacroix on Calculus, and he had spent weeks studying George Peacock's *Algebra* (1830).

Now he was assigned to Peacock as his tutor at Trinity.[10] According to the custom of the Cambridge tutorial system Peacock was in *loco parentis* to his students and his duties entailed looking after both their material and academic welfare. It was well known that he took his duties seriously: 'He possessed great knowledge, a clear intellect, and a power of luminous exposition, joined to a gift of sympathy with, and interest in, his pupils.' A former student [and future Master of Trinity College], William Hepworth Thompson quaintly added: 'his inspection of his pupils was not minute, far less vexatious, but it was always effectual.'[11] Interviewing the pale youth from Bath, Peacock asked Ellis: 'What are you chiefly reading now?' Came the reply: 'Woodhouse's Isoperimetrical Problems.' Peacock was somewhat surprised having before him a freshman reading such advanced material connected with the Calculus of Variations.[12]

Formal teaching at Trinity took place on the three 'sides' of the college, where lectures were given to separate cohorts by William Whewell, Thomas Thorp and

[10] Peacock had been appointed as a mathematics lecturer at Trinity in 1815 and a college tutor in 1823. By 1830 he had become one of the eight senior Fellows of Trinity making up the *Seniority*. In 1837 he was appointed Lowndean Professor of Astronomy and Geometry and in 1839 the Dean of Ely Cathedral. His *A Treatise on Algebra* (1830) was a landmark in the history of mathematics.

[11] John Willis Clark, "Peacock, George (1791–1858)," in *Dictionary of National Biography* 44 (London: Macmillan, 1895), 138–140, on p. 138. Peacock might have been tutor for more than a hundred students, but he no doubt kept an eye out for those with promise.

[12] Robert Woodhouse, *A Treatise on Isoperimetrical Problems, and the Calculus of Variations* (Cambridge, 1810). Ellis had been exposed to isoperimetrical problems for polygons by T. S. Davies. Already as an eleven-year-old boy, Ellis had become acquainted with these problems, associated with polygons, in his reading (on 20 May 1829) of Legendre's *Éléments de géometrié*, a book given to him by his father two years before.

Peacock. Peacock's side was the largest with a reputation of being a home for the cleverest men. Ellis attended lectures but for the initial two years had no need of a private tutor, the recourse of most students with academic ambition. A fellow student remembered him attending Peacock's lectures on Plane Astronomy, at which he took no notes, but on leaving the room merely remarked that attending 'saves one the trouble of reading these things up.'[13]

Trinity College housed nearly a third of students of the whole university and was a world unto itself. This was a time where the colleges of Cambridge were far more important than the university, which mainly acted as an administrative structure. There were few university based activities but life revolved around the College. There was the university based Mathematical Tripos examination to think about, but for Ellis in 1836 that was ten terms away.[14]

Peacock was the member of staff closest to Ellis; Christopher Wordsworth (brother of the poet) was the Master of Trinity, and an unpopular one due mainly to his autocratic style of management. He ruled over the Senior Fellows of which Peacock was one. There was also a hierarchy amongst students. Starting out at Trinity Ellis would eventually know some of the senior students, but these probably had little time for a freshman.

Samuel Stephenson Greatheed had gone up in 1831 and had already graduated as the fourth wrangler in the Tripos contest of 1835. He was now preparing his way for the Fellowship examinations (in Classics, Mathematics, History, and Philosophy). In 1836 Archibald Smith was the current Senior Wrangler, and having taken the Fellowship examination in September was a newly elected Fellow. His academic prowess is evident by the award of a Fellowship at the first time of trying in the Examination. Another future contact for Ellis would be Duncan Farquharson Gregory now in his tenth term and preparing for the Tripos examination to be taken next January. Smith and Gregory were Scots, respectively from Edinburgh and Glasgow, and, as was the custom, finishing their education at Cambridge.

Ahead of Ellis were examinations at every turn. Trinity housed an examination ridden system: matriculation examinations on entry, annual College examinations, scholarship examinations, the university Tripos examination, and for the high flyers, the Smith's Prize examinations. Ultimately there were the Fellowship Examinations. Early on, Ellis distinguished himself, and he was awarded a scholarship in the spring of 1838, thus entering the 'pool' from which future Fellows were to be found.

Ellis was known about the college as both a polymath and a Senior Wrangler in waiting. The position of champion student was always a topic of conversation amongst his fellow students and college servants (who struck wagers on the outcome of the Tripos examination), but he learned of this future triumph first hand

[13] Harvey Goodwin, "Biographical memoir of Robert Leslie Ellis," in William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co., 1863): ix–xxxvi, on pp. xiv–xv.

[14] The course for the students taking mathematical honours was three years of three terms each with a tenth term starting in October of the final year, when the reality of the once and for all final examination to be sat in January was in prospect.

from his private tutor William Hopkins, the 'famed Senior Wrangler maker' who he employed in his final undergraduate year. He recorded this in his *Diary* at the beginning of this year: 'Went to Hopkins. He talked of my degree, said I ought to be senior wrangler & would be sure of the second place with very moderate labour. From the bottom of my heart I detest the system here—the crushing down mind and body for a worthless end—*Mais que faire*? [but what can one do?] How is one to break through the threads by which one is tied to it. […] I am weary of thinking of this odious subject' (3 December 1838).

Another groomed for the top prize, but two years later, was Arthur Cayley who had gone up to Trinity in 1838. To him the Final examination seemed to present no obstacle. In May 1839, just as Ellis was thinking of his ordeal in the coming January, he travelled on the same coach from Cambridge as Cayley. They were heading away for the Long Vacation: 'Off at ten. Cayley in the coach—the great man of the freshmen. He has my pity—yet probably needs none' (29 May 1839).

After nine terms (three terms each year), the honours students were ready to be sharpened for the Examination, and this was the function of the preparatory 'tenth term'. This term, starting in the October term of 1839, is where William Hopkins came into his own.[15] It was clearly necessary to acquire examination technique ahead of a solid week of examinations. The mathematics course that Ellis followed was equally divided between pure and mixed (applied) mathematics, the latter including the mathematics of Astronomy. This proportion was maintained in the questions set for the examination.[16]

To Hopkins, Ellis presented something of a puzzle—different, as he was, from all the other raw youths who sat in his rooms training for the examination. He perceived that Ellis had had a somewhat singular education, divorced from contact with students of his own generation. He had the maturity of a man, so much so, that Hopkins 'could hardly conceive when he could have been a boy'.[17]

In January 1840 Ellis took the once-and-for-all examination, then consisting of six days with five and a half hours of examinations each day. It had been the ordeal Ellis feared but when the result was declared all the pain was swept away, and he was even spared the need to go down to the Senate House to hear the public declaration. In a hurried note to his father, he could hardly contain his excitement: 'I am you will see senior wrangler, & Archibald Smith [an Examiner in 1840] has told me, more than 300 marks ahead of the Second [Wrangler, Harvey Goodwin]. *C'est tout dire* [That is all to say], except that Hopkins has been speaking in the most gratifying manner about the result.[18]

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[15] See Alex D.D. Craik, *Mr Hopkins' Men* (London: Springer-Verlag, 2007).

[16] See Barrow-Green's chapter in the present volume for the Tripos.

[17] Goodwin, "Memoir," xiv–xv.

[18] Robert Leslie Ellis to Francis Ellis, 16 January 1840, TCL, Add.Ms.c.67.5. While Ellis was 300 marks ahead of Harvey Goodwin (1818–1891), he was almost 1000 marks ahead of the 'Senior Wrangler elect' Joseph Woolley (1817–1889) who was the Third Wrangler (see Christopher Stray and Jonathan Smith, eds. *Cambridge in the 1830s: The Letters of Alexander Chisholm Gooden, 1831–1841* (Cambridge: Boydell Press, 2003), 165). The length of the Tripos examination increased over the years, and by 1848 it was already 8 days long.

Following his Tripos triumph Ellis prepared for the Fellowship examinations to be held in September. This too had a successful outcome, and in October he was elected.[19] The way was clear for the life of a Don. But even then he had doubts about his future. On further reflection he opted for Trinity College and settled into the life of a Don with rooms in Nevile's Court. In some ways it was an ideal situation for a person who was by nature a student. He had a more than adequate library and the company of colleagues who were also friends and the 'Collegiality' of Trinity formed a strong bond amongst the staff. Apart from voluntary resignation, the Fellowship would only come to an end if he decided to marry or declined to take Holy Orders at the end of the seven-year period.[20] It was a seven-year appointment to the 'Trinity Foundation' that included an annual share of the College Dividend.

Not only was being a Don an ideal position if a person wanted to pursue scientific interests, especially pure mathematical interests, and was not independently wealthy, it afforded one of the very few positions in England that enabled these interests to be pursued. William Hopkins warned that 'the real bar to the pursuit of science seems to me to be […] the difficulty which exists in England of a man living (out of College) by means of his scientific pursuits.'[21]

When it might have been plain sailing, the early 1840s was filled with sadness for Ellis. The death of his father and two elder brothers was a series of bitter blows. He had always been close to his father especially and his demise hurt him most. In consoling William Thomson on the loss his father in 1849, Ellis wrote: 'My father's death was, of a single event, the greatest grief of my life, which has been sufficiently chequered by suffering of various kinds.'[22]

In his new-found status of Fellow there was no specific duty to perform and he showed little appetite for teaching. He took no private pupils and only gave College lectures to help absent colleagues. Certainly he had no need to supplement his Fellowship income as many did. When he became a Fellow, he was not independently wealthy though due to the deaths on the male side of his family, in 1841–3, he inherited a substantial income.

A Don he was but he felt no compunction to conform to the usual norms of a young man setting out in his chosen calling. He confided in his *Diary*: 'As [Roman Emperor] Otho said, "why should I go into great halls? So much for ambition' (25 August 1840). One duty he was expected to perform for the university was to take

[19] Eight Fellows of Trinity College were elected in 1840, among them D. F. Gregory and R. L. Ellis. Dunbar I. Heath (Fifth Wrangler 1838), and William C. Mathison (Fifth Wrangler 1839, later appointed a mathematics tutor) were also elected.

[20] Ellis had been called to the Bar (Temple) in 1837 and could have made a career in the Law. He showed an academic interest in the law and he left behind Notes on the Civil Law.

[21] Quoted in John Heard, *From Servant to Queen: A Journey Through Victorian Mathematics* (Cambridge: Cambridge University Press, 2019), 35.

[22] Robert Leslie Ellis to William Thomson, 15 June 1849, CUL, Kelvin Collection, Ms.7342.E78.

his turn in being a Moderator for the Tripos—the setter of the examination questions, and he carried this out in January 1844.[23]

4.3 The *Cambridge Mathematical Journal*

In December 1836 Archibald Smith planted the idea of the *Cambridge Mathematical Journal* (the *CMJ*).[24] On the eve of Gregory taking his Final Examinations, Smith wrote to his fellow Scot with the idea of setting up a journal. Gregory was enthusiastic and volunteered to be editor—but only after the impending Tripos examinations of January of 1837.[25] He wrote back: 'But all this must be done after the degree; for "business before pleasure," as Richard said when he went to kill the king before he murdered the babes."[26] After the examination, in which he was ranked Fifth Wrangler, he took over the reins of the proposed journal.

The first number of the journal came out in November 1837—when Ellis was just beginning his second undergraduate year. The founders, Gregory, Smith, and Greatheed, were each in their twenty-fourth year, and each with their degrees secured. While Smith could claim to have originated the idea, Gregory was the working editor. In taking up this position he would have made a mental connection with a 'Physico-Mathematical Society' founded the year before in Edinburgh. For its first three years this society enjoyed a 'vigorous existence', a state of affairs hoped for in Cambridge with the new mathematical journal. In Cambridge there was the Cambridge Philosophical Society (founded in 1819) with its *Transactions* but this was the home for general scientific papers and it only came out in irregular intervals. Of the three founders of the *CMJ*, only Smith published a paper its *Transactions* (though Ellis would publish four papers in it). Papers published in the *Transactions* were unlikely to be of interest to the undergraduates focusing on success in the Tripos.

In being editor of the *CMJ* Gregory would have been aware that student interests could be ephemeral, like the ones that brought the short-lived Cambridge Analytical Society into existence at the beginning of the century. He would also discover that with an enterprise of this kind, writers are less plentiful than readers, and it would be incumbent on him to find contributors.

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[23] Ellis was Moderator (the setter of questions) for the Mathematical Tripos of 1844, and Examiner (a deputy to the Moderator) for 1845. Each year two moderators and two examiners were appointed.

[24] Parts of this section are drawn from Tony Crilly, "The Cambridge Mathematical Journal and its descendants: the linchpin of a research community in the early and mid-Victorian age," *Historia Mathematica* 31 (2004): 455–497.

[25] Archibald Smith, Duncan F. Gregory, Samuel Greatheed, were the founders of the *Cambridge Mathematical Journal*; Archibald Smith (1813–1872) (SW 1836); Duncan F. Gregory (1813–1844) (5W 1837); Samuel S. Greatheed (1833–1887) (4W 1835).

[26] William Thomson, "Archibald Smith," *Proceedings of the Royal Society of London* 22 (1874): i-xxiv, on p. iii.

The objectives of the *CMJ* were clearly stated in the first number, and were nothing if not grandiose:

> Our primary object, then, is to supply a means of publication of original papers. But we conceive that our *Journal* may likewise be rendered useful in another way—by publishing abstracts of important and interesting papers that have appeared in the Memoirs of foreign Academies, and in works not easily accessible to the generality of students. We hope in this way to keep our readers, as it were, on a level with the progressive state of Mathematical science, and so lead them to feel a greater interest in the study of it.

And it continued,

> For this purpose we shall spare no pains in selecting the most useful and important papers from which to take abstracts for the benefit of our readers, while we shall put them in such a form as to make them available in the studies of this place. At the same time we shall endeavour always to have such a variety of subjects treated of, that all classes of students may find in our journal something which may useful to them.[27]

As might be expected, Smith, Gregory, and Greatheed were the main contributors for the first number, and they contributed the bulk of the articles for the first volume (consisting of the first six numbers).[28]

The journal started well. Gregory invited his old Edinburgh teacher William Wallace, then on the brink of retirement, to supply an article for the first number. But, the *CMJ* was a journal primarily written by young mathematicians for their own generation. Where young authors saw improvements in the teaching of mathematics they used the *CMJ* to publicize them, as in the first number where Smith was critical of some texts in use at Cambridge.[29] A boost to the journal's popularity would be its role as a source from which the Moderators could frame Tripos questions—and this provided an added inducement to undergraduate readers.[30]

Overall the journal supplied mathematical articles from a wide field. In pure mathematics there were articles in plane geometry, analytical geometry of three dimensions, algebra, differential calculus, and the calculus of finite differences. In mixed mathematics, articles in astronomy, light and sound, mechanics, and hydrostatics were some of the themes pursued in the *CMJ*.

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[27] "Preface," *Cambridge Mathematical Journal* 1:1 (1837): 1–2, on pp.1–2.

[28] Gregory enlisted his Edinburgh teacher William Wallace to contribute an article—on triangles. Another Scot, William Pirie, wrote an article on analytical geometry. Smith insisted that two problems in analytical geometry should be seen as authored by Richard Stevenson (c. 1812–1837), a Fellow of Trinity who had recently died of consumption.

[29] Samuel W. Waud, *A Treatise on Algebraical Geometry* (Cambridge, 1835). Samuel W. Waud was a Fellow and Tutor of Magdalene College. He graduated Fifth Wrangler in 1825, but in 1837 gave up college life and was appointed to the church living at Madingley in Cambridgeshire. In addition to Hymers's texts, there were others available to students focusing on analytical geometry, both in English and French. Prominent among them was Henry P. Hamilton, *Principles of Analytical Geometry* (Cambridge, 1826). See Alex D.D. Craik, "Henry Parr Hamilton (1794–1880) and analytical geometry at Cambridge," *British Journal for the History of Mathematics* 35:2 (2020): 162–170.

[30] Andrew Warwick, *Masters of Theory: Cambridge and the Rise of Mathematical Physics* (Chicago and London: The University of Chicago Press, 2003), 157–163.

Under Gregory's editorship frequent use was made of pseudonyms. This served various objectives. It provided a camouflage of the fact that early numbers of the *CMJ* were written by a small coterie of authors, and single authors could be represented by several pseudonyms, leaving the impression of a broad range of contributors. The practice also provided a shield for young authors to be spared criticism from their seniors, and seniors spared embarrassment by superior writings from the youth. Moreover, too much advertisement of self was frowned upon in Cambridge, and frequently, notes and minor papers were printed under the authorship of such as σ, α, β, γ, δ, ϵ, π. Some bore a light disguise, as were Ellis's own notes just signed ε. Individualism and competition were essential components of a Cambridge education, but for the purposes of the journal, content was of the greatest importance—and not the identity of the author.

As a sixteen-year-old (before he had even set foot in Cambridge as an undergraduate), William Thomson (the later Lord Kelvin) contributed an article on Fourier's work on Heat signed P.Q.R.; by so doing he was shielded from controversy with Professor Philip Kelland of Edinburgh who had written differently about the subject. The by-lines G.S. and D.G.S camouflaged the appearance of two *joint* papers by Gregory and Smith. Joint papers were very much a rarity in any mathematical journal, these being published at the time when *individual* performance was prized above all else.[31]

Gregory soon found himself holding the reins of the *CMJ*. Greatheed had become a Fellow in 1837 but this 'little, shy, silent, squeaking voiced man' surprised Trinity society by marrying thus obliging him to give up his Fellowship.[32] Writing to him in Berlin while the journal was finalizing its first volume, Gregory wrote: 'The Journal is getting on pretty well—the 5th number is far advanced, and I have considered material for the 6th with which I intend to complete a volume. Are you going to send anything—a paper on the application of symbols to marriage proposals would be highly acceptable'.[33]

The oblique humour clouded the difficulty Gregory was experiencing in editing the *CMJ* single-handed. Smith, who had a law career in London to establish, was not much help either. In his appeal to Greatheed, Gregory complained of Smith having 'one of his continual lazyfits and will not put pen to paper'. Gregory was further put out by the knowledge that Smith intended 'to spend the summer yachting in Scotland'.[34]

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[31] [D.G.S.]. "On the sympathy of pendulums," *Cambridge Mathematical Journal* 2:9 (1840): 120–128; [G.S.]. "On the motion of a pendulum when its point of suspension is disturbed," *Cambridge Mathematical Journal* 2:11 (1841): 204–208. This problem became topical in the 1980s with the popularity of 'chaos'.

[32] Stray and Smith, *Gooden*, 124. Samuel Stephenson Greatheed married his cousin Margaret Stephenson in 1838.

[33] D.F. Gregory to S.S. Greatheed, 3 February 1839, TCL, Add.Ms.c.1/136.

[34] D.F. Gregory to S.S. Greatheed, 7 July 1839, TCL, Add.Ms.c.1/138. Greatheed had been highly active in publishing articles in volume 1 of the journal and after Gregory's prompt, two further articles for volume 2 were forthcoming. Afterwards, his contributions fell away, and, concentrating on hymnology as a pursuit, his church career took over.

4.3.1 Ellis's Juvenilia

Ellis's first publication in the *CMJ* occurred in the fifth number of the *CMJ*, when he was a third year undergraduate. The paper dealt with the popular topic of conic sections—on properties of the parabola, and the circumscribing hexagon and triangle. He was familiar with Pascal's hexagon theorem and the 'Hexagramme mystique' was a well-known subject amongst geometers of the day. He noted Colin Maclaurin's work and C. J. Brianchon's treatment of the dual result of sides of the hexagon meeting at a point. He cited G. P. Dandelin, and acknowledged T.S. Davies, the master geometer and his former teacher in Bath.

Ellis was critical of the proof given by John Lubbock in the previous year.[35] Lubbock had been at Trinity and graduated in 1825 (the same year as Challis). On leaving Cambridge he combined a career as banker and barrister with academic interests as a mathematician and astronomer, and he was an early worker in probability.[36] Ellis reported that Lubbock's method in demonstrating Brianchon's theorem was 'tedious, and not remarkable for symmetry and elegance, so that another proof is still desirable', and he duly gave one.[37] In doing this, he used an observation brought to light in the first number of the *CMJ* by Smith.

Ellis showed himself an analytical geometer in the spirit of treating geometry through the medium of algebra, believing, as he used to say, in letting the symbols do the work. But he was not dogmatic about this and he still took delight in results that could be proved by pure geometrical intuition and arguments given by the 'geometrical method'.[38]

Occasionally, mathematical notes supplied by Ellis appeared in the *CMJ*. If a mathematical method could be generally useful it became the material for a Note,

[35] Sir John William Lubbock (1803–1865). John W. Lubbock, "On a property of the conic sections" *Philosophical Magazine* 13:80 (July-December 1838), 83–86.

[36] See Stigler's chapter in this volume for an account of Ellis's work on probability theory. See also Lukas M. Verburgt, "Robert Leslie Ellis's work on philosophy of science and the foundations of probability theory," *Historia Mathematica* 40:4 (2013): 423–454.

[37] Robert Leslie Ellis, "On some properties of the parabola—Circumscribing hexagon and triangle," *Cambridge Mathematical Journal* 1:5 (1839): 204–208, on p. 225. Lubbock started with the standard equation of the straight line in x-y coordinates and showed by a long calculation that the three lines of Brianchon's theorem were concurrent.

[38] This was the case when he calculated the area under the arc of a cycloid by a geometrical insight *without* the employment of analytical geometry. See Robert Leslie Ellis, "On the area of the Cycloid," (Communicated by W. Walton 31 July 1854) *Cambridge and Dublin Mathematical Journal* 9 (1854): 263–264.

and this occurred in the writing of this first paper.[39] The proof of Brianchon's theorem hinged on a clever way of writing the equation of the tangent to a parabola.[40]

While Ellis's first paper was on pure mathematics he displayed all round interests by a paper written at the same time on mixed mathematics. He embarked on a practical application on the achromatism (the tendency of lenses to split white light into its constituent colours) that unwantedly occurrence in the eyepieces of telescopes. Airy had read a paper on this before the Cambridge Philosophical Society as an undergraduate, and in his paper, Ellis sought to simplify Airy' argument.[41]

With these juvenilia Ellis gained his publishing spurs. The material presented may not have been an important event for mathematics, or for practical application either, but they were important to *him*. He became a regular contributor to the *CMJ* in the 1840s.

4.3.2 Algebra and Geometry

From among the first topics learned by the boy in Bath, the solution of quadratic and cubic equations gave him great pleasure. Now, as an undergraduate, this enthusiasm was transferred to a paper on the squares of the differences of roots of a polynomial equation, and this put him in touch with the work of the eighteenth-century Edward Waring and Joseph-Louis Lagrange. In this contribution to the *CMJ*, he probed Sturm's Theorem on counting the number of real of roots of a polynomial lying between determined limits.[42]

Later on, when a Fellow, Ellis considered the nature of equations and the commonly experienced two types of equation: *algebraic* equations where it is required to find an unknown *quantity* and *functional* equations where it is required to find an unknown *function*. Into the former category fell the ordinary polynomial equations

[39] Robert Leslie Ellis, "Mathematical Notes 1. 'On a harmonic property' and 'On some properties of the parabola [Signed ϵ.]," *Cambridge Mathematical Journal* 2:7 (1839): 47–48. Ellis derived his method used in a paper by Smith (in Archibald Smith. "On the equation to the tangent of the Ellipse," *Cambridge Mathematical Journal* 1:1 (1837): 9–12). He used a now common place technique in analytical geometry.

[40] For the parabola in the form $y^2 = 4ax$ a tangent line can written in the form $y = x/\beta + \beta a$ where β is the tangent of the angle the line makes with the y (*vertical*) axis. With this set-up, the intersection of two tangent lines at P_1 and P_2 on the parabola meet at the point P with x-y coordinates $(a\beta_1\beta_2, a(\beta_1 + \beta_2))$.

[41] Airy treated the case where one kind of glass was used. George B. Airy, "On the use of silvered glass for the mirrors of reflecting telescopes (Read 25 November 1822)," *Transactions of the Cambridge Philosophical Society* 2 (1827): 105–118.

[42] Robert Leslie Ellis, "On the existence of a relation among the coefficients of the equation of the squares of the differences of the roots of an equation," *Cambridge Mathematical Journal* 1:6 (1839): 256–259. (Not listed in *Royal Society Catalogue of Scientific Papers*). Once again this is an instance of boyhood studies indicating future work. Just before going to Cambridge he had written in his diary: 'Studied Sturm's rule' (4 May 1836).

and into the latter differential equations. Here Ellis entered the 'science of symbols' debate, the division between arithmetical algebra and symbolic algebra written about by Peacock. Ellis actually argued against the distinction since, even with an arithmetical equation like a quadratic $x^2 + bx + c = 0$ where ostensibly we seek an unknown quantity x, but are really finding it (via the quadratic formula) as a *function* of the coefficients *b, c*. [43]

Following his degree Ellis set to work on three-dimensional geometrical problems. Here we remember the tuition given to him by Davies who specialized in the geometry of three dimensions. Now to be investigated was a study of lines of curvature on an ellipsoid. This was a problem pursued analytically where the guiding principle was to make the most of an equation's symmetry.[44] In his paper he noted the appearance of the problem in the textbook presentations given by C. F. A. Leroy and by John Hymers.[45]

Ellis showed his attachment to the analytical geometrical method when he proved Matthew Stewart's suite of geometrical theorems. Enunciated by the Scot in 1746, there were no fewer than eight geometrical theorems concerned with regular polygons inscribing and circumscribing a circle. For example, if a regular n-gon (a convex polygon with n equal sides) circumscribes a circle of radius r and p represents the distance to its sides from an arbitrary point on the circumference, the theorem states that $2 \sum p^3 = 5nr^3$. Various other theorems arise by letting the point P be a general point in the plane and others by considering n-gons inscribed in a circle.

Matthew Stewart worked with Robert Simson in Glasgow. He also worked with Colin Maclaurin in Edinburgh before succeeding him in 1747 as professor. Just how he arrived at the theorems was somewhat mysterious and Ellis sensed this. In 1805, another Scot, James Glenie, proved the theorems. At the time, he was employed by the East India Company Military College at Addiscombe (South London). Glenie gave a geometrical proof, which led John Playfair to ask for an analytical one as being more desirable.[46] Ellis set and proved an overarching Lemma concerning a general polynomial expressed in trigonometric sines and cosines from which *all* the

[43] Robert Leslie Ellis, "Remarks on the distinction between algebraical and functional equations," *Cambridge Mathematical Journal* 3:14 (1842): 92–94.

[44] The *symmetry* of the equation was important in this proof of Dupin's theorem (that three families of orthogonal surfaces intersect along their lines of curvature). In 1873, Cayley used equations derived by Ellis (published in Duncan Farquharson Gregory. *Examples of the Processes of the Differential and Integral Calculus* (Cambridge, 1841)). Charles Dupin (1784–1873) published the theorem in 1813. The theorem and the study of the ellipsoid was a popular one in Cambridge. See, for example, Thomson, William (signed "P.Q.R."), "Elementary demonstration of Dupin's Theorem," *Cambridge Mathematical Journal* 4:20 (1844): 62–64.

[45] Charles F. A. Leroy. *Analyse appliquée a la géométrie des trois dimensions* (Paris, 1835); John Hymers. *A Treatise on Analytical Geometry of Three Dimensions*. 2nd edition (Cambridge, 1836), 257.

[46] Mathew Stewart (1717–1785) was the father of philosopher Dugald Stewart. James Glenie (1750–1817) was a soldier involved in the American War of Independence. After the War he was briefly appointed at Addiscombe (in South London). His proof of Stewart's theorems for regular n-gons ($n > 3$) in 1805 was published in the *Edinburgh Transactions*.

theorems could be deduced. He briefly mentioned that there was no limit to the kind of 'Stewart theorems', which could be generated, and that other curves (such as the ellipse) might also be considered.[47]

4.3.3 Differential Equations and Multiple Integrals

Integration problems arose in the Tripos in the 1830s, a direct result of the curriculum being enlarged. Prominent in this was William Whewell who strove for utility in the mathematics being taught at Cambridge. Such topics in mathematical physics, as the theory of electricity and the 'Figure of the Earth' question became important. A leading textbook that supported the drive to utility was the compendious *Mathematical Principles of Mechanical Philosophy* by John Pratt that appeared in 1836 with a Second Edition in 1842.[48]

Interest in the field of differential equations was encouraged at Cambridge, by the need to solve problems in 'mixed [applied] mathematics.' At the theoretical level, Ellis drew on the Calculus of Functions as outlined by Charles Babbage in the 1810s.[49] While waiting to go to Cambridge, Ellis had read Babbage on the subject at the Bath Institution and thought him 'profound' (9 April 1836). Differential equations required an 'integration' process, being the inverse operation to that of 'differentiation'. As a mark of its changed status the subject of Calculus was split into 'Differential Calculus' and 'Integral Calculus' in the nineteenth century.

Cambridge mathematicians Alexander. J. Ellis (no relation), Thomas Gaskin, Greatheed, and Ellis were all involved with developing techniques for the solution of differential equations.[50] In contrast, the Irish mathematician Robert Murphy and Gregory focused on foundational issues and the theoretical validity of the differentiation D operator method of solving such equations. Their researches used symbolic methods of the Calculus (stemming from Lagrange's algebraically based

[47] It is notable that Ellis's former teacher T. S. Davies involved himself with Stewart's theorems and submitted his research 26 March 1846. See Thomas S. Davies, "Analytical investigation of two of Dr Stewart's general theorems," *Cambridge and Dublin Mathematical Journal* 1 (1846): 228–238.

[48] John H. Pratt. *The Mathematical Principles of Mechanical Philosophy and Their Application to Elementary Mechanics and Architecture: But Chiefly to the Theory of Universal Gravitation* (Cambridge: J. and J.J. Deighton, [1836] 1842). In the second edition, the book contained 620 pages, including chapters on Potential Theory, the Pendulum (where elliptic functions were mentioned), Lunar Theory, and the Shape of the Earth (including Clairaut's Theorem). Pratt was a student of William Hopkins and was Third Wrangler in 1833. In 1838, he went to India and was appointed Archdeacon of Calcultta.

[49] Charles Babbage, "An essay towards the calculus of functions II," *Philosophical Transactions of the Royal Society of London*, 106 (1816), 179–256. Ellis discovered an error (p. 253) in Babbage's reasoning (see Ellis's diary entry for 22 March 1842) and he outlined the gap in Robert Leslie Ellis, "On the solution of functional differential equations," *Cambridge Mathematical Journal* 3:15 (1842): 131–138.

[50] Thomas Gaskin (1810–1887) is somewhat unique in Mathematical Tripos history. He was Moderator on six occasions (1835, 1839, 1840 1842, 1842, 1848, and 1851) but he never acted in the subsidiary role of Examiner.

Calculus avoiding the notions of infinitesimals and limits). Thus, the Calculus of Operations became popular and was much written about.[51]

The 'Figure of the Earth' problem was regarded as one in hydrodynamics where the Earth is considered as a rotating fluid acted upon by its own gravitational forces.[52] The researches of Alexis Clairaut, Jean le Rond d'Alembert, and Euler were the first group of mathematicians to deal with problems stemming from Newton's *Principia* (1687) and his conjectures on the shape of the Earth.[53] Clairaut's theorem posited the shape in terms of a mathematical formula, and this solution was topical when Ellis was at Cambridge, and it had appeared in Pratt's *Mathematical Principles*. In the summer of 1840, while reading Newton's lunar theory, Ellis wrote in his diary: 'The nature of Clairaut's Theorem struck me more clearly than it ever did before' (23 August 1840).

Laplace's *Méchanique céleste*, a five-volume work (1799–1825), was the culmination of the next group of mathematicians to address the 'Figure of the Earth' question. While Laplace gave a solution to the differential equation, he gave it without explaining his method. This gap attracted the Cambridge mathematicians of the 1830s. Thomas Gaskin the Moderator for the Mathematical Tripos in 1839 based a question on it that year.[54]

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[51] The Calculus of Operations had the merit of brevity, symmetry and a unity in procedures, where $D \equiv \frac{d}{dx}$ the D differentiation operator.

[52] Henk J. M. Bos, *Lectures in the History of Mathematics* (American Mathematical Society & London Mathematical Society, 1993), 117–118. As an undergraduate Ellis contributed a paper on Attraction and the Figure of the Earth. See Robert Leslie Ellis, "On the condition of equilibrium of a system of mutually attractive fluid particles," *Cambridge Mathematical Journal* 2:7 (1839): 18–22. This was noted by Isaac Todhunter in his history of the subject, but in listing 34 *principal* writers on this question Ellis was not among them. See Isaac Todhunter, *History of Mathematical Theories of Attraction and the Figure of the Earth, from the time of Newton to that of Laplace.* 2 vols. (London: MacMillan, 1873), in volume 1, xxxv, and volume 2, 395.

[53] Alexis Clairaut (1713–1765), F.R.S., a Paris-based mathematician published *Theorie de la figure de la terre tirée des principles de l'hydrostaque* (1743), and work published in the *Philosophical Transactions of the Royal Society* (1737–1738, in Latin with an English translation). The subject was a live issue in the Cambridge in the 1840s. G. G. Stokes verified Clairaut's results in 1849. G.G. Stokes, "On the attraction and on Clairaut's Theorem," *Cambridge and Dublin Mathematical Journal* 4 (1849): 194–219.

[54] The Figure of the Earth question was dealt with in John Hymers. *Treatise on Differential Equations, and on Calculus of Finite Differences* (Cambridge, 1839), 83. Ellis's work was recognized by Boole in his Royal Society's Gold Medal winning 'On the general method of analysis', and much later in an influential paper (James W.L. Glaisher, "On Riccati's equation and its transformations, and on definite integrals which satisfy them," *Philosophical Transactions of the Royal Society* 172 (1881), 759–811). Ellis's work is explained in Augustus De Morgan, *Differential and Integral Calculus* (London: Baldwin and Cradock, 1842), 693–694, 700–703. The differential equation known to the British mathematicians as Riccati's equation differs from the generally accepted modern Riccati equation (as a first order equation of the form $\frac{dy}{dx} = A(x)y^2 + B(x)y + C(x)$).

Beginning with a pressure/density assumption, the ellipticity of the surface of the earth can be deduced from a differential equation, an equation not easily solved.[55] In his *Diary* of 1840 Ellis wrote: 'I got a method of integrating the equation—which occurs in the figure of the earth. I had one yesterday, which was not good.' In the next two days he was happier, writing that he had worked successfully at the equation and had found an extension to the method.[56] He gave a series solution for a wider class of equations (but ones of the same form), and secondly, a solution based on trigonometric functions.

A major paper in the methods whereby linear differential equations could be solved in general was about to be published, and this came from outside the Cambridge circle, from George Boole. In 1844 Boole, who became a well-known mathematician, was at the time an impoverished schoolteacher from Lincoln. He achieved the distinction of being awarded a Royal Society Gold Medal for his paper 'On a General Method in Analysis.'

Boole noted the 'figure of the earth' equation and wrote of Ellis's research: 'Equations of the above class have been discussed by Mr. LESLIE ELLIS, in two very ingenious papers published in the Cambridge Mathematical Journal, and it is just to observe that the first conceptions of the theory developed [here], were in some degree aided by the study of his researches.'[57] Ellis and Gaskin had achieved partial success but Boole's 'New Method', using the familiar D operator effectively showed how a wider class of differential equations could be solved.[58]

Ellis was known in his lifetime for his work on differential equations.[59] The first paper he published as a Fellow of Trinity was on the 'tautochrone in a resisting medium' a topic treatable by solving a differential equation. He had worked on the problem in the Summer of 1840 before the impending Fellowship examinations and wrote in his *Diary*: 'I got today a remarkably simple demonstration of the tautochrone, when the medium resists as the square of the velocity—a difficult problem

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[55] The differential equation $\frac{d^2y}{dx^2} + q^2 y = \frac{6y}{x^2}$ was treated by in George B. Airy, *Mathematical Tracts on Physical Astronomy, The Figure of the Earth* (Cambridge: Deighton, Bell & Co., 1839). Designed for Cambridge students, it treats the equation on pp. 107–108. The Figure of the Earth question was treated by Laplace in 1819, and his methods are given in Pierre-Simon Laplace. *Traité de Méchanique Céleste*. Vol. 5. Book 11 ('On the figure and rotation of the Earth') (Paris: Bachelier, 1825). For a discussion of the specific differential equation as it appeared in Laplace see Ivor Grattan-Guinness, *Convolutions in French Mathematics, 1800–1840*. 3 vols. (Basel, Boston & Berlin: Birkhäuser, 1990, in vol. 2, pp. 826–827).

[56] Ellis worked on this problem after he had sat the Tripos Examination (see diary entries for 8–11 July 1840).

[57] Robert Leslie Ellis, "On the integration of certain differential equations Part I," *Cambridge Mathematical Journal* 2:10 (1840): 169–177. 1841; and Part 2. *Cambridge Mathematical Journal* 2:11 (1841): 193–201. George Boole, "On the general method of analysis," *Philosophical Transactions of the Royal Society* 134 (1844): 225–282, on pp. 250–252.

[58] Desmond MacHale, *George Boole: His Life and Work* (Dublin: Boole Press, 1985), 62. Boole went on to publish *A Treatise on Differential Equations* (1859).

[59] Differential equations was a subject for which Ellis gained his mathematical reputation in the historical line Gaskin-Ellis-Boole, and later J. W. L. Glaisher.

as ordinarily treated' (23 July 1840).[60] To Ellis it had been dealt with by Laplace but unsatisfactorily. Ellis took the resistance $R = hv + kv^2$ where v is velocity, and developed the solution by solving a second order differential equation.[61]

Ellis applied himself to problems associated with chronometers. He cited the firm of Arnold and Dent, whose premises he visited on trips to London. This firm was well known for their manufacture of chronometers, and Astronomer Royal George Biddell Airy recommended them. In this work, Ellis concerned himself with the solution of the 'pendulum equation' as applicable to the Chronometer.[62]

In further problems in the Integral Calculus, the subject of *multiple integrals* was broached. It attracted a flurry of interest both in France and in England from Dirichlet, Liouville, Cayley, Thomson, Boole, George Green, G. G. Stokes, and Ellis. Single integrals can be used to measure the length of a curve or the area beneath a curve but double, triple, integrals, and multiple integrals can be used (amongst other things), to measure volume.[63]

Peter Gustav Lejeune-Dirichlet led the way with a process for evaluating multiple integrals. To Boole, Dirichlet's process of integration was perhaps 'the most remarkable that has ever been published.'[64] Dirichlet's proof did much to cement his reputation as a significant mathematician.[65] An application of the result, for example, determined the volume of an n-ball in terms of gamma functions. Joseph Liouville extended Dirichlet's theorem (now known simply as 'Liouville's extension'), by introducing a function F into the integrand. The combined work of Dirichlet and Liouville is applicable to potential theory (concerned with the attractive force of an ellipsoid upon an external point).

In England, there were several investigators of multiple integrals. Of Trinity mathematicians, Cayley was attracted to the subject while still an undergraduate. Independently Ellis made use of discontinuous functions and using Fourier's

[60] Robert Leslie Ellis, "On the tautochrone in a resisting medium," *Cambridge Mathematical Journal* 2:10 (1840): 153–154. The tautochrone problem in a resisting medium was treated by Johann I. Bernoulli (1667–1748) and Alexis Fontaine (1701–1771). As a boy Ellis read Rev. Samuel Vince's textbooks but Vince was also a respected scientist who made his name with the resistance of bodies moving in fluids. Samuel Vince, "Observations on the theory of the motion and resistance of fluids; with a description of the construction of experiments, in order to obtain some fundamental principles," *Transactions of the Royal Society*, 85 (1795): 24–85, and 88 (1798): 1–14.

[61] Ellis later sent a brief tautochrone paper to William Walton and it was published in William Walton, *A Collection of Problems in Illustration of Elementary Mechanics* (Cambridge: Deighton, Bell & Co., 1858), 245.

[62] The equation is $\frac{d^2y}{dt^2} + \frac{e\theta}{I} = 0$ where e depends on the elasticity of the spring and the temperature, and I is its moment of inertia. Robert Leslie Ellis, "On the balance of the Chronometer," *Cambridge Mathematical Journal* 4:21 (1844): 133–137. Ellis hoped to return to this problem but it does not appear that he did.

[63] J. J. Cross, "Integral theorems in Cambridge mathematical physics 1830–1855," in P.M. Harman, ed. *Wranglers and Physicists: Studies on Cambridge Physics in the Nineteenth Century* (Manchester: Manchester University Press, 1985): 112–148.

[64] George Boole, "On a certain multiple integral," *Transactions of the Royal Irish Academy* 21 (1846): 140–149, on p. 140.

[65] Johann P.G. Lejeune-Dirichlet, "Sur une nouvelle méthode pour la determination des Intégrales multiples," *Journal de Mathématiques Pure et Appliquées* 4 (1844): 164–168.

[Integral] theorem for periodic functions.[66] According to Boole this 'led to some elegant results, which M. Dirichlet's process would fail to discover.'[67] This material formed the only paper Ellis wrote for a foreign journal.[68]

In his own modest way, Boole wrote to Thomson about Ellis's work on multiple integrals: 'will you ask him whether he is quite satisfied with the way in which I have spoken of him, or rather (as there is but one way in which it is possible to speak of Mr Ellis) whether he thinks I have claimed more originality than is my due to the prejudice of his own claims & those of Dirichlet. On reading over the proofs it appears to me, I confess, that it might have been more just to speak of my method as a combination of theirs, but it did not appear so at the time I wrote the paper.'[69]

When Boole applied for the professorship in Cork, Ellis wrote of the pleasure he had in recommending him. His endorsement was well measured, and he wrote of Boole that his 'conversation bears manifest traces of varied and original talent and of a mind at once active and well cultivated.'[70] This feeling was reciprocated, and to Boole, Ellis was true friend.[71]

4.3.4 Editorship

When Gregory became ill in 1843, he returned to Edinburgh. He continued as editor of the *CMJ* but understandably the process was becoming more difficult. After the appearance of the November number in that year it was proving an insuperable burden, and Ellis took over as emergency editor assisted by his friend William Walton, with support from Cayley.

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[66] In modern notation for a periodic function, Fourier's theorem is written $f(x)=\frac{1}{\pi}\int_{\alpha=0}^{\infty}\int_{u=-\infty}^{\infty} f(u)\cos\alpha(x-u)\,du\,d\alpha$. For the sequence of papers relating to this subject see: Robert Leslie Ellis [Signed ϵ.], "On the evaluation of definite multiple integrals," *Cambridge Mathematical Journal* 4:19 (1843): 1–7; Robert Leslie Ellis, "Note on the definite multiple integral," *Cambridge Mathematical Journal* 4:20 (1844): 64–66; Robert Leslie Ellis, "On a multiple definite integral," *Cambridge Mathematical Journal* 4:21 (1844): 116–119; Robert Leslie Ellis, "Sur les intégrales aux différences finies," *Journal de Mathématiques Pures et Appliquées* 9 (1844): 422–434; Robert Leslie Ellis, "General theorems on multiple integrals," *Cambridge and Dublin Mathematical Journal* 1 (1846): 1–10.

[67] George Boole, "On a certain multiple definite integral (Read 13 April 1846)," *Transactions of the Royal Irish Academy* 21 (1846): 140–149.

[68] See Ellis, "Sur les intégrales aux différences finies." In this paper, Ellis referred to material presented earlier, in Robert Leslie Ellis, "On a multiple definite integral," *Cambridge Mathematical Journal* 4: 21 (1844): 116–119.

[69] George Boole to William Thomson, [15?] September 1846, CUL, Kelvin Collection, Ms. 7342.B154.

[70] MacHale, *Boole*, 78.

[71] No doubt Boole and Ellis had met in person at the British Association Meeting held at Cambridge in 1845. See Desmond MacHale and Yvonne Cohen, *New Light on George Boole* (Cork: Attrium Press, 2018), 315.

In January 1844 Ellis was finding it difficult to attract articles for the forthcoming number in February. He introduced himself to Boole by letter in the hope of getting something from him: 'There appears to be some difficulty in filling up the forthcoming number of the *Journal'*, he wrote, 'I have therefore ventured to address myself to you and to express my hope that you will be willing not only to relieve us from our embarrassment, but also to give a higher character to the number than it would otherwise acquire, by contributing any fragment of your researches which may be readily detached from the general system… Mr Gregory, I regret to say, is detained by illness in Edinburgh; in his absence I have taken a share in the management of the *Journal*, which must be my apology for addressing you'.[72]

Boole supplied a paper 'On the Inverse Calculus of Definite Integrals' a paper already written which he could lift from the drawer.[73] Ellis could also call on his friends. Matthew O'Brien, his co-Moderator in 1844. A stalwart of the Cambridge Philosophical Society, O'Brien contributed 'On the Lunar theory' as the completion of a paper he had published earlier. Harvey Goodwin (an Examiner that year) contributed one on 'Light.' O'Brien and Goodwin were both from Gonville and Caius, the college next door. Ellis and William Walton supplied a paper each, as did Augustus De Morgan. William Thomson, in his third undergraduate year supplied two papers, one in pure mathematics (Dupin's Theorem), the other on 'Heat' both authored under the pseudonym P.Q.R.

From Edinburgh, Gregory kept a watchful eye on the *CMJ*, and when he died in February 1844 he was greatly missed. Ellis contributed a eulogy for his friend published in the *CMJ*. With all the sadness of his own life, he now wrote of how he would miss Gregory. He did this with all the sublime skill at his disposal. The Victorians are noted for their panegyrics, but this was not one. Resisting the temptation of speculating on 'what might have been', he closed: 'such speculations are necessarily too vague to find a place here; and even were it not so, it would perhaps be unwise to enter on a subject so full of sources of unavailing regret.'[74]

Ellis managed the May number in 1844 but gradually found the journal a chore. By the summer of 1844, barely six months of editing it, he was involving the young William Thomson in its running, and preparing the way for him to take over. Thomson was beginning his meteoric scientific career and was invigorated by the thought of being editor, writing to his father James Thomson, the professor of mathematics in Glasgow: 'We [Ellis and I] have been talking about a plan wh[ich] I

[72] Robert Leslie Ellis to George Boole, January 1844, Box 1, Rollett Collection, Lincolnshire Archive. MacHale and Cohen, *Boole*, 313–314.

[73] George Boole, "On the inverse calculus of definite integrals," *Cambridge Mathematical Journal* 4 (1844), 82–87, was the continuation of a previous paper, and is dated Lincoln, 26 October 1842. Boole hinted at some future work on Dirichlet's theory of multiple integration. For discussion of this paper see MacHale and Cohen, *Boole*, 314.

[74] Robert Leslie Ellis, "Memoir of the late D. F. Gregory, M. A. Fellow of Trinity College, Cambridge," *Cambridge Mathematical Journal* 4:22 (1844): 145–152, see p. 152. Ellis lost his eldest brother Henry William in March 1841, his father Francis in May 1842, and his brother Francis (Frank) in August 1843.

proposed for enlarging the Math'l Journal, so as to make it something of the nature of Liouville'e [Journal] if possible. […] I have been speaking to Cayley since, and he quite enters into the plan.'[75] But Thomson, like Gregory before him, was still an undergraduate and had to prepare himself for the Mathematical Tripos examination, an event that loomed for the January of 1845.

Ellis was an Examiner for the 1845 Tripos. Thomson was fully expecting to be the Senior Wrangler but unhappily was placed Second. He rectified the situation by winning the first Smith's Prize, in the next batch of examinations. Ellis congratulated him and played down the importance of the degree. Knowing Thomson wanted the Chair of Natural Philosophy in Glasgow Ellis wrote to him of the Smiths Prize papers he had sat: 'The papers were, I should think from the results, of a higher character than they have usually been. As the Smith has *ex professo* especial reference to natural philosophy, it will necessarily tell upon the minds of people in Glasgow more, one would be apt to believe, than the degree [which tested mathematics generally].'[76] Ellis had the highest regard for Thomson, remarking to a colleague, that 'we are just about fit to mend his pens.'[77]

When Thomson visited Paris after the Tripos, Ellis wrote to him: 'I should be much pleased if Bachelier [a Paris based publisher] would receive subscriptions for the Journal: which however is so dear that no Frenchman will buy it.' And he appealed for French authors, saying 'any contribution in French will be quite as acceptable as in English and that any accounts or aperçus of longer memoirs would be especially useful'.[78] One innovation Ellis brought in was the abandonment of the use of pseudonyms and from the May number of 1845 this took place.

Eventually Ellis wrote to Thomson, with the clear sense of wanting a decision on him taking over the editorship: 'I do wish you would permit me to resign the editorship in your favour—You will in all probability be longer in Cambridge than I shall, & I should be so much better pleased to see it in your hands than in mine. You know I only took it as a jury mast [a nautical term meaning a temporary makeshift spar] on Gregory's being obliged to give it up.'[79] After three months in France, Thomson was back in time for the British Association annual meeting about to begin in Cambridge. [80]

By this time, the outlook of the *CMJ* was changing. While the undergraduate contributors of the *CMJ* grew into maturity the focus became less on Tripos questions than on more substantial topics. Smith still saw the *CMJ* as primarily a vehicle

[75] William Thomson to his father James Thomson, 2 June 1844, CUL, Kelvin Collection, Ms. 7342.T264.

[76] Robert Leslie Ellis to William Thomson, [?] February 1845, CUL, Kelvin Collection, Ms. 7342.E52.

[77] Goodwin, "Biographical memoir," xix.

[78] Robert Leslie Ellis to William Thomson, 20 February 1845, CUL, Kelvin Collection, Ms. 7342. E53. Liouville and Chasles were favourably impressed by the journal.

[79] Robert Leslie Ellis to William Thomson, 13 June 1845, CUL, Kelvin Collection, Ms.7342.E55.

[80] The theme of the British Association meeting at Cambridge was 'Magnetism'. The meeting was held 23 June-2 July 1845. George Peacock had been President of the British Association for 1844. He was President of Section A (Mathematics) in 1845, James Challis was a Vice-President, and Harvey Goodwin a Secretary.

for undergraduate juvenilia, as he wrote to Thomson: 'The C.M.J. has hitherto been useful and successful and in the particular of stimulating men reading for and who have recently taken their degree to put into shape and preserve any thing pretty or ingenious which they hit on [and] it is probably more useful than a journal of a more general character would be.'[81]

Ellis was able to offer Thomson some useful advice, based on his own experience. He argued against Smith's idea that the journal was primarily a place for articles arising from Tripos study. On the thorny question of a change of name he wrote: 'my own impression has been that the journal has derived and would derive respectability from an appearance of connection with an academical body—such connection not being kept up in an exclusive spirit. … it must be remembered that the journal is growing up from youth to manhood and that what was true seven years ago is not true now.'[82]

Ellis travelled to Dublin, where he met Charles Graves. Graves was the youngest of three notable brothers educated at Trinity College Dublin—the others John and Robert Perceval. Before entering Trinity College Dublin, he had been prepared for at a clergyman's school in Westbury-on-Trym near Bristol in England, much the same as Ellis had gone to Challis's school in Papworth. In Dublin he became a star pupil gaining a scholarship in Classics, the gold medal in mathematics and enjoying the same academic success as his brothers. Originally a career in the army was intended but he gained a Dublin fellowship and this was followed by a professorship of mathematics.

Ellis reported back to Thomson on the meeting with Graves, that the introduction of 'Dublin' into the title of the journal would be welcomed: 'I dined with [Charles] Graves yesterday. He says many of the younger men tell him they would be happy to contribute if they could look on the journal as in any degree an organ of their university.'[83] Gaining William Rowan Hamilton as a contributor was a coup, and articles from the younger Irish mathematicians materialized. In the first volume of the *Cambridge and Dublin Mathematical Journal* for 1846 there were papers from John H. Jellett (aged 28), Samuel Haughton (aged 24) and Richard Townsend (aged 24).[84]

At last Ellis gained agreement from Thomson that he would take over the journal. There was an added complication that a change in publisher was being contemplated; a choice between the Cambridge based Elijah Johnson who had published the original *CMJ* and the up-and-coming firm of Macmillan. Macmillan, originally of Glasgow, then London, had taken over a bookshop at 1 Trinity St in 1846—on the same street as Johnson's premises. Ellis saw that Thomson was placed in an awkward position: 'I can quite understand that you find yourself disagreeably placed

[81] Archibald Smith to William Thomson, 16 July 1845, CUL, Kelvin Collection, Ms.7342.S145.

[82] Robert Leslie Ellis to Duncan F Gregory, 24 July 1845, CUL, Kelvin Collection, Ms.7342.E59.

[83] Robert Leslie Ellis to William Thomson, 17 July 1845, CUL, Kelvin Collection, Ms. 7342.E57.

[84] Charles Graves (1821–1899), John H. Jellett (1817–1888), Samuel Haughton (1821–1897) and Richard Townsend (1821–1884).

between the rival publishers—there can be no question as to your being quite at liberty to do that which suits you best—but it is not pleasant to bring two Christians into the tempers of wild cats, & to fill them full of envy, hatred & malice & all uncharitableness. I knew how it would be (as nurses say to children)—when you were so good as to take the journal off my hands, which would soon have wearied of holding the balance between Johnson & MacMillan.[85]

In recognition of Ellis's service to the *CMJ* Thomson proposed to publish an Ellis article as the opening article in the new *Cambridge and Dublin Mathematical Journal* to be published by Macmillan.[86]

4.4 The British Association, and After

Cambridge was the venue of the British Association Meeting in 1845, when many of the British attendees had taken the opportunity of returning to their *alma mater*. Magnetism was the theme of the meeting and this topic had formed the basis of Ellis's two papers of the previous year, when he calculated the resultant force on a magnetic particle distant from a small magnet. Gauss's friend Wilhelm Weber attributed the result to Gauss, and, using the Integral Calculus Ellis achieved an independent proof. [87]

Peacock was the retiring President of the British Association in 1845 handing over reins to Sir J. F. W. Herschel, but he had been in position when Reports for future meetings were being commissioned and announced at the 1845 meeting. Ellis was called upon to compose a Report on *Analysis*, as it applied to the theory of elliptic functions, and G. G. Stokes was to write one on *Hydrodynamics*. The requested reports also included one from Challis, on the *Present State of Astronomy* and from Peacock himself, a Report on *Analysis* as it related to the Theory of

[85] Robert Leslie Ellis to William Thomson. 26 July 1845, CUL, Kelvin Collection, Ms.7342.E60.

[86] Robert Leslie Ellis, "General theorems on multiple integrals," *Cambridge and Dublin Mathematical Journal* 1 (1846): 1–10. The *Cambridge and Dublin Mathematical Journal* first came out in January 1846.

[87] Robert Leslie Ellis, "Notes on magnetism I," *Cambridge Mathematical Journal* 4:20 (1844): 90–95, 139–143; Robert Leslie Ellis, "Notes on magnetism II," *Cambridge Mathematical Journal* 4:21 (1844): 139–143. Wilhelm E. Weber gives no reference to Gauss's work for this problem. See Wilhelm Weber. "On the arrangement and use of the bifilar magnetometer," Richard Taylor, ed. *Scientific Memoirs. Selected from the Transactions of Foreign Academies of Science and Learned Societies and from Foreign Journals*. 5 vols. (London: Richard and John E. Taylor, vol. 2, 1841), p. 270–272. For Ellis's result, AB is the magnet with midpoint c and magnetism M with P a distant particle with magnetism m. The length cQ is the projection of cP onto a line through the magnet. The resultant force R at P obeys an 'inverse cube' law: $R = \frac{PQ}{cQ}\left(\frac{Mm}{cP^3}\right)$.

Equations. Both young men, Ellis and Stokes, delivered their reports at the Southampton meeting the following year.[88]

Following graduation Ellis had kept up with Peacock, and visited him in Ely, where he was the Dean of Ely Cathedral. He wrote in his diary: 'we had a great deal of free talk on various subjects. He is I think a man of great ability, and largeness of view—& now as dean of Ely talked to me with less purpose and arrière pensée [afterthought] than he used to do as college tutor' (30 September 1840).

It was in recognition of Ellis as a competent mathematician, and a rising 'son of Cambridge', that he was entrusted with such a task as composing a Report. His appointment owes something to his connection with Peacock who knew him well, both as a student and a member of the Trinity Foundation. Peacock had written a report on the same subject himself in 1833 for the third meeting of the British Association when it last met in Cambridge.[89] Ellis's title dovetailed with this: *Report of the Recent Progress of Analysis Theory (Theory of the Comparison of Transcendentals)* so that it would be, in effect, a continuation of Peacock's earlier Report.[90]

4.4.1 Ellis's Report on Analysis

In composing his Report, Ellis relied on help from colleagues. He was in correspondence with the Rev. Brice Bronwyn, an Anglican cleric from Yorkshire who researched in geometry and astronomy as well as being an authority on elliptic functions.[91] He also received technical support from his friend Cayley: 'Mr Cayley,

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[88] Peacock was a leading figure in the British Association. He was President for 1844 and when he retired from this he became President of Section A (Mathematics Section) for 1845. British Association Reports were commissioned from Challis and Peacock in1845 but they were not forthcoming. Challis may have been overtaken by the Le Verrier/Adams Neptune controversy (1846) and Peacock with service on the University Reform Commission.

[89] George Peacock, *Report on the Recent Progress and Present State of certain Branches of Analysis. Report of the British Association for the Advancement of Science* (Third Annual Meeting, 1833, Cambridge) (London: John Murray, 1843), 185–352. At the 1845 meeting G.G. Stokes was commissioned to compose a Report on Hydrodynamics.

[90] Robert Leslie, *Recent Progress of Analysis Theory (Theory of the Comparison of Transcendentals). Report of the British Association for the Advancement of Science* (Sixteenth Annual Meeting, 1846, Southampton) (London: John Murray, 1847), 34–90.

[91] The Rev. Brice Bronwin (1786–1869) was born in Norfolk and served as curate in the parish of Denby Dale in West Yorkshire. See Tony Crilly, *Arthur Cayley: Mathematician Laureate of the Victorian Age* (Baltimore: Johns Hopkins University Press, 2006), 63–64. As editor, Ellis experienced frustration with Bronwin, writing: 'Was not Bronwin expressly invented for the purpose of vexing the editor of the mathematical journal?'. Robert Leslie Ellis to William Thomson, [?] February 1845, CUL, Kelvin Collection, Ms.7342.E52.

to whose kindness I have been, while engaged on the present report, greatly indebted, has communicated to me a demonstration of the truth of this equation.'[92]

The Report is a major piece of work, an account adding to the history of elliptic integrals and functions. To the audience in the 1840s it was meant to bring the theory up to date and introduce the revolution brought about by Niels Henrik Abel and Carl Gustave Jacob Jacobi, and it was intended as a springboard for future research. Ellis opened his Report, referring to the transformation of the subject that had recently taken place:

> The province of analysis, to which the theory of elliptic functions belongs, has within the last twenty years assumed a new aspect … in no other [subject] I think has our knowledge advanced so far beyond the limits to which it was not long since confined.[93]

And Ellis, the student of Francis Bacon took a different point of view from the famous philosopher. Bacon's maxim, that 'when knowledge is systemized it is less likely to increase than before', might apply to natural science, Ellis argued, but not to mathematics. This was manifestly the case in the theory of elliptic functions, he claimed, in which the systemized account had been given by Legendre.

The extensive history of the Elliptic Function Theory can be looked at in four phases.[94]

1. Particulars of elliptic integrals 1650–1750
2. Classification of elliptic integrals as an area of study 1750–1825
3. Elliptic functions 1825–75
4. Elliptic functions as part of abstract modern mathematics post 1875.

Ellis's Report is *part* of the third phase, the brief twenty-year period 1825–1845 when the revolution took place. He structured it in the form:

A. The general theory of algebraic integrals.
B. Investigations based on elliptic integrals, and within this,

    B(i) Elliptic function theory
    B(ii) Higher transcendentals.

In Ellis's writing the order of subjects took precedence over chronological order of their discovery.

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[92] Ellis, *Report*, 56. Cayley held the *Fundamenta Nova* in high regard. In his Report, Ellis noted that Cayley made use of Abel's doubly infinite products and that they were in reality elliptic functions. See *The Collected Mathematical Papers of Arthur Cayley*. 13 vols. (Cambridge: Cambridge University Press, vol. 1, 1889), 136–155, 156–182.

[93] Ellis, *Report*, 34.

[94] This periodization is given in Roger Cooke, "Elliptic integrals and functions," in Ivor Grattan-Guinness, ed. *Companion Encyclopedia of the History and philosophy of the Mathematical Sciences*. Volume 1 (London and New York: Routledge, 1994): 529–539. An exhibition in 1933 of books on elliptic functions was arranged to illustrate the growth of the theory in the nineteenth century. It consisted of 97 volumes. George N. Watson. "The Marquis and the Land Agent: A tale of the eighteenth century," *Mathematical Gazette* 17 (1933): 5–17.

Historically, the subject of elliptic functions can be explained in terms of *rectification*, that is, finding the length of a curve or a portion of it.[95] The result of applying the length formula of a curve is in many cases an integral of the form:

$$L = \int_x^0 \frac{dr}{\sqrt{1-r^k}}.$$

Measuring the arc of a circle, the simplest case, amounts to the case $k = 2$. By making the substitution $x = \sin\theta$ in this case we find $L = arc \sin x$ [96]

Applying the length formula to the 'Lemniscate of Bernoulli', a species of lemniscate investigated by Jacob Bernoulli (1694), we arrive at the case $k = 4$,the so called 'lemniscate integral'.[97] Ellis had worked on this curve as a seventeen-year-old, investigating its singular points and calculating its radius of curvature—declaring: 'The curve is exquisitely symmetrical, & I made use of this circumstance' (7 October 1834). The same type of integral is also arrived at for the ellipse, and for this reason the integral is called an elliptic integral (Fig. 4.1).

To evaluate the numerical value of this integral for specific values of x is to evaluate a *definite* integral. The integral with $k = 4$, which is emblematic of the whole theory, occurs in pendulum problems, and sundry geometrical problems. The general form of it, as studied by Niels Abel:

$$\int_x^0 \frac{dr}{\sqrt{\left(1-c^2r^2\right)\left(1+e^2r^2\right)}}.$$

The lemniscate integral is the special case $c = 1$, $e = 1$.

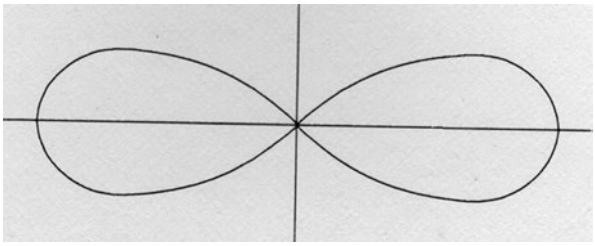

Fig. 4.1 The 'Lemniscate of Bernouilli'. (The diagram appeared in Bos, *Lectures*, 102. Abel saw the importance of the lemniscate. Its diagram was the only picture that occurred in his collected works. R. J. Wilson. *Newsletter of the European Mathematical Society* 45 (Sept. 2002): 7–9)

[95] For example, the perimeter of a whole cardioid with polar equation $r = 1 + \cos\theta$ is simply 8 but the answer for other curves is not so straightforward.

[96] In the case of a circle with equation $x^2 + y^2 = 1$. the length of arc is measured from the point (0,1) on the circle clockwise to (x, y) on the circle. For example, if $x = \frac{1}{2}$ then $L = \frac{\pi}{6}$.

[97] Bos, *Lectures*, 101–106.

A startling theorem due to Count Giulio Fagnano on the lemniscate curve (1714) can be regarded as the origin of elliptic function theory, a field of study, which attracted some of the most illustrious mathematicians, including the great Leonhard Euler.[98]

The entrance to the third phase of the history of elliptic functions, is where Ellis's Report really starts. The Abel/Jacobi revolution begins with the publication of A-M. Legendre's three volume *Traité des fonctions elliptiques* (1826–1830). This tome was the result of forty years' study—on the face of it designed to be the last word on the subject. The revolution of Abel/Jacobi showed that Legendre's work was only a part of the theory, and as Ellis put it: 'formed but a part, and not a large one, of the whole subject.'[99] The revolution was significant enough for the two mathematicians to share the Paris Academy Prize of 1830, an award generously engineered by the elderly Legendre. It was awarded posthumously to Abel who had died in 1829.

We have noted that the case of the circle $k = 2$ resulted in the function $L = arc \sin x$, the inverse of the trigonometric $x = \sin L$. For the case $k = 4$ there are an analogous set of 'higher' or 'transcendent functions' to the trigonometric *sine*, cosine, and tangent. Following the notation of Jacobi, these are the elliptic functions *sn*, *cn* and *dn*. They were found to have similar, but different, properties to trigonometric functions. By considering these elliptic functions, as Ellis observed, the field was enlarged far beyond that of calculating numerical definite integrals.

Where the integrand of the elliptic integral was of degree higher than $k = 4$, these transcendentals were called hyperelliptic integrals or Abelian integrals, a name in honour of Abel suggested by Jacobi. In citing these two mathematicians we are on the 'Royal Road' to Elliptic function theory comprising the dates (1825–1845) covered by Ellis's Report. They were almost sole travellers in the time interval we are considering.[100]

Ellis's object was to give an up-to-date state of the theory. In his 1833 Report, Peacock treated Abel's work on elliptic functions extensively and was admiring of his work, though he believed some of Abel's proofs were tentative. There was an important omission in Peacock's Report of 1833: a central result in elliptic function theory often referred to as Abel's Theorem. This, which gave a formula for the comparison of transcendentals, was published 12 years after Ellis's death, and so was not contained in Peacock's account.[101] Also missing from Peacock's Report was an

[98] Adrian Rice, "In search of the 'birthday' of elliptic functions," *Mathematical Intelligencer* 30 (2008): 48–56.

[99] Ellis, *Report*, 34.

[100] An account of C. G. J. Jacobi's pathway in elliptic function theory and the setting of the Jacobi-Abel rivalry is given in Roger Cooke, "C. G. J. Jacobi, Book on elliptic functions (1829)," in Ivor Grattan-Guinness, ed. *Landmark Writings in Western Mathematics 1640–1940* (Amsterdam: Elsevier, 2015): 412–430; Jeremy Gray, *The Real and the Complex: A History of Analysis in the 19th Century* (Cham: Springer, 2015).

[101] Niels Henrik Abel, "Mémoire sur une propriété générale d'une classe très étendue de fonctions transcendantes [Memoir on a general property of an extensive class of transcendentals], *Mémoire des Savants Étrangers* 7 ([1826] 1841): 176–264.

assessment of Jacobi's work. He gave Jacobi a name check but did not analyse his work.

Apart from Abel and Jacobi, Ellis covered the work of Scandinavian, Belgian, French, German, Irish, Russian Swiss, and British writers. It was a comprehensive report, noted for its clarity of exposition, and given in Ellis's lucid prose. Ellis noted two recent publications of William Henry Fox Talbot, published after Peacock's Report had been given.[102] Here he was in the role of 'theatre critic', never entering the field himself, and giving Talbot a withering assessment:

> These researches [of Talbot's] may be said to contain a development and generalization of the methods of Fagnani. They are however far more systematic than the writings of the Italian mathematician, and if they had appeared in the last century would have placed Mr Talbot among those by whom the boundaries of mathematical science have been enlarged. But it cannot be denied that they fall far short of what had been effected at the time they were published, nor does it appear that they contain anything of importance not known before.[103]

Fox Talbot won a Royal Society Gold Medal for these two papers, but Ellis questioned the high praise the papers had received—actually by none other than Peacock who had been called upon to judge the work.[104] Talbot admitted he had been anticipated by Abel—and (wisely) moved on to Photography. After all, like Ellis, he was a polymath and was in a position to do this.[105]

Abel died at the age of 26 years in April 1829 but Jacobi worked on. His *Fundamenta nova theoriae functionum ellipticarum* published in 1829, written in Latin, became a landmark. Interestingly Ellis contrasted the styles of Abel and Jacobi:

> In M. Jacobi's we meet perpetually with the traces of patient and philosophical induction; we observe a frequent reference to particular cases and a most just and accurate perception of analogy. Abel's are distinguished by great facility of manner, which seems to result from his power of bringing different classes of mathematical ideas into relation with each other, and by the scientific character of his method. We meet in his works with nothing tentative, with but little even that seems like artifice. He delights in setting out with the most general conception of a problem, and in introducing successively the various conditions and limitations which it may require.[106]

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[102] Henry Fox Talbot, "Researches in the integral calculus. Parts 1 & 2," *Philosophical Transactions of the Royal Society* 126 (1836): 177–215, 127 (1837): 1–18.

[103] Ellis, *Report*, 41.

[104] June Barrow-Green, "'Merely a Speculation of the Mind?'," in Mirjam Brisius, Katrina Dean and Chitra Ramalingam, eds. *William Fox Talbot: Beyond Photography* (New Haven & London: Yale Center for British Art, 2013): 67–94.

[105] Henry Fox Talbot (1800–1877) was a talented mathematician and is remembered in mathematics for Talbot's curve. He gained entry to the Royal Society on the basis of mathematics, and though he is now known for his work in photography, his was a lifelong attachment to mathematics.

[106] Ellis, *Report*, 57.

In his Report Ellis included the work of Jacobi's two students who worked in the area of elliptic functions Friedrich Richelot and Johann Rosenhain.[107]

Ellis's Report made few waves. The intrinsic difficulty of presenting the material led an otherwise appreciative James Forbes to conclude that it was important, but that 'Specimens of what a history of pure mathematics would be, and must be, are to be found in the able "Reports" of Dr Peacock and Mr Leslie Ellis, in the *Transactions of the British Association* for 1833, and 1846. A glance at these profound and very technical essays will shew the impossibility of a popular mode of treatment, while the difficulty and labour of producing such summaries may be argued from their rarity in this or any other language.'[108]

Following the publication of Ellis's Report, the theory itself was subject to a further revolution as a new wave of mathematicians became active in the area, notably Charles Hermite and Gotthold Eisenstein. Following them, but into the 1860s, appeared the ground-breaking research of Karl Weierstrass and Bernhard Riemann.[109]

As said, the 1846 Report by Ellis was a major piece of work. But in his own life it was a watershed for its author. A short while after submitting it he thought of giving up mathematics altogether and specializing in the Law. After a dalliance with the possibility in his youth, he once more entertained earlier thoughts of a law career. The Regius Professorship of Civil Law at Cambridge became vacant in 1847 and the question arose: would he have a chance of being appointed? This prospect became a source of rumour at Cambridge. It seemed like an abrupt change of direction, but Ellis was not narrowly focused on mathematics. He had been called to the Bar as a twenty-year old but might he now join the law profession? It was a profession that had attracted many able people with mathematical training, and the two activities were thought to require a core of similar skills. The opportunity played on his mind, writing to his sister that such an appointment 'has been a dream of mine for years.' Unfortunately, it did not happen.[110]

In 1849 Ellis had to give up his Trinity Fellowship, the seven-year term having expired. Being independently wealthy this severance created little difficulty as

[107] Friedrich Julius Richelot (1808–1875) and Johann Rosenhain (1816–1887) were students of Jacobi.

[108] Todhunter, *History of Mathematical Theories*, xviii.

[109] The principal British workers in elliptic function theory were A. Cayley, H.J.S. Smith, and J.W.L. Glaisher. By the end of the nineteenth century the subject had changed from the one addressed by Ellis. While Cayley's research is noted, Ellis's Report is not cited in Robert Fricke's history of elliptic function theory in Robert Fricke, "Elliptische Funktionen," in *Encyklopädie der Mathematischen Wissenschaften. Band 2, Teil 2* (Leipzig: B. G. Teubner. 1901–1921), II B3: 177–348.

[110] Henry James Sumner Maine (1822–1888) was appointed as Regius professor of Civil Law in 1847. Maine is an example of a student qualifying for the right to enter for the Classics Tripos by first gaining a place in the Mathematical Tripos. In 1844 he was placed 111th in the Mathematical Tripos list but became the 'Senior Classic', the top student in the Classical Tripos examination. (Maine was a friend of Francis Galton who spoke favourably of Maine's intellectual gifts). Robert Leslie Ellis to his sister Lady Affleck, 7 February 1847, TCL, Add.Ms.a.81.73.

regards income; he had no need of a share of the Trinity Dividend. He carried on with academic study, and as he did, the titles of his later papers became more diverse indicating both a lack of focus on technical mathematics and a work reflecting the breadth of his interests.[111] Unhappily, around this time his health went into serious decline.

In 1854, Boole wrote to Thomson, aware that Ellis was gravely ill: 'I had a brief melancholy note in the early part of the year from Mr Ellis', he wrote further: 'Can you tell me if he is now living? What a loss to the higher walks of science his long illness &, I suppose I may now add, too early removal from this scene of things have proved. I scarcely think it possible from what he said in his note, written by the hand of another, that he still feels the load of mortality. When I look at his few papers on mathematical subjects they seem to me to show more at once of the refinement & the power of genius than anything of the kind that has appeared in modern times.'[112]

Robert Leslie Ellis died in May 1859.

4.5 Epilogue

From youth Robert Leslie Ellis was aware of his ability in mathematics. He was also reflective and topics explored in childhood remained with him, and frequently informed his mathematical papers. Rejecting mathematics as competition, Ellis reacted strongly against being driven, a prevailing attitude that existed in the years when he might have been even more productive.

This attitude emerged quite early; at the time of his entry to Cambridge he even began to cast doubt on the usefulness of his home tutor T. S. Davies. He had learned much from Davies, though he was a strict teacher insisting on thorough preparation ahead of lessons—and perhaps this coloured Ellis's disparaging remarks. Davies was a superb geometer who was alive to the history of mathematics, as well as the work of the great European mathematicians. Yet in rare moments, and on the eve of his going to Cambridge, Ellis discounted Davies's influence and wondered whether his teacher had been a positive help, writing: 'if I ever influence any one's mathematical education—there shall be no teaching—no jockeying, getting on of the pupil. He shall be left to himself, after the first rudiments—Had this been my case, I had now been a mathematician—for I have fair abilities' (21 July 1834).[113]

[111] The *Works of Francis Bacon* was first published by Longman 1857–1859. Ellis took on the part dealing with Bacon's philosophy. See Verburgt's chapter in the present volume for a discussion.

[112] George Boole to William Thomson, 29 December 1854, CUL, Kelvin Collection, Ms. 7342.B175.

[113] Ellis and T.S. Davies came to have an uneasy relationship. On one occasion Ellis considered that too much was demanded of him and wrote in his diary of sending back the work 'intact. I wonder how he will take my doing so; but people who will not take hints must by snubbed occasionally, to keep them in any tolerable order' (3 February 1834).

Ellis developed his own philosophy of how mathematics should be understood and valued.

When Ellis was at Cambridge this attitude towards mathematics carried over to the Tripos competition and it caused him to despise the whole system in existence there. He was rescued by his private coach William Hopkins, employed in his final undergraduate year, a man who aimed at 'understanding' rather than 'cram'.

Even if Ellis adopted a leisurely approach to mathematics, you could never accuse him of conducting research with 'one foot on the fender.' But he was no mere mathematician (as the expression went) instead of limiting himself to mathematics he branched out. He read widely in all kinds of subjects within and without mathematics. Such diversions may have detracted from a purely mathematical career but were invaluable in his role as emergency editor of the *CMJ*.

A mathematician can make connections with almost any branch of mathematics, though following Ellis's death it was suggested by a commentator that the majority of his mathematical papers, were 'mostly devoted to the solution of isolated questions.'[114] The 'isolated questions' were in fact generated from a single thread, often leading back to questions in the Calculus, Differential Equations, Analytical geometry, and Probability. His choice of topics were frequently made in response to subjects tied to the Mathematical Tripos and his works largely Cambridge based, published in the *CMJ*, the *Transactions of the Cambridge Philosophical Society*, and while he was still in good health, to the *Cambridge and Dublin Mathematical Journal*.

The *Journal de Mathématiques Pure et Appliquées* (Liouville's journal, 1844) Volume 9 is a place where we can see Ellis's career in comparison with others. It was in this volume that three young mathematicians of Cambridge, William Thomson, Arthur Cayley and Ellis made their international début. Thomson wrote a note on the theory of attraction, Cayley on curves of the third order, and Ellis on multiple integrals. Unlike Thomson and Cayley, who took these papers as a signal of more to follow, Ellis's paper was the only one he published in that journal or in any European journal.

The mutual differences within this triumvirate were quite different in the way they conducted their intellectual forays, and these disparities throw some light on the way Ellis lived his scientific life. Between Thomson and Cayley there was a clear line of separation. Thomson was to fix his attention on the application of mathematics, and did not shy away from making money from his work. He wrote of Cayley's pure mathematical research as 'pieces of algebra which possibly interest four people in the world.'[115] Cayley was a pure mathematician by inclination—on an

[114] Anonymous. [James D. Forbes], "Robert Leslie Ellis," *The Athenaeum* 1685 (11 February 1864): 205–206.

[115] William Thomson to Hermann L. F. von Helmholtz, 31 July 1864, in Silvanus P. Thompson, *Life of William Thomson, Baron Kelvin of Largs* (London: Macmillan, 1910), in vol. 1, 433.

early occasion rejecting Physical Optics as a research topic once writing to Boole of his 'remaining tolerably constant to linear transformations.'[116]

Perhaps the more fruitful comparison is between Cayley and Ellis, friends from the early 1840s, and both inclined towards pure mathematics. Cayley was in a hurry. Ellis wasn't. Cayley was single-minded. Ellis wasn't. In his life, Ellis produced forty papers mostly published locally in Cambridge, yet Cayley had surpassed this total by 1846, and published both in France and Germany, even before he had left Cambridge for employment in the Law.

An interest they shared was in the field of Elliptic Functions. Ellis had completed his survey in 1846 and for Cayley the field was a lifelong interest and the subject of his only book, published in 1876.[117] Surprisingly Cayley's book makes no mention of Ellis's Report, nor is there any reference to it in his *Collected Mathematical Papers* of thirteen volumes.

Ellis's 1846 Report was effectively shelved. Cayley's student J. W. L. Glaisher, a later Cambridge mathematical Don, took up the mantle of Elliptic Functions in the final quarter of the nineteenth century, but from the date Ellis's Report was published until 1871 when Glaisher graduated at Cambridge, the theory of Elliptic functions did not find a place in the Tripos curriculum.[118] Cayley and Glaisher were lone stars and as Glaisher lamented the pure mathematicians at Cambridge were 'generals without armies' and this sentiment might be applied to describe Ellis's position.

As it happened, the Abel/Jacobi revolution covered in Ellis's Report became an outmoded theory and the field became absorbed into complex function theory ushered in by Karl Weierstrass. This later revolution constituted a fourth historical phase of the theory, becoming part of abstract modern mathematics post 1875. Though Glaisher lived through this period, it is noticeable that he never embraced this phase but remained faithful to the era Ellis had described.

Glaisher did read Ellis and appreciated him. In comparing Cayley and Ellis, he wrote: 'Unlike Leslie Ellis, whose work is everywhere pervaded by the quiet pleasure he took in the contemplation of existing knowledge, Cayley never cared to dwell for long on what had been already been accomplished, however beautiful.' Cayley's motivation was 'to clear the ground for future research.'[119] Cayley adopted a rugged style not pausing to luxuriate but Ellis did exactly this. He adopted a more leisurely approach, quietly assessing pieces of work and putting them into a historical context.

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[116] Arthur Cayley to George Boole, 14 December 1846, TCL, R.2.88.23. Cayley did provide a service to astronomy with his calculatory work but he was not an *observational* astronomer

[117] Arthur Cayley, *An Elementary Treatise on Elliptic Functions*. 2nd edition. (New York: Dover, [1876] 1895).

[118] Herbert H. Turner, "James Whitbread Glaisher (1848–1928)," *Monthly Notices Royal Astronomical Society* 89 (1929): 300–307.

[119] James W.L. Glaisher, "Arthur Cayley," *The Cambridge Review* 29 (7 Feb. 1895): 174–176.

On the eve of his Trinity Fellowship Examination Ellis had questioned his desire for public prominence, and the prospect of piling up future publications. In the answer he gave, he quoted approvingly from Horace, coupling it with his love of mottoes: *fallentis semita vitae* [the narrow path of an unnoticed life]' (25 July 1840).[120] Ellis carried this through. In regard to mathematics, his biographer Harvey Goodwin wrote of this attitude, so clearly out of step with the hastening researcher seeking 'results'. Goodwin wrote that Ellis 'delighted to discuss the principles of investigations already known, to trace the history of processes, to examine the philosophy of a subject, to hunt up its literature, or to simplify its treatment.'[121]

[120] Unlike Cayley and Thomson and other Victorian leaders in science and mathematics, Ellis lived 'under the radar' and was not elected to Fellowship of the Royal Society.

[121] Goodwin, "Biographical memoir," xxviii–xxix.

Chapter 5
Ellis on Mathematical Statistics and Probability

Stephen M. Stigler

Robert Leslie Ellis's work in mathematical statistics and probability can be conveniently grouped under three headings: (1) his 1844 critique of the justifications of the method of least squares, (2) his short 1842 paper on the foundations of probability (with a brief follow-up in 1854), and (3) his return to least squares in 1850.[1] The first of these was a brilliant dissection of two major and one minor derivation of least squares, each under different sets of assumptions. It was the most cited and admired of his mathematical works during his lifetime, and indeed in the nineteenth century. The second was not influential in the 19th century, but it may be the most cited of his works in the twentieth century, when, after the contributions of John Venn (1834–1923), it caught the eyes of a number of philosophers as a partial anticipation of Venn. The third, his return to the topic of 1844, after an 1850 review by John F.W. Herschel (1792–1871) had added a new wrinkle to an old topic, may have been less successful, but it still sheds new light on his understanding. I propose to treat these three topics in that order, with the emphasis being on a brief summary of the issues and a critique of how they may be thought of in the light of current historical understanding. Regarding the third, I will also present a previously unpublished letter from Ellis on the topic.

[1] Ellis's work on mathematical statistics gets passing notice in a number of recent histories, including Richard William Farebrother, *Fitting Linear Relationships: A History of the Calculus of Observations 1750–1900* (New York: Springer, 1999); Anders Hald, *A History of Mathematical Statistics From 1750 to 1930* (New York: Wiley, 1998); Andrew I. Dale, *A History of Inverse Probability*. Second Edition. (New York: Springer, 1999).

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L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0_5

5.1 Ellis and Least Squares in 1844

To understand the scope of Ellis's achievement, it may be useful to offer a very short summary of work on least squares before Ellis.

The method of least squares was formally introduced by Adrien-Marie Legendre (1752–1833) in 1805 as a method of reconciling a set of inconsistent linear equations through a form of averaging.[2] In the simplest case, it involved fitting a line $Y = a + bX$ to points (X_i, Y_i), under the assumption that each $Y_i = a + bX_i + e_i$, e_i being an error of observation. Legendre's elegant but ad hoc solution was to choose a and b to minimize the sum

$$\Sigma\left(Y_i - \left(a + bX_i\right)\right)^2$$

(hence the name he gave the method), and the least squares estimates of a and b were relatively easily calculable linear functions of the Y_i given the X_i. Legendre gave no argument to justify the choice of this measure of fit other than observing that it gave a balance to the points considered as a mechanical system.

Subsequent authors would build the case upon assumptions about the errors of observation, using probability arguments where Legendre had not even mentioned probability. In 1809 Carl Friedrich Gauss (1777–1855) presented an argument that the errors could be considered to be independently random, each following what we now call the normal or Gaussian distribution. He then showed how this would lead to the method of least squares as the best method in the sense that the a and b thus derived made the values of the data (the Y_i's) that were observed more probable than any other possible values of the Y_i's, given the X_i's. We now call this the criterion of maximum likelihood. His argument for the particular choice of a normal distribution was a bit circular. Astronomers, he said, put faith in the arithmetic mean in the simplest case where $b = 0$ and only a is to be estimated, and the arithmetic mean will in that case be the solution found by least squares if and only if the errors have that distribution.

In 1811 Pierre-Simon Laplace (1749–1827), inspired by Gauss's observation of the special role for that particular distribution, gave a lengthy derivation justifying least squares as approximately optimum when n, the number of points (X_i, Y_i), is large, regardless of the distribution of the errors. Gauss in 1809 and Legendre in 1805 found the linear least squares estimates were optimum without restricting the form of the estimates; unlike them, Laplace did restrict to linear estimators.[3]

In two memoirs in 1821–1823 Gauss reconsidered the problem, adopting Laplace's restriction to linear estimators and adding a "mean square error" criterion

[2] Adrien-Marie Legendre, *Nouvelles méthodes pour la détermination des orbites des comètes* (Paris: Firmin Didot, 1805).

[3] For a discussion of the interplay between Legendre, Gauss, and Laplace, see chapter 4 of Stephen Stigler, *The History of Statistics: The Measurement of Uncertainty Before 1900* (Cambridge, MA: Harvard University Press, 1986).

as a measure of fit to the data, and from that deduced least squares without recourse to any assumption about the form of error distribution other than symmetry.[4] This second solution of Gauss's has come to be known as "The Gauss-Markov Theorem," through no fault of Gauss or Andrej Markov (1856–1922).

Ellis's critique of this body of work was a brilliant tour de force. To appreciate what he accomplished, consider the difficulty of the task. Legendre's introduction of the method may have been limited in scope, but it was expressed in as clear a statement as one can find in the mathematical literature: four pages of text that were direct, unambiguous, complete, and his short description was all that was needed to understand what he had done and why he had done it. Gauss's first contribution was as part of his important and brilliant 1809 treatise on gravitational attraction in the solar system, where in passing he made major contributions to spherical geometry and to the handling of linear equations, as well as giving a specific analysis of the orbit of the recently discovered asteroid Ceres. His later work in the 1820s, where he greatly advanced numerical analysis with a new approach to linear equations (Gaussian elimination) was not well understood by any statistical commentator before Ellis.

At least Gauss's work, notwithstanding the difficulty of the material, was rigorously expressed through the exacting mind of one of the greatest mathematicians of any era. Laplace was a different case altogether. His was also a great mathematical mind, but of a markedly different type, where the accurate reach of his conclusions outran the proofs he could provide. He may be the person who introduced the annoying phrase "it is easy to see" to mathematics. In an 1837 review of Laplace's major book on this topic (*Théorie analytique des probabilités*), Augustus De Morgan wrote that '[o]f all the masterpieces of analysis, this is perhaps the least known; [it] is the Mont Blanc of mathematical analysis,' he added, 'but the mountain has this advantage over the book, that there are guides always ready near the former, whereas the student has been left to his own method of encountering the latter'.[5] Ellis himself stated in his critique that 'there are few mathematical investigations less inviting than the fourth chapter of the *Théorie des Probabilités*, which is that in which the method of least squares is proved'.[6] At least Laplace was basically correct in his analysis. The same cannot be said of the articles by James Ivory (1765–1842) which Ellis also discussed: Is there any work that is harder to read carefully than an extensive confused and mistaken analysis by a second-rate mathematical scientist? Ironically, Ellis's diary records him reading Ivory on least squares on 12 September 1840; it may have been Ellis's first encounter with least squares.

Ellis began his critique with the very smallest of points: the initial assumption of Gauss that in simple situations the arithmetic mean deserved a special status. Yet

[4] See Carl Friedrich Gauss, "Theoria combinationis observationum erroribus minimus obnoxiae," *Commentationes Societatis Regiae Gittingebsis Recentiores* 5 (1823): 33–63, 63–90.

[5] Augustus De Morgan, "Review of *Théorie Analytique des Probabilités*," *The Dublin Review* 2/3 (1837), 337–354; 237–248, on p. 347.

[6] Robert Leslie Ellis, "On the method of least squares (Read 4 March 1844)," *Transactions of the Cambridge Philosophical Society* 8 (1844): 204–219, on p. 212.

even there Ellis cast new light. He took the crux of the matter to be the belief that in the long run, the errors plus and minus would tend to cancel out. If the observations were x_1, x_2, etc, and "a" is the true magnitude, so that the errors are $x_1–a = e_1$, $x_2–a = e_2$, etc, then the tendency would be towards $\Sigma e_i = 0$ and so $\Sigma(x_i–a) = 0$, giving $a=\Sigma x_i/n$, the arithmetic mean. But as Ellis observed, equally well we would have $\Sigma f(e_i) = 0$ for any odd function f (where $f(e) = –f(–e)$, as with odd powers of e), and so just as well we should have $\Sigma f(x_i–a) = 0$, which would lead to a conclusion different from least squares. He pointed out that if the probability density of an error e were any function $\varphi(e)$ symmetric about zero, then what we now call the maximum likelihood estimate would be found from solving $\Sigma f(x_i–a) = 0$, where f(e) is the derivative of $\log\varphi(e)$, namely $\varphi'(e)/\varphi(e)$, and we can no more suppose the mean is privileged than we can suppose one particular error distribution is privileged, namely that with $\varphi'(e)/\varphi(e) = e$, the distribution now called the normal distribution. Ellis would surely have been amused to learn that more than a century later, statisticians seeking more "robust" estimates (estimates less sensitive to larger errors than is the method of least squares) would adopt exactly the approach of solving $\Sigma f(x_i–a) = 0$ for an f selected with that goal, calling these "M-estimates".[7]

Having disposed of Gauss 1809, Ellis turned to Laplace. The mathematical question there was entirely different. Laplace, seeing the intimate tie between the normal distribution and least squares that Gauss had brought to attention, saw a different way to reach the same conclusion. In earlier work he had generalized Abraham De Moivre's (1667–1754) demonstration that, for a large number of trials, the binomial distribution could be nicely approximated by the normal distribution. After seeing Gauss's first effort, Laplace saw a way to use that insight in the broader question. If the estimates were to be linear in the dependent observations, then he could show how the smoothing that linearity produced would lead to the final estimates being approximately equivalent to what one would derive if the error distribution was indeed a normal distribution. To that end, he adopted a method of proof using complex analysis that essentially used what later came to be called Fourier transforms. The method was not rigorously developed – this was well before Augustin-Louis Cauchy (1789–1857) took the first serious steps towards the needed rigor. In the most mathematically impressive part of his article, Ellis found a way to do with rigor in real analysis what Laplace had done with complex numbers.

Laplace's use of complex numbers was purely formal, exploiting Leonard Euler's (1707–1783) formula $e^{ix} = \cos(x)+i\sin(x)$ as an analytical tool to integrate powers of $s = e^{ix}$ easily in terms of trigonometric functions. Ellis painstakingly redid the analysis directly in terms of trigonometric expansions, arriving at the same result without invoking imaginary numbers, with the rigor and clarity necessary to convince mathematicians unwilling to accept Laplace's formal leap. De Morgan wrote of Laplace: 'No one was more sure of giving the result of an analytical process correctly, and no one ever took so little care to point out the various small considerations on which

[7] For a discussion see Stephen Stigler, "Simon Newcomb, Percy Daniell, and the history of robust estimation 1885–1920," *Journal of the American Statistical Association* 68 (1973): 872–879.

correctness depends. His *Théorie des Probabilités* is by very much the most difficult mathematical work we have met with, and principally from this circumstance'.[8] Ellis's recasting of Laplace was a tour-de-force. Whether his claim that 'the mathematical difficulty is greatly diminished by the change [in approach]' is accepted would depend on the reader's unwillingness to accept Laplace's formalism on faith.[9] A part of his analysis, on the distribution of sums, was published separately in 1844.[10]

Finally, Ellis moved on to a brief discussion of Gauss's later approach. Of all the early comments on these works, Ellis's may have been the only one that had both a just appreciation of what Gauss presented and of its relationship to the approach of Laplace. By adopting Laplace's restriction to linear estimates and adding the specific measure of mean squared error as a judge of performance, Gauss freed the analysis from any assumptions about errors (other than a balance between positive and negative) or any appeal to asymptotics. It did not answer all questions, of course, and in truth at the practical level few people worried about the foundations of the method. Long after mathematicians had ceased giving attention to Gauss's 1809 argument, textbooks still gave it alone as an explanation, because it was simple and succinct.

Ellis closed his article with a brief and effective dismissal of three efforts by mathematician James Ivory, efforts that had added confusion, not clarity, mostly through misunderstanding of Laplace.

Ellis's analysis of least squares may not have changed the textbook treatments, but it was surely his most famous mathematical work over the last half of the 19th century. It was noticed with approval by mathematicians such as J.L. Glaisher (1809–1903) writing on least squares, and its fame was spread internationally by a much-cited bibliography of works on least squares compiled by Mansfield Merriman as part of his PhD thesis at Yale University in 1876. Merriman's summary of Ellis ends with this endorsement: 'The paper is one of the most valuable in the theoretical literature of the subject'.[11]

[8] Augustus De Morgan, "Theory of probabilities," in *Encyclopaedia Metropolitana, Vol. 2: Pure Mathematics* (London: John Joseph Griffin, 1837), 393–490, on p. 418.

[9] Ellis, "On the method of least squares," 205.

[10] Robert Leslie Ellis, "On a question in the theory of probabilities," *Cambridge Mathematical Journal* 4 (1844): 127–133.

[11] Mansfield Merriman, "A list of writings related to the method of least squares, with historical and critical notes," *Transactions for the Connecticut Academy of Arts and Sciences* 4 (1877): 151–232, on p. 188.

5.2 Ellis and the Foundations of Probability in 1842

Two years before his least squares critique, Ellis had read a short report to the Cambridge Philosophical Society, on the foundations of probability. The topic would not have been fashionable at the time; the joining of mathematical and philosophical considerations of this topic was not entirely new, but serious attempts to examine the subject were mostly in a distant future. In his speculative study, Ellis took off from Jacob Bernoulli's (1655–1705) theorem and an apparent paradox: 'If the probability of a given event be correctly determined, the event will, on a long run of trials, tend to recur with a frequency proportional to this probability. This is generally proved mathematically. It seems to me to be true a priori'.[12] That is, if we accept the long run frequency definition of probability, then Bernoulli's limit theorem is automatically fulfilled, and no proof is needed. And to Ellis, the meaning of probability was unalterably linked to the frequency interpretation.

At one level this was an odd assertion, because it misrepresents what Bernoulli proved, and internal evidence suggests Ellis had never read Bernoulli. As superficial evidence there is the matter that he consistently misspelled the name as "Bernouilli". Of course, he was not the only person of that time to sin in this way. Augustus De Morgan upbraided another sinner of that century with the comment, 'Oh, you have deeply offended me. Pray always keep in mind the personal interest I take in one-eyed philosophers'.[13] (De Morgan had lost the sight of his left eye in infancy.) But what Ellis missed in Bernoulli was deeper and of a mathematical sort that would have interested him.

Bernoulli in fact had seen the same paradox that animated Ellis, although he expressed his view differently. He thought the long run tendency was obvious: 'to judge concerning some future event it would not suffice to take one or another experiment, but a great abundance of experiments would be required, given that even the most foolish person, alone and with no previous instruction (which is truly astonishing), has discovered that the more observations of this sort are made, the less danger there will be of error'.[14] But if Bernoulli thought the simply-stated limit theorem obvious to even the untutored, why did he concoct a proof and just what did he prove? In fact, Bernoulli derived a difficult and complicated proof, not of a limit theorem, but of an approximation theorem with an exact bound on the degree of error. He could, for a given binomial distribution, and for any degree of approximation desired, give a conservative upper bound on the number of trials needed to achieve that accuracy. The commonplace limit theorem Ellis stated could be derived from Bernoulli's result, but the actual result was stronger and much more precise.

[12] Robert Leslie Ellis, "On the foundations of the theory of probabilities (Read 14 February 1842)," *Transactions of the Cambridge Philosophical Society* 8 (1844): 1-6, on p. 1.

[13] F. Hendriks, "Footnote to the article Morgan, Augustus De", in R.H.I. Palgrave, ed. *Dictionary of Political Economy* (London: Macmillan, 1906), 820.

[14] Jacob Bernoulli, *The Art of Conjecturing*. Translated into English by Edith Dudley Sylla, with extensive introductory notes (Baltimore: Johns Hopkins University Press, [1713] 2006), 328.

Bernoulli could tell you how tightly the probability was packed about the theoretical value, something very far from a priori evident. Knowing precisely how concentrated probability is in a high dimensional space for any number of trials is very different from knowing only that at some point it will be concentrated to some degree, but we cannot know how much or when. Bernoulli ruled out a wandering concentration, although only in theory. He admitted that in practice, with a coin or die wearing down, the chance could change.

Would Ellis have taken a different view if he had known Bernoulli's actual result, rather than the popular description given by Laplace in his *Essai philosophique sur les probabilités*, a book written for a general audience? Perhaps not, but at least he would have had a better sense of the mathematical difficulty and it should at least have given him pause. In any case, what Ellis did say was quite interesting. He noted that a central problem with a frequency theory in practice was that it dealt with types or species of like events, and once you get away from dice and coins, deciding whether some instances are of the same type as others depends crucially on defining what was the defining characteristic of "type" in a world where all individuals were different in some respect, while alike in others. In that view, social applications fail because it is impossible to group events as well-defined types. John Venn would later take this on with more success, but Ellis did raise the issue. Venn only noticed Ellis's paper some time after his first edition of *The Logic of Chance* in 1866, and he added a note in the second edition of 1876 stating that their two approaches were 'substantially similar', but he took issue with Ellis's terminology invoking "genus and species", terms he thought less appropriate than his own use of "series".[15]

This question was particularly crucial in induction. Ellis faulted Laplace's treatment of the problem of succession as lacking rigorous foundation. Laplace's rule of succession held that if you had no knowledge of the chance of, say, heads versus tails in tossing a coin, then take all chances as equally likely, and then if you observed n heads in a row, the probability of a head on the next toss is $(n + 1)/(n + 2)$, a consequence of Bayes's theorem. Ignorance, Ellis said, was no justification for assuming a specific form for a prior distribution, even one of uniform probability.

Ellis referenced Laplace on induction, but only for the *Essai philosophique*, and he never cited Bayes. Ellis's criticism of Laplace had merit, especially if read by a rigorous mathematical mind. But had Ellis read Bayes? If he had, he would at least have seen an argument for the possibility of probabilistic induction. And he would have seen a treatment of succession that could have softened his view.[16] In 1854 Ellis published an even shorter comment that did not advance the matter, just recasting the question of "type" in metaphysical terms.

Ellis's notes on the foundations of probability were ignored by his contemporaries De Morgan, Herschel, George Boole, John Stuart Mill, and, aside from the

[15] John Venn, *The Logic of Chance. An Essay on the Foundations and Province of the Theory of Probability, with Especial Reference to its Logical Bearings and Its Application to Moral and Social Science* (London: Macmillan, 1876), 9.

[16] See Stephen Stigler, "Richard Price, the first Bayesian," *Statistical Science* 33 (2018): 117–125.

short note in the second edition of his *Logic of Chance*, Venn. A century later his work was viewed more favourably. A number of recent philosophers have called attention to Ellis's articles, generally as an early anticipation of some of the questions to be addressed in framing a successful frequency theory of probability, rather than as a successful resolution of those questions, a success that Ellis never claimed.[17] Salmon summed up his discussion succinctly: 'Ellis, it seems to me, took us to the very threshold of a frequency theory of probability; Venn opened the door and led us in'.[18]

5.3 Back to Least Squares in 1850

In July 1850, the *Edinburgh Review* published a long article on Adolphe Quetelet's (1796–1874) work on probability and social science. The article was anonymous, but generally known to have been written by John Herschel, and Herschel reprinted it in a collection of essays in 1857.[19] The article was widely read and so appreciated by Quetelet that he translated it into French and despite its length reprinted it, with permission from Herschel, as a preface to the 1869 edition of his *Physique sociale*. Some historians of science have argued that James Clerk Maxwell found his inspiration for his theory of gases in reading this review.[20] Ellis was also an avid reader of the review, and it reawakened his interest in least squares.

The particular passage that caught Ellis's attention was a digression by Herschel offering what he considered to be a new and simple proof for the normal distribution as the general distribution of errors, and hence a new justification for the method of least squares. From considering target shooting and similar examples, Herschel argued that a general error distribution about the two-dimensional target should be symmetric in both horizontal and vertical directions, and that error in those two directions should be independent. Furthermore, the probability of error should only

[17] See Wesley C. Salmon, "Robert Leslie Ellis and the frequency theory," in J. Hintikka, D. Gruender and E. Agazzi, eds. *Pisa Conference Proceedings, vol. 2* (Dordrecht: D. Riedel, 1980): 139–143; Berna Eden Kilinc, "Robert Leslie Ellis and John Stuart Mill on the one and the many of frequentism," *British Journal for the History of Philosophy* 8:2 (2000): 251–274; Sandy Zabell, *Symmetry and Its Discontents* (Cambridge: Cambridge University Press, 2005); Lukas M. Verburgt, "Robert Leslie Ellis's work on philosophy of science and the foundations of probability theory," *Historia Mathematica* 40 (2013): 423–454; Lukas M. Verburgt, "The objective and the subjective in mid-nineteenth century British probability theory," *Historia Mathematica* 42 (2015): 468–487.

[18] Salmon, "Ellis," 143.

[19] See John F.W. Herschel, "Quetelet on probabilities," in John F.W. Herschel, *Essays from the Edinburgh and Quarterly Reviews* (London: Longman, Brown, Green, Longmans & Roberts, 1857): 365–465. (Originally published in the *Edinburgh Review* in July 1850.)

[20] Charles C. Gillispie, "Intellectual factors in the background of analysis by probabilities," in A.C. Crombie, ed. *Scientific Change* (New York: Basic Books, 1963), 431–453; Theodore Porter, *The Rise of Statistical Thinking 1820–1900* (Princeton: Princeton University Press, [1986] 2020), chapter 5.

depend upon the size of the error: the distribution should be such that the probability of any shot (x,y) should only depend upon the distance between the shot and the target (0,0), that is, it should be a function of $x^2 + y^2$, where x and y are the horizontal and vertical errors. Together with independence this led to the product $f(x^2)f(y^2)$ depending only on $x^2 + y^2$, and the only solution possible was a normal distribution. (Unknown to Herschel (and to Ellis), Robert Adrain had offered the same argument in 1808 or 1809).[21]

Ellis's attention must have been drawn to the article soon after publication. By the end of August, he was in correspondence with a friend, Archibald Smith, about the matter. A transcription of a September 3rd letter from Ellis to Smith is reproduced in Part II of the present volume. Smith, a Scottish mathematician, had preceded Ellis as Senior Wrangler at Cambridge and as a winner of, yes, the prestigious Smith Prize (no relation), given since 1769 for performance on examination at Cambridge, awarded to Archibald Smith in 1836 and to Ellis in 1840.

In a short publication in the *Philosophical Magazine*, Ellis raised three points of criticism of "the reviewer" (the letter to Smith shows Ellis knew Herschel was the reviewer). The first was the assumption that there was such a thing as a general law of error that could hold in all circumstances. The second was the assumption that errors in different directions could be considered independent in the technical meaning of the term that Herschel had indeed used, rather than in the casual meaning as simply separate. In both of these, Ellis's complaint had justice. Herschel and others (including Adrain) had been, and many people still are, cavalier in their assumption of independence. Herschel did not reply, but I would guess that the criticism would not have greatly troubled him; he could have felt that the assumptions were approximately sufficient with some generality, even if not full generality. Ellis would have none of that. To him both assumptions were based on ignorance about causes, and nothing could flow from ignorance but more ignorance. "Ex nihilo nihil," was Ellis's frequent refrain, a Latin quotation from Lucretius, after a Greek argument attributed to Parmenides.

Ellis's third point was quite different and quite unfortunate. It was simply wrong and a rare example of how this fine mind could err in substantial ways when rushing into print. At the end of the published note he stated correctly that if you transform to polar coordinates and then find the probability distribution of the distance of a shot from the centre of the target, you get a distribution over the values from zero to infinity, which he derived correctly (we would now say he had derived the distribution of the square root of a Chi-square variate with one degree of freedom). His math was fine, but he then made the absurd comment that since the distance from the centre – the absolute value of the distance from the centre – had a positive most probable value (naturally, since it could never be negative), this contradicted

[21] Robert Adrain, "Research concerning the probabilities of errors which happen in making observations, etc." *The Analyst; or Mathematical Museum* 1:4 (1808): 93–109. (Probably actually published in 1809, perhaps even after Carl Friedrich Gauss. *Theoria Motus Corporum Coelestium* (Hamburg: Perthes et Besser, 1809)). See also Stephen Stigler, "Mathematical statistics in the early States," *Annals of Statistics* 6 (1978): 239–265.

Herschel's claim that the bivariate normal distribution of errors (signed errors) had a centre of gravity at the target's centre point! He wrote, 'the centre of gravity of the shot-marks is not the most probable position […] so that [the reviewer's] hypothesis is self-contradictory'.[22] Ellis, probably writing quickly and carelessly, had confused error and absolute error.

Ellis must have soon realized he had erred; his article had been sent on September 19 (13 days after his letter to Archibald Smith), and it appeared in the November issue. On 7 November he wrote confessing his error; that when the errors are strictly bivariate normal the centre of gravity was as claimed at the centre of the target and that was the most probable point for a shot-mark. He added a hint without proof that without the normal distribution this would not be true.[23] That would usually be true, but it was a weak attempt to recover from an egregious error that must have upset him greatly.

5.4 Ellis and Mathematical Statistics

Ellis was an unusually able mathematician for his time. His was the most insightful critique of arguments for the method of least squares in the 19th century. His understanding of Gauss's and Laplace's works on probability and least squares was in that time only exceeded by Gauss and Laplace, and his explication was often clearer than theirs.

His philosophical work on probability was less successful, but passionate and clear. Ellis's work on the foundations of probability suffered from his apparent unfamiliarity with work by Bernoulli and Bayes. Had he engaged with their ideas instead of with secondary accounts he might well have advanced understanding. Reading Ellis gives the impression of reading an author who, once he is exposed to an idea, pauses to think deeply about how to challenge it, with little curiosity to explore how others may have developed it further and little sympathy for other interpretations.

Ellis's lack of experience in experimental or observational science limited the impact of his critiques of probabilistic approaches to induction. He was a philosopher without patience for a scientist who, despite limited support for a method, cannot plead ignorance and drop the subject but must proceed in any event. His precarious health must have been a great limit to his energies. One can only wonder what he might have accomplished with good health and a longer life. Would he have then tried to extend mathematical statistics, rather than merely critique it? Might he have attacked the philosophy of probability full bore, rather than casually sow provocative seeds? Certainly, the ability was there that could have made him a major

[22] Robert Leslie Ellis, "Remarks on an alleged proof of the 'Method of Least Squares,' contained in a late number of the *Edinburgh Review*," *Philosophical Magazine* Series 3:37 (November 1850): 321–328, on p. 328.

[23] Robert Leslie Ellis, "Note to a former paper 'On an alleged proof of the 'Method of Least Squares"'," *Philosophical Magazine*. Series 3:37 (December 1850): 462.

scientist or philosopher, but as many other cases prove, that is a necessary but not sufficient prerequisite. And his breadth of interests was so wide that we cannot even guess over what fields his mind might have wandered to explore. His reading was extraordinarily wide; he could come up with such surprises as a maxim of metrology, mentioning: 'the Arab's saying that a mile is as far as one can tell a man from a woman'.[24] We are now far from Ellis but close enough to recognize a cast of mind that glows brighter at a great distance than many more celebrated figures in the history of science. We are left to marvel at what he did accomplish in a very short working life.

[24] Robert Leslie Ellis, "Some thoughts on comparative metrology," in William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co., 1863): 373–390, on p. 374.

Chapter 6
Ellis's Philosophy and Bacon Scholarship

Lukas M. Verburgt

'The eye sees not itself but by reflection'
– Robert Leslie Ellis, 23 March 1833

'But great men are such by an inward power, not through outward means, and may be all the greater for the want of it'
– Julius and Augustus Hare, Guesses at Truth

'And yet, that we may honestly confess the truth, as we prize Light very highly, because by it we can find our way, do our work, read what is written, know each other's faces, and yet the sight of Light is itself a thing more excellent and fair than all its uses; so assuredly the contemplation of things as they are, without superstition or imposture, error or confusion, is in itself a more worthy thing than the whole mass of the fruits of inventions put together.'
– Francis Bacon, Novum Organum

With the *Oxford Francis Bacon* yet to be completed, after more than 150 years the standard scholarly edition of Francis Bacon's complete works is still *The Works of Francis Bacon*, which appeared between 1857 and 1859 in seven tomes. 'A monument to Victorian scholarship', the *Works* was the result of a collaboration between three Trinity men – James Spedding (1808–1881), Douglas Denon Heath (1811–1897) and Ellis.[1] Each was responsible for his own part of the edition – Ellis

[1] The quote appears in *Francis Bacon. The Major Works*, edited with an introduction and notes by Brian Vickers (Oxford: Oxford University Press, 2002), 'Note on the text', xlix–l, on p. xlix. Francis Bacon (1561–1626) was himself a Trinity man; he went up there in April 1873, at the age of 12. In what follows, the Spedding-Ellis-Heath edition of Bacon's collected writings will be abbreviated as 'SEH'.

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L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0_6

for the philosophical writings (I-III, 1857) and translations (IV-V, 1858), Spedding for the literary writings (VI-VII, 1858–59) and Heath for the professional legal works (VII). The *Works* nonetheless came to be associated mainly with Spedding, and this with good reason: among other things, it was Spedding who saw all volumes through the press, who defended the edition against criticism, who completed the edition with his seven-volume *The Letters and the Life of Francis Bacon* (1861–74), and who gave his blessing to the more popular American editions and abridged reprints.[2] There is some evidence, however, that the original idea for the *Works* itself had come from Ellis rather than from Spedding. Already in 1847, Ellis, then a young man of about thirty, was preparing an edition of Bacon's philosophical works, offered for publication to Longman. Spedding who acted as intermediary between Ellis and the London publisher, reported on the episode in a letter from May 1847 to William Hepworth Thompson, later Master of Trinity College (between 1866 and 1886):

> [I] have written to Longman, reporting Ellis's proposition, and recommending them to treat immediately with him upon those terms; for that if they get the philosophical works alone so edited, their edition will command the market, even if they do nothing but reprint the rest as they are. Whereas, if any other publisher should engage Ellis's services for that portion, their trade edition would be worthless for ever. […] If they refuse the opportunity, I think I shall decline further connexion with the enterprise.[3]

In the autumn of 1847 a plan was drawn up. It was changed several times over the course of the 1850s and the first volume only saw the light an entire decade later, in 1857. This was due primarily to Ellis's illness, combined with his initial reluctance to leave his work imperfect or abandon it to someone else even when he was housebound in Trumpington, near Cambridge. Ellis, whose philosophical part was to come first, had already advanced so far in 1847 that he expected to have it ready for the press in 1848. But around the end of 1849, with his Trinity fellowship having just expired and his "Bacon" still unfinished, he was seized with a violent rheumatic fever in Italy, where he had travelled partly on account of his health and partly to do library research.[4] The last sentence that he wrote would be printed on page 100 of the first volume of the *Works*, appearing in the preface to the *Novum organum*. 'Again he affirms that he does not inculcate, as some might suppose, a –', to which Spedding attached a note, saying: 'Mr Ellis had written thus far when the fever seized him'.[5] It was only in 1853, when he was no longer able to write, that Ellis handed all his papers over to Spedding, with permission to do with them whatever

[2] For the publication history of *The Works of Francis Bacon* see Lukas M. Verburgt, "'Is there a reader who can handle it with any comfort?': A brief publication history of *The Works of Francis Bacon*," *Notes and Records of the Royal Society*, https://doi.org/10.1098/rsnr.2020.0072.

[3] Spedding quoted in Lord Hallam Tennyson, *Tennyson and His Friends* (London: Macmillan and Co., 1911), on p. 422.

[4] In his letters to Grote and Forbes of 1849–50, Ellis admitted that he was even considering abandoning the Bacon project altogether. See, for instance, Robert Leslie Ellis to John Grote, 2 March 1850, TCL, MAYOR C12/27.

[5] Robert Leslie Ellis, "Preface to the *Novum Organum*," in *SEH* 1 (1857): 71–102, on p. 100.

he thought best. Spedding, who in 1842 had resigned his post at the Colonial Office to devote himself entirely to Bacon, decided to take up Ellis's part himself, 'not knowing of any one [else] who was likely to take so much interest or able to spend so much time in the matter'.[6] Ellis did not abandon his work lightly. The proposal to which he agreed in 1853 was that Spedding would 'print his [Ellis's] notes and prefaces exactly as I [Spedding] found them; explaining the circumstances which had prevented him from completing or revising them, but making no alteration whatever (unless of errors obviously accidental […]) without his express sanction'.[7]

The outcome of the agreement was that the first five volumes of the *Works* were not so much co-edited by Ellis and Spedding as they were Ellis's edition of Bacon's philosophical work as edited by Spedding. Firstly, Spedding corrected errors, added bibliographical information and penned more than half of the prefaces. He even came up with the tripartite division of the philosophical works: writings which were either published or intended for publication as parts of the Great Instauration (Part I, Volume I-II), independent texts connected with it but not meant to be included in it (Part II, Volume III) and writings originally designed for it but superseded or abandoned (Part III, Volume III). Secondly, and arguably more significantly, in his many notes, prefaces and appendices, Spedding also took the liberty to object where he had anything to object to Ellis's editorial commentary, though always making clear what was and what was not his. Hence, the *Works* not merely presented what was then believed to be the complete Bacon corpus. There also was an editorial dialogue running through it, in which Ellis and Spedding debated their interpretations of the nature and relevance of Bacon's natural philosophy, notably his scientific method and natural histories. This editorial dialogue is fascinating, particularly because Ellis's and Spedding's positions were deeply at odds with each other. The difference itself is largely explained by the fact that both had originally arrived at Bacon 'by entirely different roads' and studied his work 'in pursuit of different objects'.[8] Whereas Spedding sought to vindicate Bacon's name – which he essentially did by driving a wedge between Lord Verulam's life and work –, Ellis aimed to 'penetrate the secret' of Bacon's philosophy.[9] Both men entered the mid-nineteenth-century debate on Bacon by reading Thomas Babington Macaulay's 1837 review of Basil Montagu's *Life of Lord Bacon*.[10] Spedding thereafter made it his life's task to defend Bacon against Macaulay, who had praised Bacon's intellect as a philosopher but ridiculed his moral character as a statesman. He set out his arguments in 1847 in the two-volume *Evenings with a Reviewer*, which he printed privately and circulated among friends, including Ellis, who lent his copy to

[6] James Spedding, "History and plan of this edition," in *SEH* 1 (1857): iii–xxi, on p. vii.

[7] Spedding, "History", vii.

[8] James Spedding, "Preface to the *Parasceve*," in *SEH* 1 (1857): 369–390, on p. 370.

[9] Spedding, "*Parasceve*," 370. On Spedding's Baconian life mission see Lisa Jardine and Alan Stewart, "Editing a hero of modern science," in Marina Frasca-Spada and Nicolas Jardine, eds. *Books and the Sciences in History* (Cambridge: Cambridge University Press, 2000), 354–368.

[10] Thomas Babington Macaulay, "Review of Basil Montagu's *Life of Lord Bacon*," *Edinburgh Review* 132 (1837): 1–104.

Whewell.[11] It must thus have come as quite a shock and disappointment to Spedding to find out that his co-editor Ellis more or less agreed with Macaulay's conclusion about the historical significance of the Baconian inductive method: namely, that it had played no role whatsoever in the development of modern science since the time of that other illustrious Trinity man, Isaac Newton.

These, then, were the stakes of Ellis's and Spedding's editorial dialogue in the *Works*: both put forward a view of Bacon's philosophy – with Macaulay's views in the background – that they believed to be closest to the spirit and the letter of Bacon's writings. Like the towering figure of William Whewell (1794–1866), Ellis placed the inductive scientific method – found primarily in the *Novum organum* – at the heart of Bacon's entire project. His main argument about it was twofold. First, Macaulay was wrong about Bacon: he had not reduced induction to unaided common sense. Macaulay, in failing to recognize the distinction between enumeration (i.e. observing instances of *x*) and exclusion (i.e. finding out which laws govern *x*) as inductive procedures, had merely reinforced the popular misconception that Baconian induction entirely shunned theory and method. Second, Macaulay was right to have pointed out that, taken at face value, Bacon's method was historically irrelevant and scientifically useless. Rather than abandoning it, Ellis took it upon himself to insist that and suggest how Baconian induction should be renovated if it were to be relevant and useful. (Whewell's crowning volume of 1858 is tellingly titled *Novum Organon Renovatum*, with obvious reference to Bacon's work.) On the basis of a sweeping combination of textual evidence and interpretation, Ellis sought to make an end to Bacon's 'Protestant democracy of the intellect', where anyone with only 'ordinary acuteness' and 'patient diligence' was able to make scientific discoveries simply by following the inductive method.[12] It was to be replaced by the aristocracy of genius, where those with the 'subtlety' and 'inventive aptitude' of a Kepler, a Newton, and a Brewster reigned supreme. Taken together, as Whewell wrote approvingly in 1858, no maxims will ever 'elevate a man of ordinary endowments to the level of a man of genius'.[13] There were two parts to Ellis's renovation, as put forward in the *Works*: one negative or destructive and the other positive or

[11] James Spedding. *Evenings with a Reviewer. In Two Volumes* (London: Printed by Richard and John E. Taylor, 1848). An "official" edition was published in 1881, after Spedding's death. See, in this context, Ellis's diary entry for 10 March 1841 (TCL, Add.Ms.a.82/2) and Spedding's letter to Whewell, in Tennyson, *Tennyson*, 422–423.

[12] Jonathan Smith, *Fact and Feeling: Baconian Science and the Nineteenth-Century Literary Imagination* (Madison: The University of Wisconsin Press, 1994), 27; Ellis, "General preface to the Philosophical Works," in *SEH* 1 (1857): 21–67, on p. 36. For a discussion of Ellis's views on induction see, for instance, Richard Yeo, "An idol of the market-place: Baconianism in nineteenth century Britain," *History of Science* 23 (1985): 251–298, on 275–276. The literature on Whewell's renovation of Baconian induction is large and ever-growing. The following sources provide useful starting points: Laura J. Snyder, *Reforming Philosophy: A Victorian Debate on Science and Society* (Chicago & London: The University of Chicago Press, 2006), chapter 1; and Henry M. Cowles, *Scientific Method: An Evolution of Thinking from Darwin to Dewey* (Harvard: Harvard University Press, 2020), chapter 2.

[13] William Whewell, *Novum Organon Renovatum* (London: John W. Parker and Son, 1858), 44.

constructive. First, the features central to the 'mechanical mode of procedure', that is, the *logic* or *art*, of Bacon's method – the focus on enumeration and exclusion and the doctrine of forms or simple natures – were to be abandoned or at least toned down.[14] Together, these had given the false impression that discoveries could result from the mere systematization of facts, rather than requiring what Whewell in his 1857 review of the *Works* called 'invention–mind–genius'.[15] Second, the creative process of the formation of new scientific conceptions had to be given pride of place. Bacon himself had recognized the importance of conceptions but had not written anything on the way in which the inductive method was to be used in their formation. Ellis therefore felt confident to conclude that 'Bacon never, even in idea, completed the method which he proposed'.[16] Hence, a renovation of the *Novum organum* was not merely philosophically and historically needed – as Whewell had already pointed out at numerous occasions –, careful reading – something that Macaulay had failed to do – showed that it could be carried out with Bacon's own sanction.

Spedding would praise Ellis's work as an editor, writing in a letter from December 1863 to Harvey Goodwin – Ellis's "official" biographer – that he had been 'a good deal disappointed to find the nature, the value and the amount of [Ellis's] labours upon Bacon so imperfectly appreciated by the popular critics, and so much less preeminence given to his name than was due to it'.[17] But Spedding was not at all convinced by Ellis's "Whewellian" interpretation of Bacon's work, especially because it was at odds with Bacon's intellectual activities during the last few years of his life, roughly between 1620 and 1626. Most importantly, Ellis had neglected the fact that Bacon had abandoned the *Novum organum*, instead deciding to complete *De Augmentis Scientiarum* and start writing *Sylva sylvarum*, among many other works of experimental natural history. According to Spedding, this shift of emphasis demonstrated that, at least to Bacon himself, natural history was, and always had been, more central to the 'Great Instauration' than the inductive method on which Ellis, and Whewell with him, put the sole emphasis.

Despite Spedding's scruples, during the mid-nineteenth and twentieth centuries, discussions of Bacon and Baconianism would almost exclusively be concerned with scientific methodology.[18] Ellis's views, running through the first three volumes of the *Works*, did much to cement this long-standing orientation. They were focused almost exclusively on the *Novum organum* and largely neglected, not to say downgraded, Bacon's natural histories. It is only since fairly recently that Bacon studies has exorcised the 'ghosts of nineteenth-century interpretation', contextualizing Bacon's project within early modern philosophy rather than taking him as an almost

[14] Ellis, "General preface," 23.

[15] William Whewell, "Spedding's complete edition of the works of Bacon," *Edinburgh Review* 106 (1857): 151–168.

[16] Ellis, "General preface," 37.

[17] James Spedding to Harvey Goodwin, 7 December 1863, TCL, Add.Ms.c.90/124.

[18] See Richard Yeo, "An idol of the market place."

contemporary figure.[19] One outcome is that, after more than one and a half century, the position of Spedding in the editorial dialogue with Ellis is being rediscovered, albeit critically.[20]

6.1 Origins: Whewell and the Trinity Circle

Rather than fleshing out the details of the editorial dialogue between Ellis and Spedding, the aim in what follows is to trace some of the steps whereby Ellis arrived at what will be called his 'Baconian idealism'.[21] The period covered is roughly that between 1833, when the 15-year-old Ellis read Bacon by himself for the first time, and 1853, the year in which Ellis, then still only in his thirties, handed over his papers on Bacon to Spedding. During the interim period, Ellis wrote a student paper that staged a dialogue between Bacon and Newton, discussed the historical scientific relevance of Bacon's inductive method with Whewell and published two articles on probability theory containing some clues to his own philosophical outlook. The centrepiece of Ellis's philosophy as well as his Bacon scholarship is without a doubt the 'General preface' to the philosophical volumes of the *Works*, for which he is still remembered today. About a century after its appearance, for example, it was praised by Georg Henrik von Wright, Wittgenstein's successor as Professor of Philosophy at Cambridge, as 'the best account of Bacon's contributions to the logic of induction'.[22] The 50-page preface is, in fact, Ellis's only text on philosophy, published or unpublished, and the single available document of his mature philosophical thought. Because its motivations and sources are relatively obscure today – and since explicit references to contemporary authors in the text itself are very scarce – it is not easy to grasp what his mature thought exactly was. It was influenced by Whewell's work, particularly his *History* and *Philosophy of the Inductive Sciences* (published respectively in 1837 and 1840), and contained strong Whewellian elements. At one point, Ellis asked for Whewell's approval on a matter of interpretation; and Whewell praised Ellis at various occasions, writing in his *On the Philosophy of Discovery* that 'Mr. Ellis has given a more precise view than any of his predecessors had done of the nature of Bacon's induction and of his philosophy of discovery'.[23] But all this is only part of the story, for there is also evidence, for

[19] Markku Peltonen, "Introduction," in Markku Peltonen, ed. *The Cambridge Companion to Francis Bacon* (Cambridge: Cambridge University Press, 1996): 1–24, on p. 2.

[20] See Dana Jalobeanu, *The Art of Experimental Natural History. Francis Bacon in Context* (Bucharest: Zeta Books, 2015) and Graham Rees, "An unpublished manuscript by Francis Bacon: *Sylva Sylvarum* drafts and other working notes," *Annals of Science* 38:4 (1981): 377–412.

[21] See Lukas M. Verburgt, "*The Works of Francis Bacon*: a Victorian classic in the history of science" (2021 in *Isis*), for a detailed analysis of Ellis's and Spedding's editorial dialogue.

[22] Georg Henrik von Wright, *A Treatise on Induction and Probability* (Paterson, New Jersey: Littlefield, Adams & Co., 1960 [1951]), 156.

[23] William Whewell, *On the Philosophy of Discovery* (London: John W. Parker, 1860), 149–150.

instance, of Ellis's possible influence on Whewell and of Whewell's disagreement with Ellis on specific points regarding Bacon.[24] Above all, Whewell's philosophical work was shaped by influences – such as Plato, Bacon, Coleridge and Hare, that is, by Trinity – which shaped Ellis's thinking too, before he read or met Whewell and even before he went up to Cambridge.[25]

Perhaps the central feature of Ellis's outlook is that it was nurtured in the large family home in Bath, reading Plato with his classical tutors, and behind the walls of Trinity College, where an anglicized version of idealism held sway since the 1810s–20s. Some called it 'Platonico-Wordsworthian-Coleridgean-anti-Utilitarianism'; others preferred 'Germano-Coleridgianism'.[26] When seen through a Whewellian lens, one might also call it 'Baconian idealism'. The religious-philosophical outlook of the 'Trinity Circle' was an idiosyncratic mix of Platonism, German literature (Goethe, Schiller), history (Schlegel, Niebuhr) and metaphysics (particularly Kant), Romantic poetry (William Wordsworth, Coleridge), and strong Anglicanism. Its key members were Whewell, Julius Charles Hare (1795–1855), Hugh James Rose (1795–1838) and Connop Thirlwall (1797–1875). There were inside outsiders, like the older Trinity College Fellow Adam Sedgwick (1785–1873), and outside insiders, such as Richard Jones (1790–1855), who was at Gonville and Caius College, as well as Trinity apostates who drifted off in a completely different direction – Charles Babbage (1791–1871) being a prominent case in point. Among its younger, second- and third-generation, members were F.D. Maurice (1805–1872), John Grote (1813–1866), J.B. Lightfoot (1828–1889) and Ellis. There were differences and disagreements between all these men. Therefore, both the explanatory power of the label ('Trinity Circle") and the extent of its influence ('Cambridge Network') should be approached with caution.[27] But for someone like Ellis at least there was enough intellectual sympathy to share in

[24] Menachem Fisch mentions Ellis's possible (if indirect) influence on Whewell, in the context of a Kantian change of heart regarding the laws of motion. See Menachem Fisch, "'The emergency which has arrived': the problematic history of nineteenth-century British algebra: a programmatic outline," *British Journal for the History of Science* 27:3 (1994): 247–276, on p. 253. Snyder has drawn attention to the fact that, despite his highly favorable review, Whewell disagreed with specific points in Ellis's editorial commentary in the *Works*. See Laura J. Snyder. *Reforming Philosophy*, 73–75. See also Whewell, *Discovery*, "Additional remarks on Francis Bacon," 149–156. Interestingly, Whewell's copy of Peacock's *Treatise on Algebra* (1830) – held at Trinity College Library, Cambridge – contains annotations by Ellis. My thanks go to Christopher Hollings for pointing this out to me.

[25] Ellis did read Whewell's treatises on mechanics and dynamics in the early–1830s with Davies, his tutor, but not Whewell's historical and philosophical work.

[26] Richard Chenevix Trench, *Letters and Memorials*. Volume 1 (London: Kegan Paul, Trench & Co., 1888), 10; John Stuart Mill, "Coleridge," in F.R. Leavis, ed. *Mill on Bentham and Coleridge* (London: Chatto & Windus, 1950): 99–168, on p. 108.

[27] The idea of the "Trinity Circle" is developed in detail in William J. Ashworth, *The Trinity Circle. Anxiety, Intelligence, and Knowledge Creation in Nineteenth-Century England* (Pittsburgh: Pittsburgh University Press, 2021). The notion of a much more extensive "Cambridge Network" was first put forward by Walter F. Cannon, "Scientists and Broad Churchmen: an early Victorian intellectual network," *Journal of British Studies* 4 (1964): 65–88. More recently, it has been expounded in John R. Gibbins, *John Grote, Cambridge University and the Development of Victorian Thought* (Exeter: Imprint Academic, 2007). See in this context also, for instance, Geoffrey N. Cantor, "Between rationalism and romanticism: Whewell's historiography of the inductive sciences," in Menachem Fisch and Simon Schaffer, eds. *William Whewell: A Composite Portrait* (Oxford: Clarendon Press, 1991): 67–86.

a sense of common cause. The whole Trinity Circle was united in a quest to defend the eighteenth-century Anglican status quo – with the National Church and National Constitution securing a deeply hierarchical social order – against the connected threats of materialist science, utilitarian morality and democratic politics. Their main aim was to revitalize what was traditional, making the quest for change redundant, but also to guard against what was new, undermining its potential influence. This was done by spreading an "authentic religious temperament" in all domains of human thought and activity, from education to theology and from language to natural science. At least one central feature of authenticity was the unity of poetry and science, of artistic creation and scientific knowledge: both were viewed as asking for a mental activity that is essentially dialectic and synthetic, developing through a process that brings together the personal and impersonal, subjective and objective, spiritual and physical, emotional and logical.[28]

From his days as an undergraduate at Trinity College to his final years as the institution's Master, Whewell regarded the circle's quest in terms of the reform of the inductive philosophy, a reform meant to provide the tools and to lay the groundwork for the overarching attempt of giving 'a right and wholesome turn to men's minds'.[29] Whewell's desire, which he shared with Jones, and initially also with John F.W. Herschel (1792–1871), mirrored – and was influenced by – Francis Bacon's project, itself – as Hare reminded Whewell in a letter from June 1837 – 'the fruit of the College, and not of some rubbishy house in Hyde Park Street'.[30] For them, induction was the 'true faith'.[31] Whewell, for one, contrasted the moral and religious power of the personal process of inductive reasoning with the goal-oriented selfishness and atheism of deductive methods, whether in Ricardian political economy or Continental pure mathematics.[32] However, since Bacon's own inductive philosophy was flawed, before the Baconian gospel could be preached the "true idea of induction" had to be settled. From around 1830, but starting as early as in 1817, Whewell, reflecting on the (progress of the increasingly) mathematical sciences neglected by Bacon, moved towards his idealist Baconianism: he began to see, and in the rest of his large oeuvre would defend, the idea of induction as an antithetical process

[28] On the Romantic vision of knowledge see, for example, R.O. Preyer, "The Romantic tide reaches Trinity: notes on the transmission and diffusion of new approaches to traditional studies at Cambridge, 1820–1840," in James Paradis and Thomas Postlewait, eds. *Victorian Science and Victorian Values: Literary Perspectives* (New Brunswick, NJ: Rutgers University Press, 1986): 39–68. For a recent account of the poetry–science connection in the Victorian era see, for instance, Alice Jenkins, *Space and the 'March of the Mind': Literature and the Physical Sciences in Britain, 1815–1850* (Oxford: Oxford University Press, 2007) and Gregory Tate, *Nineteenth-Century Poetry and the Physical Sciences* (Cham: Palgrave Macmillan, 2020).

[29] William Whewell to Julius Charles Hare, 25 December 1833, TCL, Add.Ms.a.215/29.

[30] Julius Charles Hare to William Whewell, 4 June 1837, TCL, Add.Ms.a.206/170.

[31] William Whewell to Richard Jones, 25 February 1831, TCL, Add.Ms.c.51/99.

[32] See Joan L. Richards, "The probable and the possible in early Victorian England," in Bernard Lightman, ed. *Victorian Science in Context* (Chicago & London: The University of Chicago Press, 1997): 51–71; and J.P. Henderson. *Early Mathematical Economics. William Whewell and the British Case* (Lanham: Rowman & Littlefield, 1996).

involving both an empirical and a conceptual element, the one supplied by careful observation and the other by the creative human mind. Herschel would object that Whewell had, hereby, *de facto* abandoned Bacon. Some, like George Peacock, held that Whewell was 'bedeviled with German philosophy'.[33] Whewell himself, however, firmly believed that his position was fully consistent with Bacon's own work and remained 'most true, philosophical, and inductive'.[34] Like Ellis would do in his 'General preface' to the *Works*, Whewell claimed that Bacon had recognized but not given enough 'weight or attention to the ideal element in our knowledge'.[35] Having toyed with the idea for several years, by 1837, when the young Ellis was in his second year, Whewell formulated his position more systematically, appending 'Remarks on the Logic of Induction' to his textbook *Mechanical Euclid* and publishing his *History of the Inductive Sciences* in that same year. Whewell situated himself somewhere between Locke and his followers of the sensationalist school, who focused only on the empirical, and Kant and the German idealists, who focused only on the ideal. What he believed set him apart was the notion that knowledge requires a combination of both elements: 'without our ideas, our sensations could have no connexion; without external impressions, our ideas would have no reality'.[36]

Whewell, however, was not a British Kantian of sorts. Neither was he a 'Germano-Coleridgian'. He read Kant, in a time when German philosophy was not really popular in England, and he appreciated the *Critique of Pure Reason*, if only for showing that the Circle's arch-enemies, Locke and his French advocates, were wrong about knowledge. And although he never came as close to Coleridge as, say, his friend Julius Hare, Whewell did acknowledge that Coleridge's influence on Cambridge philosophy – and that of Trinity in particular – 'has been so great, and in many respects so beneficial'.[37] More interesting, also with an eye to his intellectual ties with Ellis, is where Whewell deviated from Kant. Like Kant, he wished to understand how universal and necessary scientific knowledge (e.g. in arithmetic, geometry, mechanics, physics) is at all possible. And his answer, much like Kant's, involves certain *a priori* conceptions or ideas that function as conditions of knowledge. One of the major differences with Kant is that Whewell did not distinguish between the *a priori* elements of knowledge provided by human intuition (*Sinnlichkeit*), understanding (*Verstand*) and reason (*Vernunft*), instead calling space, time and causality ideas, all of which he placed in the human mind. Another difference is that Whewell

[33] William Whewell to Richard Jones, 17 October 1825, TCL, Add.Ms.c.51/23. Whewell had then just returned from a trip to Germany, where he studied with the mineralogist Friedrich Mohs to prepare for his candidacy for the chair of Mineralogy at Cambridge.

[34] William Whewell to Richard Jones, 17 October 1825, TCL, Add.Ms.c.51/23.

[35] William Whewell, *The Philosophy of the Inductive Sciences.* New Edition. Second Volume (London: John W. Parker, 1847), 237.

[36] William Whewell, *The History of Scientific Ideas.* Volume *I* (London: John W. Parker, 1858), 58. The similarity with Kant's famous phrase – "thoughts without content are empty; intuitions without concepts are blind" – is rather striking.

[37] William Whewell, *Lectures on the History of Moral Philosophy in England.* Volume 2 (Cambridge: Deighton, Bell, and Co., 1862), 119.

believed that ideas did not function as conditions of experience *per se*, but as conditions for knowledge within a particular science (e.g. the idea of Chemical Affinity in chemistry). Consequently, ideas emerged over time and new ones could arise with scientific progress. Perhaps most importantly, Whewell denied that we can only have knowledge of the world as mediated by our own ideas; these ideas represent the world as it is, independent of, and external to, our mind. Whewell's argument for this view relates to his non-Kantian take on the divine nature of human ideas:

> The human mind can and does put forth, out of its natural stores, duly unfolded, certain Ideas as the bases of scientific truths; These Ideas are universally and constantly verified in the universe; And the reason of this is, that they agree with the Ideas of the Divine Mind according to which the universe is constituted and sustained.[38]

This was the Baconian idealism that Whewell placed at the heart of his contribution to the Trinity Circle's mission and for which Ellis would always feel deep sympathy. All genuine knowledge is inductive but it is the human mind that plays the key role in the process of induction. On the one hand, *pace* Bacon, the mind is thus an active and creative participant in the attempt to gain knowledge of the world. On the other hand, *pace* Kant, the ideas through which the human mind obtains knowledge of the world are part of that same world, since both are divine creations. Hence, induction incorporates religion into the heart of science: it is through this gradual process that we 'learn something of God' (e.g. that 'the Ideas of Space and Time are Ideas according to which God has established and upholds the universe') and that we become aware of 'the infinitely limited nature of the human mind, when compared with the Creative or Constitutive Divine Mind'.[39]

Ellis's philosophical outlook, as it developed between the 1830s and 1850s, showed a striking and growing affinity with the views *en vogue* at Trinity from the 1810s–20s onwards. As a boy, Ellis was trained to study at Cambridge; but – a born Platonist with a German tutor ("Mr Reichel") – it was almost as if he was made for Trinity. At any rate, it is hard to avoid the impression that there was something about Ellis, whether it were his inborn interests or natural sympathies, that made Trinity the perfect place for him, and *vice versa*. For instance, it is striking that, before going up there in 1836, Ellis was already well-versed in Plato, Bacon, Berkeley, and Coleridge and that, as a Fellow, he never studied closely J.S. Mill's *System of Logic*, instead deciding to read Aquinas, Leibniz, Kant and Dugald Stewart.[40] Harvey Goodwin, writing in his 'Biographical memoir' of Ellis, noted that 'there was something congenial to [Ellis's] own cast of mind in the discussions of the schoolmen [the medieval Scholastics, who attempted to reconcile ancient philosophy with Christian theology, LV], and […] he appreciated Bacon all the more in virtue of his appreciation of those, whose processes of thought and methods of argument it was

[38] Whewell, *Philosophy of Discovery*, 374.

[39] Whewell, *Philosophy of Discovery*, 377 and 383.

[40] See Robert Leslie Ellis to William Whewell, 11 October [probably late–1840s], TCL, Add. Ms.c.67/105. Ellis did read Mill, if only very cursory (see diary entries for April, 1 May, and 2 May 1840).

Bacon's task to supersede'.[41] There was, indeed, something old-fashioned about Ellis's bent of mind. But it was precisely this that made him feel at home at Trinity in the 1830s–40s. All of Ellis's Baconian idealist viewpoints bore the stamp of the Trinity Circle and may be found, in more or less explicit form, in the oeuvre of Whewell, who became his brother-in-law in 1858. Ellis also made original contributions of his own. In fact, he may be seen as the last major advocate of the Trinity Circle before his more prominent friend John Grote (1813–1866), Whewell's successor as the Knightbridge Professor of Moral Philosophy in 1855, who himself always professed to have been greatly influenced by Ellis.[42] Ellis would defend its religious-philosophical outlook in other and new contexts beyond poetry, literature and philology (Coleridge, Hare) and history and philosophy of science (Whewell), such as that of pure mathematics and probability theory. Most significantly, of course, it was Ellis who placed it at the centre of what would become the standard Victorian edition of Bacon's collected works.

6.2 Philosophy at Bath, 1834–1836

Ellis's home education as a boy was focused on the Cambridge curriculum of classics and mathematics. Although his wide reading included drama, novels, poetry, 'useful knowledge' and sermons, it was Latin, Greek, algebra and geometry that took up most of his time. The very first diary entry, of May 1827, when Ellis was 9 years old, mentions Richard Whately's (1787–1863) *Elements of Logic* (1826), to which he would return in July 1832. This work almost single-handedly put traditional syllogistic (or 'Aristotelian') logic back on the intellectual map in Britain, where it had fallen into disrepute ever since the second half of the seventeenth century, largely due to the criticism of Bacon and Locke. Bacon had presented his *Novum organum* as a replacement for Aristotle's *Organon*, which contained the six standard books on syllogism. According to Bacon, the formal logic of the Scholastic-Aristotelian tradition was useless for natural philosophy, mainly because it only concerned itself with the validity of conclusions and not with the establishment of their premises. What was needed was an inductive method, applicable to the new

[41] Harvey Goodwin, "Biographical memoir of Robert Leslie Ellis," in William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell, and Co., 1863): ix–xxxvi, on p. xxx. This echoes a remark on Bacon in the Hares' *Guesses at Truth*: '[I]n Bacon himself one may perceive that many of the flaws, which here and there disfigure his writings, would have vanisht [sic] if he had entertained less disparaging notions of his predecessors' (Julius C. Hare & Augustus W. Hare, *Guesses at Truth.* Third Edition. First Series (London, 1847), 211).

[42] On John Grote see, for example, Lauclin D. MacDonald, *John Grote. A Critical Estimate of his Writings* (The Hague: Martinus Nijhoff, 1966) and Gibbins, *Grote*. For a discussion of Grote's place in the Trinity tradition see, for instance, Philip Aherne, "The 'way of seeking': the Coleridgean development of utilitarianism in Cambridge," in Peter Cheyne, ed. *Coleridge and Contemplation* (Oxford: Oxford University Press, 2017): 105–122, especially section 4.

sciences, aimed at the discovery of new truths about the world. Whately took it upon himself to defend deductive reasoning against the attack of the British empiricists, even going so far as to deny that induction was a form of inference at all. His radical position did not attract any followers, but almost every nineteenth-century logician would attribute the revival of logic to Whately, and much of British logic from that period may be understood as a commentary on the *Elements of Logic* – ranging from William Hamilton's quantified formal logic to George Boole's algebraic logic and Mill's and Whewell's new inductive canons. Since the book itself was largely a criticism of the Baconian tradition, those who defended induction against Whately tended to place themselves in this tradition, whether they were empiricist-utilitarian, like Mill, or idealist and Anglican, like Whewell. At Trinity College in the 1820s–30s, Whately, Nassau Senior (1790–1864) and like-minded 'deductive savages' working in logic and political economy from Oriel College, Oxford, were being chastised as 'ungodly' and 'downward mad people'.[43]

Whewell and Jones made it their personal mission to defend the 'great cause' – that of a reformed Baconian-inductive philosophy – against deductivist manifestos like the *Elements of Logic*.[44] It is rather fitting that this was the first philosophy book that Ellis read, partly by himself and partly with his father. Interestingly, the second philosophy book mentioned in Ellis's diary was also a work on logic: Isaac Watts' *Logick* (first published in 1724, with twenty later editions), which Ellis, following Jeremy Bentham, called the 'Old-Woman's Logic' (17 June 1830). This standard textbook, found by Ellis at the Bath Royal Literary and Scientific Institution, closely followed the syllogistic tradition on reasoning and argumentation, while also sprinkling insights from the work of Locke – for instance agreeing that all ideas come from sensation and reflection. Ellis would read Locke's *An Essay Concerning Human Understanding* (1689) together with his father in the summer and fall of 1834, remarking in his diary that he liked a lot of it but that he was undecided about the first book, 'Of Innate Notions' (10 August 1834). At several universities, including Cambridge, Watts' *Logick* would soon be replaced by Whately's *Elements of Logic*, which criticized Bacon, Locke and Watts for trying to introduce the formation of premises into the province of logic. Instead, Whately argued, induction is an inference governed by syllogistic form, such that the conclusion is always already contained in the premises. Like Whewell, Ellis would come to disagree with both approaches, as they failed to capture the imaginative mental process by which knowledge is obtained. If this did not have a place in mainstream logic, whether inductive or deductive, then, as Whewell would remark in an 1859 letter to his former pupil Augustus De Morgan, '*so much the worse for Logic*'.[45]

Before reading Bacon, or Whewell, Ellis read "Herschell's" *Preliminary Discourse on the Study of Natural Philosophy* (1831), which had the bust of Bacon

[43] William Whewell to Richard Jones, 23 July 1831, TCL, Add.Ms.c.51/110.

[44] Richard Jones to William Whewell, 24 February 1831, TCL, Add.Ms.c.52/20. See Snyder, *Reforming Philosophy*, chapter 1; Henderson, *Early Mathematical Economics*, chapter 1.

[45] William Whewell to Augustus De Morgan, 18 January 1859, in Isaac Todhunter, *William Whewell, D.D. An Account of his Writings with Selections from his Literary and Scientific Correspondence*. Volume II (London: Macmillan and Co., 1876), 417.

on its title-page. (Ellis started reading on 4 January 1831 and finished the 350-page book a week later.) Like Whewell, Herschel wished to renovate Bacon's inductive scientific method, but they had different views on what this method entailed.[46] These different views of Bacon are apparent in the reviews they wrote of each other's books. Whewell, writing in the *Quarterly Review*, accused Herschel of neglecting Bacon's 'condemnation of the method of anticipation, as opposed to that of gradual induction' in allowing for hasty leaps to hypotheses. Some nine years later, Herschel returned the charge of anti-Baconianism in his lengthy joint review of Whewell's *Philosophy* and *History of the Inductive Sciences*, lamenting the ideal or conceptual element of Whewell's position. As he wrote to his friend: 'You are too a priori rather for me – as soon as one has worked one's way up to a general law you come cranking in and tell me it is a Fundamental Idea innate in everybody's mind'.[47] Ellis enjoyed the *Preliminary Discourse* when he first read it. Some twenty years later, however, he confessed to James D. Forbes that he thought Herschel was 'a charlatan: honorably distinguished no doubt […] but neither clear nor deep'.[48] It is interesting to observe that in the *Works*, Spedding would refer to Herschel as part of his argument against Ellis, who, tellingly, always only referred to Whewell when the opinion of a 'modern scientific writer' was needed.[49]

More than Aristotle, Herschel, logic or method, the young Ellis liked Plato and metaphysics. 'Every man is born an Aristotelian, or a Platonist', wrote Coleridge in 1830 – and, as Hare told Whewell in 1822, 'Plato is worth ten thousand Aristotles'.[50] There is some truth to this as far as Ellis is concerned. He would eventually read Aristotle – initially his dramatic and literary theory and later his philosophical works, in the context of editing Bacon – but never expressed a favorable opinion of his work.[51] By contrast, from early on, Ellis was duly convinced that knowledge was not limited to observable things; there were abstract truths too, which could be apprehended by some higher faculty than reasoning. Some of these may well be innate (10 August 1834). At the same time, there were things, like the real nature of

[46] On Herschel's view of induction – still a little studied topic – see Richard Yeo, "Reviewing Herschel's *Discourse*," *Studies in History and Philosophy of Science* 20 (1989): 541–552 and Aaron D. Cobb, "Is John F.W. Herschel an inductivist about hypothetical inquiry?," *Perspectives on Science* 20 (2012): 409–439.

[47] John Herschel to William Whewell, 6 August 1840, TCL, Add.Ms.a.207/45.

[48] Robert Leslie Ellis to James D. Forbes, 20 September 1850, SAUL.

[49] Cf. Spedding, "Preface to the *Parasceve*," in *SEH* 1, 29, 94, 299, 458 and 461.

[50] Samuel Taylor Coleridge, *Specimens of the Table Talk of Samuel Taylor Coleridge*. Second Edition (London: John Murray, 1836), 95; Julius Charles Hare to William Whewell, 13 May 1822, TCL, Add.Ms.a.77/127. See also David Newsome, *Two Classes of Men: Platonism and English Romanticist Thought* (London: John Murry, 1974).

[51] Ellis referred to 'Aristotle's rule [in his *Poetics* the earliest surviving work of dramatic theory, from c. 335 BC] that the choral songs should in some degree advance the action' in a diary entry from 3 September 1831. The name of Aristotle only appears again some eight year later, when Ellis reports that his friend Tom Taylor made him go to Joseph Blakesley's (1808–1885) lecture on Aristotle (17 April 1839). In that same year, Blakesley, a member of the Cambridge Apostles and tutor at Trinity College, published a book on Aristotle: Joseph William Blakesley, *A Life of Aristotle, including a Critical Discussion of Some Questions of Literary History Connected with His Works* (Cambridge: J. and J.J. Deighton, 1839). Gooden, another close friend of Ellis's, is also known to have been very keen on Aristotle.

the soul, of which he knew that they were 'above human intelligence' (27 March 1833). Due to his awareness of their mutual influence, Ellis's major philosophical concern in his 1830s diaries was the Platonic theme of the relation of body and mind, of the physical and the ideal, to one another. 'I am not in spirits, another black fit; surely there is a connection between the mind & the body', Ellis, for instance, noted on 12 October 1834: 'If the mind be an essence, *sui generis*, it is odd that it grows with the growth of the body – that it waxes and wanes as the physical energies' (12 October 1834). Together with Cicero (whom he first read on 1 January 1831), particularly his *De finibus bonorum et malorum* (begun in August 1833), where the views of Epicureanism, Stoicism and later Platonism were explained, Plato was the young Ellis's first and main philosophical influence. This is not surprising per se, as Ellis, of course, came to philosophy through his classical tutor Johnston. After several years of Homer, Ovid, Virgil, Aeschylus and the likes, in November–December 1831 Ellis, aged 14, construed his first "Plato", the *Second Alcibiades*, a dialogue on prayer.[52] Plato immediately became a favourite. A year later, in December 1832, Ellis noted: 'I should very much like to read some more of Plato. The dialogue on *to kalon* ('the beautiful') [*Hippias Major*, LV] I should like to understand. The phrase "love of the beautiful" seems to me tautology' (14 December 1832). (Ellis read the whole of *Hippias Major* in September 1834, by which time he criticizes its anatreptic form.) By January 1833 he began the *Phaedo* with Johnston, the famous dialogue on the immortality of the soul, something which he tellingly took be 'rather natural than shown by reasoning' (7 January 1833). Ellis liked both the style and 'sentiments' of it, writing that the 'metaphysical reasoning' was even better than in Cicero's *De natura deorum* (*On the Nature of the Gods*) (16 and 21 January 1833). 'What it is that makes me so fond of metaphysics I know not', Ellis wrote in his diary in January 1833; what he did know was that he admired Plato 'fervently' and that he understood the arguments better than Johnston (25 and 29 January 1833, 15 February 1833). (About a year later, he concluded: 'I am not fond of any but the most abstract science', preferring that which has 'the least reference to any actual existence' (9 October 1834.)) By May 1833, Ellis wrote confidently that he found some of Plato's reasoning 'very loose' – all the same, 'I would if I could know what the author is about' (3 and 17 May 1833). Around that time, Ellis was already reading other, early modern philosophy works – apparently at his own initiative and of his own choosing. For example, on 5 May 1832 he noted that George Berkeley's *Three Dialogues* (1713) – a semi-popular defense of the idealist epistemology advocated in the canonical *Treatise Concerning the Principles of Human Knowledge* – 'seems to have been taken more from Cicero than from Plato' (5 May 1832). Ellis returned to Berkeley 1 month later, reading the *Alciphron*, or *The Minute Philosopher*, a plea against Catholic 'freethinkers'. 'I do not attempt to understand [it] at all thoroughly, though I admire the subtlety of what I can comprehend', Ellis noted on 16 June.

[52] The *Second Alcibiades* is a dialogue traditionally ascribed to Plato, but there is a long-standing dispute amongst scholars about the text's authenticity.

Bacon entered the scene in Ellis's diary in the Spring of 1833, when Ellis, aged 16, began a translation into Greek of Bacon's essay 'Of Empire' (1612). A few months later, in October, he started to work on a re-translation into Latin of a passage from (what must have been a later English translation of) the 'beautiful' 'Wisdom of the Ancients' (*De sapientia scientiarum*, 1609) (23 October 1833). Since he came to Bacon, and Plato, through Latin and Greek writing exercises for Johnston, Ellis was much concerned with Bacon's style, again using Cicero as a standard of excellence. For example, on 3 November 1833 he notes: 'I wish that I cld write as this great man whose style reminds me more of the gorgeousness of Cicero than any author I remember' (3 November 1833). A week later he notes: 'We are so flippant, so missish [i.e. prim or characteristic of a young lady or schoolgirl] in our writing these days that the golden style of Bacon & Milton & Taylor is neglected & even censured' (9 November 1833). Throughout his diaries, Ellis also constantly reflects on the content of Bacon's works, writing what he likes about, say, the 'Wisdom of the Ancients' ('there is great ingenuity in these interpreted myths', 19 May 1834) and asking himself why he likes the *Essays* even better ('the influence of these short & pithy sentences, into which much thoughtful observance of humanity is compressed, can hardly be estimated', 20 May 1834). For Ellis, style was always intrinsically related to content, in so far as beauty and knowledge were, for him – as they had been for Plato and Coleridge before him – more or less inseparable. At times, Ellis even wrote of the 'worshipping of the beautiful' (11 May 1834) as a condition for arriving at true knowledge. He ascribed an epistemic status to poetry, as Coleridge had done in his *Lyrical Ballads* (1798), or at least shunned the distinction between the poetic and scientific. Despite all his merits, Bacon was not a poet: he lacked both the 'taste' and 'exquisite sense' to recognize the 'connection & sympathy between the great world & the microcosm of the heart' (11 May 1834). This is interestingly related to another, more personal, remark from later that year, where Ellis reflected on Bacon's personality. He called Bacon 'a man who was all mind', one who 'preferred the intellectual pleasures to those of the affections' (22 June 1834). It was not that Ellis himself did not prefer the contemplative life, but he simply experienced too much physical and mental discomfort to be entirely 'bookish'. In September of that year, for instance, he remarks that pain 'is absolutely necessary to our well-being; that restlessness is part of our essence' (16 September 1834). The underlying message was that *what* someone knows is not only reflected in that person's style but also conditioned on *how* he or she has come to know it – a personal process to which the 'connection between the mind & the body, which conveys the impressions made on the one to the other' is crucial (11 October 1834). All the same, *whether* someone arrives at knowledge of outward things has everything to do with that person's inner life, as 'moral worth' and 'intellectual superiority' are inseparable too (27 July 1834). 'I am fully convinced', wrote Ellis, 'that a thoroughly good intellect is always accompanied by pure & holy morality', as 'a heart corrupt argues a head unsound' (27 July 1834). Ellis here touched on what would become two major themes of the early Victorian era: the

notion of genius and its connection with method and morality, such as in the case of Newton, and the tension between Bacon's moral character and philosophical work.[53]

It was in May 1834 that Ellis for the first time read one of Bacon's philosophical works systematically and all by himself: 'The Advancement of Learning' (1603) – a work later expanded and Latinized as *De augmentis scientiarum* (1623). This formed the first part of the 'Great Instauration', containing a division and classification of the new sciences organized around the tree metaphor: the sciences are like branches of a tree that meet in a stem, a single "universal science', or *philosophia prima*, whose axioms are shared by all the individual branches. 'No one can admire Bacon more than I do – his felicity of expression & his wonderful perspicacity are enough to deserve all the admiration of posterity', wrote Ellis on 12 May 1834. 'Nevertheless', adding a remarkably prescient remark:

> I think that the "Principia" […] would have been written had the highpriest of philosophy never existed or if circumstances had prevented him writing the "Advancement" or the "Novum Organum" (12 May 1834).

By that time, Ellis was sporadically reading 'ye "Organum Novum", which he finished in August of that year (see 29 June and 3 August 1834). This unfinished work – the second part of the Great Instauration, originally published in 1620 – contained Bacon's inductive scientific method, which (much to Whately's ridicule) was meant to replace *in toto* the Aristotelian syllogistic method. Ellis found it rather 'tiresome' at times, especially its long tables of heat, whereby Bacon illustrated the process of the induction by exclusion (29 June 1834). What interested Ellis were not the applications and examples but the abstract fundamental principles of science. When it came to these principles, the *Novum organum*, however 'noble', was 'full of errors – the errors of the time' (3 August 1834).

Ellis was not only reading Bacon's own works but also some of the major Victorian commentators on Bacon. Already in February 1834, he 'looked over' Basil Montagu's *Life of Francis Bacon*, quickly concluding that Montagu, the editor of the then standard edition of Bacon's writings (16 volumes, 1825–37), 'does not seem a great scholar' (11 February 1834). Although he might not have thought much of his intellectual capabilities – let alone of his knowledge of Greek and Latin –, it was through reading Montagu that Ellis entered the nineteenth-century debate on Baconianism and, thereby, eventually arrived at Bacon scholarship. For it was Montagu's *Life* that was the object of Macaulay's criticism and it was Montagu's complete edition of Bacon's writings that the *Works* sought to replace.

'I think that my studies are over for the present – as I have little left to read' (28 September 1834). After 1834 Ellis, indeed, read but little philosophy, as his Cambridge preparations intensified and his focus came to lie even more exclusively on classics and mathematics. He occasionally returned to Plato and Bacon, and there were Alexander Pope's *An Essay on Man* (1734) (19 June 1836), which popularized the 'optimistic' view, found in Newton and Voltaire, of a divinely

[53] See Yeo, "Idol," and Richard Yeo, "Genius, method, and morality: images of Newton in Britain, 1760–1860," *Science in Context* 2:2 (1988): 257–284.

ordered human condition, and Seneca the Younger's *De Vita Beata,* a book on the good life which Ellis did not like ('It is astonishing how little there is in it. Epicurus was the only one who has caught a glimpse of the truth – that all motives spring from a consciousness of pleasure', 13 June 1836). One other exception was the Hare brothers' *Guesses at Truth* (first anonymous edition in 1827), which Ellis found in a London library in July 1836 (15 July 1836). (Ellis would receive the book as a gift from his friend Tom Taylor, who was enthusiastic about Hare, several years later, in February 1839.) He praised it for its strong 'contempt for "ratiocinative understanding", which furnished him with much 'material for thought' (15 July 1836). The less philosophy Ellis read, the more he turned to penning down his own thoughts on philosophical matters, albeit sporadically: in August 1834, he resolves to write 'a metaphysical essay to show my profundity' (1 August 1834) and in May 1836 he is scribbling remarks on the *Novum organum* (8 May 1836).

Ellis's main philosophical influences in the 1830s came from books, as well as from Johnston and his father, with whom he read some of them. One other personal influence from this period deserves mention, that of the Rev. H.F.C. (Henry) Logan (1800–1884) – Professor of Mathematics (1830–?) in the Catholic College of Prior Park, near Bath, and President of St Mary's College, Oscott (1847–8). Logan, a correspondent of William Rowan Hamilton and Arthur Cayley, among others, and an acquaintance of Davies, Ellis's mathematics tutor, was well-versed in Continental mathematics and German philosophy. By 1834, having reflected on 'the theory of Idealism', found in the work of Berkeley, Kant and Fichte, he came to hold the belief 'that the phenomena of the external world and their laws are the produce of the mind itself', adding that 'the Theory of Space and Time adopted by Kant […], which I believe to be the only sound one yet proposed, evidently leads to the same conclusion'.[54] Ellis was introduced to Logan in the summer of 1834, when for some time the two met almost weekly, and he much enjoyed their conversation. Logan amused him with a curious story about the Polish mathematician-philosopher-messianist Józéf Maria Hoene-Wronski (1776–1853) and his "Absolute philosophy". It was also Logan who first told Ellis about Kant's *Critique of Pure Reason*. In a diary entry of 24 June 1840, Ellis would note that 'I caught the germ of it, viz. Kant's view of time & space, from Logan ages ago' (24 June 1840). He then went on to remark that he had often 'sported' (i.e. proposed, tried out) the idea that 'time cannot be a cause – because time is only the condition of the existence of causes' in examinations, wondering whether 'I made my fortune with Whewell by so casual an advantage' (24 June 1840). Among the many things that Ellis brought with him from Bath to Cambridge, Kantian sympathies evidently were one of them.

[54] H.F.C. Logan to William Rowan Hamilton, 31 May 1834, in Robert Perceval Graves, ed. *Life of Sir William Rowan Hamilton.* Volume II (Dublin: Hodges, Figgis & Co., 1885), 86.

6.3 Philosophy at Cambridge, 1836–1840

At Trinity College, Cambridge, where Ellis came into residence in October 1836, the focus was on classics, in the first year, and on mathematics, from the second year on. One of the rare occasions on which Ellis returned to philosophy – or to Bacon, more particularly – as a student was for the English declamation competition (the 'Hooper Prize') of 1838. These prizes, endowed in 1760 by Francis Hooper (1694–1763), were to be awarded each year to three students for 'an English Oration to be delivered publickly in the [College] chapel on a Subject entirely relative to the English Nation or History'.[55] As a phenomenon in itself, the Hooper Prize is quite remarkable for several reasons. One is its 'Englishing' of declamation at Trinity College, where Latin was the traditional standard, going back to the statutes of 1560. Another, more striking, reason is its proof of the continuing importance of rhetorical activity in the University at a time when mathematics and written examinations came to dominate at the expense of Cambridge's oral academic culture. For a student like Ellis, it may be added, the competition provided a welcome escape from mathematics (of which he was 'sick to death (23 December 1838)) and an opportunity to develop his own thoughts, some of which had ripened for several years.

Ellis began to prepare for his declamation in November 1838, writing out the first half on the 9th – rehearsed the next day ('just about remembered it') –, finishing a complete version on the 24th – read to his friend Alexander Gooden (1817–1841) on the 27th (who said that 'it has too much matter, & is too difficult') –, and having a fair handwritten copy made to submit to the Dean, before finally delivering it in the College Chapel on 1 December.[56] Ellis, who would rank second after Lord Francis Napier (1819–1898), agreed with Gooden that his text did not make for a good declamation, considering that it were the 'flimsy things which get prizes'.[57] But, writing to his father, Ellis decided that 'I would rather write what would show that I understand & have thought upon a difficult & important subject' (i.e. 'the authority of induction'), to which he added that 'if [William] Carus [(1801–1891), Senior Dean of Trinity College], who is the judge, understands my declamation, he is more of a philosopher than I take him for'.[58]

Ellis's 1838 declamation on Baconian induction seems to have been inspired by two texts: Macaulay's 1837 review of Montagu's *Life of Francis Bacon* and Coleridge's 1818 'General Introduction, or, Preliminary Treatise on Method'. Macaulay had influentially attacked both Bacon's moral character and his

[55] See C. Reid, "Whig declamation and rhetorical freedom at Trinity College, Cambridge, 1770–1805," *The Review of English Studies* 64:266 (2013): 630–650, on p. 635.

[56] See Ellis's diary entry for 10 November 1838 and Robert Leslie Ellis to Francis Ellis, 26 November 1838, TCL, Add.Ms.c.67.4.

[57] Robert Leslie Ellis to Francis Ellis, 26 November 1838, TCL, Add.Ms.c.67/4. The essay was read on 1 December 1838 and submitted for the Hooper Declamation Prize for 1839.

[58] Robert Leslie Ellis to Francis Ellis, 26 November 1838, TCL, Add.Ms.c.67/4.

philosophical reputation. About this famous review, Ellis would at one point make the telling and prescient remark that, 'as for Bacon's philosophy, he does not understand it's [sic] spirit' (6 April 1840). Coleridge, for his part, had made a rather striking attempt to dissociate Bacon from his French admirers, notably Condorcet and other followers of Locke, by presenting Bacon as the "British Plato". Both great philosophers had been misunderstood: Plato never denied the importance of experience and, despite what the French *philosophes* said, Bacon had not rejected the contribution of ideas, of 'an intellectual or mental *initiative*' in arriving at scientific knowledge.[59] (It was this two-sided, or "antithetical", method that Coleridge proposed as the plan for the entire *Encyclopaedia Metropolitana* project, which was to replace the French Enlightenment encyclopedias, as well as the *Encyclopedia Britannica* and *Chamber's Cyclopedia*.)[60] 'Of Bacon's character as a man […] it is not my intention to speak', the 19-year old Ellis opened his text: 'It is as the author of the *Novum Organum* that I shall attempt to consider him'.[61] What followed were some twenty pages where Ellis took up a question he had already raised in his diary in 1834. It is typical for the nineteenth-century focus on Baconian scientific methodology that Ellis would himself help put in place as editor of the *Works*: is it possible to ascribe the progress of modern science to the inductive method? Does the *Novum organum* justify the claims set up on its behalf? Or, that is: 'Is the method of philosophizing advocated by Bacon the same as that which has led to our brilliant advancement in the natural sciences?'. The question is approached through an imaginary dialogue between Newton and Bacon. Rather than an open conversation, however, the dialogue essentially provides a list of reasons why Bacon's *idea* of scientific method cannot be reconciled with, and is even in conflict with, Newton's scientific *practice* (despite the famous *hypotheses non fingo* promise):

> He would assuredly deprecate the use of explanatory hypothesis; he would reject [the] guess that gravity may extend to the moon as an "*anticipatio mentis*"; […] he would deplore the absence of any system of "*prima philosophia*", the want of method, the neglect of tabulation; […] above all, he would complain that we reason too much, and observe too little.

Unlike others – Whately in the 1820s, Macaulay in the 1830s, Augustus De Morgan in the 1850s, etc. – Ellis did not point to Newton to abandon Bacon. Instead, he drew lessons from Newtonian practice to modernize Baconian theory. Since Bacon could not be blamed for the source of his mistakes – namely, 'the want of a real knowledge

[59] Samuel Taylor Coleridge, "General introduction, or, preliminary treatise on method," in *Encyclopaedia Metropolitana* I (London, 1817), 1–43, on p. 17.

[60] The *Encyclopaedia Metropolitana* (1817–1845) was very much a Trinity (Network) project; Coleridge provided the plan and, after being revived in 1820, three Trinity men, including Hugh James Rose, served as its editor. For context, see for example Judith Hawley, "'Encircling the arts and sciences': British encyclopedism after the French revolution," in D. Donald and F. O'Gorman, eds. *Ordering the World in the Eighteenth Century* (New York: Palgrave Macmillan, 2006), 216–244.

[61] Until indicated otherwise, all quotes that follow are from Ellis's 1838 declamation paper, with page numbers appearing between brackets in the main text. TCL, Add.Ms.c.67.132. For drafts of the essay see TCL, Add.Ms.c.67.133 (ff. 1–2).

of the history of any part of science' – this strategy seemed justified.[62] On the one hand, Ellis agreed with Bacon's attack on deductive syllogistic reasoning, writing that 'the subtlety of nature is far greater than the subtlety of logic' (7). It is impossible, even for Newton, to discover new truths about the world by following laws or rules describing how certain conclusions are to be drawn from given premises. In fact, 'truth is *sui generis* subject to no laws' (7) and the 'historical element' of knowledge cannot be neglected.[63] On the other hand, what Newton's practice also showed is that it is not by the systematization of observation that scientific discoveries are made. Ellis, echoing the Coleridgean language of *Guesses at Truth* – in a manner strikingly similar to Julius Hare's pupil Maurice's *The Kingdom of Christ*, also from 1838 –, believed that the history of science showed that this is done by strokes of brilliance, flashes of light and 'sparks of celestial fire' (11):

> [M]an's mind does not allow him to see into the mysteries of nature except in those fitful glimpses which occasionally visit the higher order of intellects and with a conviction of truth which they cannot communicate to others, nor justify to themselves. Still the light has shined, and by a deductive process we may verify what men call a simple hypothesis, by comparing the consequences which would flow from it with results of observation, and thus the intuition of genius is converted into the common property of mankind. (10-11)

What does it mean to incorporate the mental aspect of Newtonian practice into the Baconian inductive method? Ellis gave one example, touching on a topic that he would return to in his 1842 essay 'On the foundations of the theory of probabilities' (read before the *Cambridge Philosophical Society* in February and published in its transactions in 1844): the ground of induction, which is neither inductively nor deductively established but, as Ellis argued in opposition to the Lockean school of Condillac, *a priori*, relating to 'the constitution of the human mind' (13).[64] 'The authority of induction is founded on a *conviction* that the antecedent conditions being alike in two cases, the subsequent state will be so too' (12). This conviction is not the outcome of observations of a certain event or of the calculation of the degree of belief that it will happen again on the next instance. It results from the human mind's contemplation of 'all the cases under consideration', eventually recognizing – or, as Ellis writes, 'intuiting' – their 'entire similarity' (12–13). Ellis's position at this point echoed the Hares' notion of an 'idea' or 'divination of the whole' which allows an individual thinker to penetrate a given object much deeper than through the ordering and arranging any of its specific features.[65] Ellis's 1842 paper gave another example where this is brought out even more clearly. One notion central to the classical probability of Jacob Bernoulli, Pierre-Simon Laplace and others was the idea that an event will, on a long run of trials, tend to recur with frequency

[62] Robert Leslie Ellis to William Whewell, 11 October [probably late–1840s], TCL, Add. Ms.c.67/105.

[63] Robert Leslie Ellis to William Whewell, 11 October [probably 1842], TCL, Add.Ms.c.67/105.

[64] Robert Leslie Ellis, "On the foundations of the theory of probabilities (Read 14 February 1842)," *Transactions of the Cambridge Philosophical Society* 8 (1844): 1–6, on p. 1.

[65] Hare and Hare, *Guesses at Truth*, 377.

proportional to its probability. 'This is generally proved mathematically [by means of the law of large numbers]. It seems to me to be true *a priori*':

> When on a single trial we expect one event rather than another, we necessarily believe that on a series of similar trials the former event will occur more frequently than the latter. The connection between these two things seem to me to be an ultimate fact […], the evidence of which must rest upon an appeal to consciousness. Let any one endeavor to frame a case in which he may expect one event on a single trial, and yet believe that on a series of trials another will occur more frequently.[66]

Ellis called such beliefs 'axioms' – in a letter to Ellis, De Morgan spoke of "latent axioms": 'things which at first are not even credible, but which settle down into first principles' – and held them to be *a priori* truths, 'supplied by the mind itself'.[67] As Ellis would remark in a diary entry from August 1840, 'it is the characteristic of necessary truths to become intuitive to a mind familiarized to them' (26 August 1840).

Bacon had put too much emphasis on observation and too little on concepts; Plato *vice versa*. But both had recognized that knowledge was two-sided, as it always involved both the factual and the mental. Hence, in this crude sense, there was a connection to be made between Bacon and Plato (and Kant), at least according to Coleridge, Maurice and like-minded Trinity men.[68] Ellis knew of this connection; he referred to the rather idiosyncratic view of Bacon as the "British Plato" in his 1838 text, albeit critically. About a year later, however, he showed much more enthusiasm, noting in his diary on June 1839 that 'from what Coleridge says of the possibility of reconciling Plato & Bacon, I conjecture that he had a sounder view of Bacon's philosophy than is usual' (28 June 1839). (Ellis would return to this interpretation in the *Works*, where he, like Coleridge, wrote that abstract forms, rather than concrete phenomena, were the object of Bacon's philosophy.) Another month later, in July 1839, Ellis read Henry Hallam's (1777–1859) account of Bacon in his *Introduction to the Literature of Europe* (1837). Here, Hallam – the father of Arthur Henry Hallam, friend of James Spedding, Lord Tennyson and their Trinity set – spoke very highly of Bacon's philosophical writings, both of its style and content. Ellis appreciated Hallam's 'high recommendation of Bacon's *Essays*', adding that Bacon's mind was, indeed, 'all vigour' (25 July 1839).

Like so many of his contemporaries, by the late 1830s, Ellis was in two minds about Bacon: the *Novum Organum* was without a doubt 'a great work' (2), but also hopelessly flawed; and Bacon himself, 'the most brilliant writer on Philosophy', was 'rather admired than understood' (20). Ellis would draw what he saw as the

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[66] Ellis, "Foundations," 1–2.

[67] Ellis, "Foundations," 3; Augustus De Morgan to Robert Leslie Ellis, 24 June 1854, TCL, Add. Ms.c.67/111.

[68] Following Coleridge, Maurice, in his contribution to the *Encyclopaedia Metropolitana* ('Moral and Metaphysical Philosophy'), explicitly spoke of 'the connection between his [Bacon's] method and that of Plato'. F.D. Maurice, "Moral and metaphysical philosophy," E. Smedley and H.J. Rose, eds. *Encyclopaedia Metropolitana. Volume II [Pure Sciences, Vol. 2]* (London, 1845), 545–674, on p. 652.

only logical conclusion: Bacon's flaws should be remedied by a proper understanding of his oeuvre.

6.4 Ellis's Philosophy in the 1840s–50s

A few months after he graduated Senior Wrangler, in January 1840, Ellis sat the Trinity Fellowship examination, which included several questions on philosophy, among other topics; two on Plato, one on Aristotle and two more on Cicero.[69] His preparation for the philosophical part seems to have involved little more than studying some of Plato's dialogues, including the *Gorgias* and the *Theaetetus*, and reading Friedrich Schleiermacher's (1768–1834) *Introductions to Plato's Dialogues* ('I did not make much of it', 20 June 1840) and Johann Gottfried Stallbaum's (1793–1861) prolegomena attached to his edition of Plato.[70] But the very decision to want to obtain the Fellowship, to which he was duly elected on a first attempt in October of that year, was important, as it shows that Ellis had decided to make Cambridge his home. During the interim period, which he knew was 'a critical moment' (28 February 1840), he was without 'schemes of future life' (25 August 1840), living from day to day: he read some mathematics and philosophy, mostly ethics – often 'unable to fix on any subject, or follow out a single train of ideas' (28 February 1840) –, worked on 'some trifles' (28 March 1840) for the *Cambridge Mathematical Journal* (*CMJ*) and very occasionally scribbled notes on metaphysics (e.g. 29 March and 5 June 1840), none of which have survived.

The only project for which Ellis seems to have been able to enthuse himself in these months was that of turning the reflections on probability theory from his 1838 declamation into a paper for the *CMJ*.[71] It was the writing of what would become his 1842 paper 'On the foundations of the theory of probabilities' that led Ellis into his first intellectual exchange with Whewell, which would gradually turn into a collaboration. Ellis proposed the idea of an essay on probability to Duncan Farquharson Gregory (1813–1844) – one of the founders of the *CMJ* alongside

[69] The Trinity Fellowship examination took place in September 1840. From Ellis's diary it is clear that the candidates knew in advance which (chapters of) books to study. In his diary, Ellis speaks, among others things, of 'Whewell's two papers'; it is not entirely clear, however, whether these were different than the set examination questions. I am thankful to Jonathan Smith for providing me with the examination papers.

[70] Schleiermacher's *Einleitungen* (1804–1828) was translated into English by another Trinity Fellow, William Dobson. Schleiermacher attempted for the first time to establish a chronology of Plato's writings and to present a new view of Plato as a poet. Stallbaum prefixed prolegomena, written in Latin, to his *Platonis opera omnia* (1827–1860).

[71] See Stigler's chapter in this volume for a detailed account of Ellis's work on probability theory.

William Walton (1813–1901) – on 3 April 1840. A few days later, he received a letter from Walton, recommending him to wait for Whewell's *Philosophy of the Inductive Sciences* to appear before publishing on the subject. Ellis himself had already thought of writing to Whewell, which he did on 7 April, 'stating my notion of writing a little essay on probabilities, & asking if his work on the Philosophy of induction would interfere with it' (9 April 1840). Two days later, Ellis received 'a very civil answer': Whewell 'was very glad to hear of my intention & wished me to persevere as "he was sure I would throw light on it"' (9 April 1840). As Ellis wrote in his diary: 'Whewell's letter showed that one of the most arrogant of men of science is ready to acknowledge me as a fellow labourer in a favourite field of speculation' (9 April 1840). Ellis immediately set to work, writing on probability and reading Whewell's *Philosophy*, about which he soon concluded that 'very many of the views [expressed], are so far my own, that they have, more or less perfectly formed, passed through my own mind' (14 June 1840). A first version of the paper was completed in January 1842, when Ellis shared it with Whewell, saying that he was prepared to revise or change anything that Whewell saw fit.[72] Whewell, who himself wrote next to nothing on probability, approved of it and was instrumental in its delivery to the Cambridge Philosophical Society, where Ellis read it on 14 February. Whewell's approval was hardly surprising, as the paper was essentially an attempt to re-establish the foundations of probability theory on a Whewellian basis, that is, to reconcile it with 'a philosophy of science which recognizes ideal elements of knowledge, and which makes the process of induction depend on them'.[73] Ellis was by now a wholehearted public supporter of this philosophical position. A few months earlier, upon reading Berkeley's *De Motu* (1721) – where Newton's absolute space, time and motion are called into question –, he remarked: '[The book] is of little value, except as showing how enormous is the common cry of our natural philosophy being founded entirely on experience. A subtle enquirer into what experience really is, will either recognise the existence of principles in our knowledge not derived from experience, or will be led like Berkeley into destructive scepticism' (20 May 1841). It was in this same period that Ellis wondered whether his Kantian view on space and time might have influenced how Whewell wrote about the first law of motion in his *Philosophy*.[74]

There is no decisive evidence on when Ellis started working on Bacon. By 1847, he expected to have his part of the *Works* ready for the press within a year or so. The papers which he would hand over to Spedding in 1853 contained the 'General

[72] See Robert Leslie Ellis to William Whewell, 22 January 18(42?), TCL, Add.Ms.c.67/104. See also the diary entries for 7 March, 4 April and 9 April 1840.

[73] Ellis, "Foundations," 6.

[74] See the diary entry for 24 June 1841. The allegedly 'earlier' and 'later' view on the first law of motion which Ellis attributed to Whewell are found, respectively, in William Whewell, "On the truth of the laws of motion," *Transactions of the Cambridge Philosophical Society* 5 (1843): 149–172 and Whewell, *Philosophy*.

preface' (50 pages), some ten prefaces (about 90 pages in total), numerous notes and a selection of translations which together would 'give an English reader a complete view of the Baconian philosophy'.[75] Given the kind of expertise required – historical, bibliographical, scientific, philosophical – and the vast amount of literature needed to be read – from Bacon to Aristotle, from Leibniz to Vossius, from Plato to Paracelsus and from Sextus Empiricus to Thomas Aquinas – it is likely that Ellis started somewhere in the mid–1840s at the latest. By that time, his attitude towards Bacon must have been even more ambiguous than before. He had now embarked on a project dedicated to a philosopher whom he revered but whose oeuvre he found deeply flawed; in 1849, he travelled to the Continent to work on the *Novum organum*, a book he had denounced as being 'full of bad philosophy & impractical rules' (10 March 1841). And in the early 1850s, when he was already very ill, he was still eager to give at least some attention to Bacon. During the last years of his life, Ellis 'could not bear the subject of Bacon to be alluded to: if it happened to be introduced, he would say, "We don't talk about it in this room".[76] There evidently was something to Bacon that captivated him, that made him forgive him all his errors, and that gave him a motive to re-edit the Baconian corpus. Ellis himself offered a clue in his 'General preface' when he wrote that Bacon's 'merits 'belong to the spirit rather than to the positive precepts of his philosophy'.[77] This spirit was a religious vision of the aim of natural philosophy and of the unity of science and religion, of knowledge and faith:

> [Bacon] did good service when he declared, with all the weight of his authority and of his eloquence, that the true end of knowledge is the glory of the Creator and the relief of man's estate. When, not long before Bacon's time, philosophy freed itself from the tutelage of a dogmatic theology, it became a grave question how their respective claims to authority might be most fitly coordinated. It was to meet, perhaps rather to evade, this question, that the distinction between that which is true in philosophy and that which is true in religion was proposed and adopted. But it is difficult to believe that the mind of any sincere and truth-loving man was satisfied by this distinction. Bacon has emphatically condemned it. 'There is', he affirms, 'no such opposition between God's word and His works'. Both come from Him who is the Father of lights, the fountain of all truth, the author of all good; and both are therefore to be studied with diligence and humility.

There is some truth in the idea that this was also what Ellis, and like-minded Fellows of Trinity with him, 'wished earnestly to say […] to the men of his generation'.[78] What was distinctive about Ellis's religious-philosophical outlook was not its agreement with anything Bacon said, however; it was the Baconian spirit in which it disagreed with, and went over and beyond, Bacon. Ellis, like Whewell, introduced ideas as the basis of all inductive knowledge and, by that fact alone, found himself in a different position than Bacon vis-à-vis the unity of science and religion. Their

[75] Spedding, "History," xiv.

[76] Goodwin, "Biographical memoir," xxiv.

[77] Ellis, "General preface," 64.

[78] John Pilkington Norris, "*A Biographical Memoir of Robert Leslie Ellis*. By Harvey Goodwin," *The Athenaeum* 1900 (26 March 1864): 436–437, on p. 436.

non-Baconian task was to understand how it was possible that, in the progress of science, it turns out that human ideas correspond to the facts, and the facts to human ideas. And their non-Baconian answer was that, since both are of divine origin, they cannot but be in total agreement. Or, as Ellis, aged 38, formulated it in one of his last papers, of November 1854:

> Man in relation to the universe is not *spectator ab extra*, but in some sort a part of that which he contemplates […]. The thoughts we think are, it is true, ours, but so far as they are not mere error and confusion, so far as they have anything of truth and soundness, they are something and much more. […] In every science the fact and the idea correspond because the former is the realization of the latter, but as this realization is of necessity partial and incomplete […] this correspondence is but imperfect and approximate.[79]

[79] Robert Leslie Ellis, "Remarks on the fundamental principle of the theory of probabilities (Read 13 November 1854)," *Transactions of the Cambridge Philosophical Society* 9 (1854): 605–607, on p. 606. See Richards' chapter in this volume for context and background to Ellis's religious outlook.

Chapter 7
Robert Leslie Ellis: An Almost Perfect Moral Nature

Joan L. Richards

In her *Memoir of Augustus De Morgan*, Sophia De Morgan reported being struck by the 'almost perfect moral nature' of Robert Leslie Ellis when she met him when he was a student at Cambridge.[1] This may seem a somewhat odd assessment of the man. Ellis's biographer, Harvey Goodwin, certainly wanted to cast him in a positive light, but the man he described manifested few of the traditional external signs of holiness. Goodwin described Ellis as a man, who inherited a 'highly nervous constitution' from his mother.[2] As a child, he had few if any friends of his own age, which translated into a kind of earnestness that led him from the age of twelve to close diary entries with judgments of whether the day had been well spent.[3] By the time he was twenty, when he was not recording how many pages of mathematics he had read he was finding ultimate meanings, as when after a morning spent in town he came home alone – 'like many a man who goes to his long home – after losing all the sets of companions he was with in life' (4 March 1836). Among his fellow students at Cambridge Ellis displayed a 'kind of elderly sobriety of manner', that Goodwin was anxious to explain did not amount to 'stiffness,' but which certainly did not translate into warmth.[4] As an adult, he was an intellectual snob, who had no 'taste or any special fitness for imparting knowledge to average minds' or any minds

[1] Sophia Elizabeth De Morgan, *Memoir of Augustus De Morgan* (London: Longmans, Green, and Co, 1882), 103.

[2] Harvey Goodwin, "Biographical Memoir of Robert Leslie Ellis," in *The Mathematical and Other Writings of Robert Leslie Ellis*. William Walton, ed. (Cambridge: Deighton, Bell and Co, 1863), ix–xxxvi, on p. xii.

[3] For a treatment of Ellis's diaries see Stray's chapter in this volume.

[4] Goodwin, "Biographical memoir," xiv.

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L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0_7

except those of his small group of 'intimate friends'.[5] Goodwin hastened to add that among his small group of friends, Ellis 'possessed one of the most gentle of hearts' but that gentleness was not clear to most of the world.[6] What they saw was a man whose 'sense of honour and propriety was perfect; nothing shabby or mean could exist in the same place with Leslie Ellis'.[7] Try as he might, Goodwin found it difficult to portray Ellis as man who emanated transcendent love.

Sophia De Morgan certainly would not count among Ellis's "intimate friends"; she knew him only second-hand, as a colleague and occasional correspondent of her husband, Augustus De Morgan. Her assessment seems to have been based on the sickliness that characterized Ellis throughout his life. While still in his teens his education was repeatedly interrupted by illness, and his entrance into Cambridge was delayed for a year because of his health. While at Cambridge his eyes were so weak that he had to hire someone to read mathematical texts to him. At celebration after he finished first on the Tripos Ellis's fragility was on full display. Ellis described being led between college dignitaries, who 'made a lane with their maces', while 'my good friends of Trinity & elsewhere, two or three hundred men, began cheering most vehemently, and I reached the Vice's chair surrounded by waving handkerchiefs & most head rending shouts' (15 January 1840). Having been blessed and taken accustomed oaths of allegiance he then 'turned back, & walked slowly & stiffly down the Senate House' (15 January 1840) accompanied by more waves of applause. In response Ellis became so pale that he had to sit down and accept a bottle of salts sent to him by a young woman in the admiring throng crowd.[8] At the moment of his greatest triumph Ellis distinguished himself by almost fainting. Sophia's response to the sickly young man was typical of the ways Victorians responded to invalids like John Keats or Elizabeth Barrett Browning. But Ellis was neither a poet nor a woman. In the case of Ellis, the evidence of his moral character arguably lay chiefly in the facility with which he practiced mathematics.

Sophia's judgment draws attention to the interaction between the mental and the material that was singularly important for the English in the early nineteenth century. Andrew Warwick recognized this and explored the relation of the physical and the mathematical in a piece entitled 'Exercising the Student Body. Mathematics and Athleticism in Victorian Cambridge'.[9] Here, Warwick points out that the Tripos examination that marked the culmination of the undergraduate career in Ellis's Cambridge was as much a physical as a mental examination. Preparing for the

[5] Goodwin, "Biographical memoir," xx.

[6] Goodwin, "Biographical memoir," xxxiii.

[7] Goodwin, "Biographical memoir," xxxiii.

[8] See Part II ('Diaries') for Ellis's full examination diary.

[9] See, for example, Andrew Warwick, "Exercising the student body. Mathematics and athleticism in Victorian Cambridge," in Christopher Lawrence and Steven Shapin, eds. *Science Incarnate. Historical Embodiments of Natural Knowledge* (Chicago & London: The University of Chicago Press, 1998), 288–326. On the history of the Mathematical Tripos, see John Gascoigne, "Mathematics and meritocracy: the emergence of the Cambridge Mathematical Tripos," *Social Studies of Science* 14 (1984): 547–584.

examination was a gruelling process that required students to hire private tutors, who drilled them relentlessly in ways to solve the kinds of problems that appeared on the Tripos. The students learned a great deal of mathematics, but memorization and speed-writing were equally part of the preparation for a Tripos examination that rewarded those who could finish as many problems as possible in the time allotted. The examination itself was as much a physical as a mental challenge. The Tripos required students to be physically able to endure on the order of several (the number increased over time) successive many-hour days of examination in over-crowded under-heated halls in January. Under these conditions, Warwick has shown, the idea of a sound mind in a sound body took root in Cambridge. Some of the men who were strategizing with their coaches about how to answer questions quickly were also doing much to keep their bodies strong. Cambridge was filled with strapping young men like James Clerk Maxwell, who routinely ran up and downstairs as a break from his studies, or William Thomson, who was the stroke of the first Trinity college boat. These generations' experience of Tripos preparation formed the foundation for the development of athletics as essential support for high academic achievement.

Ellis certainly did not display a sound mind in a perfectly sound body. Nonetheless among his contemporaries he was universally hailed as a model of the type who would triumph on the Tripos. Goodwin, who came in second behind Ellis, remembered a friend commenting: 'If I had seen him before, I could have told you you could not beat him'.[10] Another, who observed his post-Tripos ceremony remarked, 'he looked very pale and ill, but this perhaps enhanced the intellectual beauty of his countenance'.[11] In the eyes of this observer, Ellis's sickliness was a mark of mathematical brilliance. Rather than marking him as feeble, his frailty served as the sign of a powerful intellect.

The mismatch between Ellis's world of ethereal intellect and Warwick's world of athletic wranglers runs deep. Ellis was cut from a different cloth than the strapping Maxwell and Thomson, not only corporeally and but mathematically as well. He was a representative of an eighteenth-century tradition that was only slowly being overtaken by the problem-oriented work of the Tripos. Warwick's athletic wranglers went on to pursue a form of mathematical physics that is characteristic of the late nineteenth-century English, but Ellis did not. For him, mathematics was more closely related to theology than it was to physics.

The foundation for Ellis's kind of theological mathematics lay deep. Within five years of the publication of the *Principia,* Newton told the Bishop of Westminster, Richard Bentley: "When I wrote my Treatise about our System, I had an Eye upon such Principles as might work with considering Men, for the Belief of a Diety'.[12] This was not an idle claim. Newton was so fully convinced that the laws he had

[10] Goodwin, "Biographical memoir," xvii.

[11] Goodwin, "Biographical memoir," xvii.

[12] Isaac Newton to Richard Bentley, 10 December 1692, quoted in Richard Thayer, ed. *Newton's Philosophy of Nature: Selections from His Writings* (Mineola, NY: Dover Publications, Inc., 2005), 46.

discovered mirrored the thought of the designer of the universe that at one point he claimed that the space he understood so completely corresponded to God Himself. 'Does it not appear from Phaenomena', he asked in the 28th Query to his *Opticks* 'that there is a Being incorporeal, living, omnipresent, who in infinite space, as it were in his sensory, sees the things themselves intimately and thoroughly perceives them, and comprehends them wholly by their immediate presence to himself?'.[13] Thus identifying the divine mind with physical space was not a position Newton could hold with any precision, but it shimmered in Anglican theology for centuries. Throughout the English nineteenth century, to think mathematically was to enter the mind of God.

This linkage between Newtonian mathematics and Anglican theology arguably constituted the justification for the Cambridge curriculum throughout the eighteenth and early nineteenth centuries.[14] When Ellis was a student, the Tripos was well on its way to being recognized as the most competitive mathematics examination in the world, but it was not designed to produce mathematicians. The competitive apparatus of training that Warwick so well described was very real, but at the same time, it was never truly embraced by the Cambridge establishment. The private tutors, who coached the most successful students through the examination, were not always members of the university. The athletic training that paralleled their efforts lay equally outside of the academic world. The Cambridge education was intended to produce clergymen. Whatever the reality of their Tripos experience, the mathematics that students learned was understood and defended by many as a means to this end.

Sophia knew the spiritual implications of Cambridge mathematics. She was not a mathematical thinker herself, but she was married to Augustus De Morgan and through her husband well aware of the basic parameters of the mathematical landscape in which Ellis worked. She was also aware that many challenges were threatening the stability of that landscape. In the first half of the nineteenth century, as the English were negotiating an industrial revolution that was leading them to the heights of imperial power, the nature of mathematics became a pressing issue. Throughout the eighteenth century, the success of Newtonian cosmology served the English as a guarantee that in mathematics they could align their thoughts with the mind of God and by so doing truly understand the world in which they lived. As they moved into the nineteenth century, however, this assurance of unity between the human and the divine was being challenged on many fronts. In the decades before Ellis entered Cambridge, George Peacock, who was to be Ellis's tutor, devoted himself to reaffirming the strength of the link between mathematical symbols and their referents in the context of algebra. By the time Ellis got to Cambridge in 1837, William Whewell and Augustus De Morgan were scrambling to respond to new

[13] Isaac Newton, *Opticks or A Treatise of the Reflections, Refractions, Inflections & Colours of Light* (New York: Dover Publications, Inc., 1979), 370.

[14] See, for example, John Gascoigne. *Cambridge in the Age of the Enlightenment: Science, Religion and Politics from the Restoration to the French Revolution* (Cambridge: Cambridge University Press, 1988).

French ideas of mathematical rigor that were further threatening to divide mathematical from divine understanding. In the decade after Ellis graduated, Whewell and De Morgan found themselves grappling with divisive continental understandings of the subjective and objective, while Ellis was pushing back against the Laplacian interpretation of probability theory that was driving a wedge between humans and their decision-making processes. All of these conversations might be said to have been part of a concerted effort to defend a world in which the human and the divine could work in concert with one another. Sophia's judgment of Ellis's character recognizes the role he and his life played in this larger discussion of the nature of mathematics and reality that gripped both of their worlds.

7.1 The Transcendence of Mathematical Knowing

That Cambridge mathematics was the centre of a theological education significantly shaped the subject there supported.[15] Newton's geometry was a representation of the space that was both the substratum of Euclidean geometry and the container of the universe. All of the definitions, axioms and proofs of geometry were essentially descriptive. Their validity lay in the absolute clarity with which they could be understood. Ultimately then, the truth of Newtonian mathematics rested on its meaning.

Newton's valorization of geometry essentially distinguished his work from that of his great rival, Gottfried Wilhelm Leibniz (1646–1716). Newton and Leibniz properly share the honours for having developed a set of techniques for calculating derivatives and integrals on the Cartesian plane, but their understandings of their work were radically different. Newton understood the calculus as the science of motion within a world of absolute, true mathematical time and space. In it, what we would call the "derivative," was the "ultimate velocity" of a "fluent," at a particular instant. Explaining how anything could be said to have a velocity at a particular moment—that is, could be moving without a change in time—was all but impossible. Newton nonetheless tried, in famously opaque passages like the one in which he explained that the derivative is to be understood as 'the ultimate ratio of evanescent quantities', that is, as 'the ratio of the quantities not before they vanish, nor afterwards, but with which they vanish'.[16] Newton represented this "ultimate velocity" or "fluxion" (or "derivative,") by placing a raised dot over the moving variable or "fluent" to produce $\dot{\mathbf{y}}$.

Leibniz, on the other hand, lived in an essentially non-continuous, atomistic world. For him, then, the spaces between discrete numbers on a continuous curve

[15] For a consideration of the ways natural theology was crucial to the grounding of mathematical and scientfic truths see Richard Yeo, "William Whewell, natural theology and the philosophy of science in mid-nineteenth century Britain," *Annals of Science* 36 (1979): 493–516.

[16] Isaac Newton, "Prime and Ultimate Ratios from *Principia*, Book 1," in Dirk Jan Struik, ed. *A Source Book in Mathematics, 1200–1800* (Cambridge, MA: MIT Press, 1969): 299–300.

were filled with infinitesimally small quantities, which he called "differentials," and represented as **dx, dy**, etc. Leibniz's differentials were so small that no amount of addition or multiplication could ever render them finite. However, since they comprised a universe of tininess in which relations were structured just like those among finite arithmetic numbers, the result of dividing one of Leibniz's infinitesimals by another one, was a finite number. For Leibniz the derivative was the ratio of two discrete infinitesimals, **dy/dx**.[17]

Over the course of the eighteenth century, the different sets of symbols Newton and Leibniz produced came to reflect a basic difference in the ways mathematics was perceived. Newton's dot notation remained as opaque as his explanations of it, and his symbols simply stood as markers for the ideas they represented. In this way, Newton's dot notation was very well suited to the theological context in which the eighteenth-century English pursued mathematics. For those to whom the calculus provided a glimpse into the mind of the Creator, the clumsiness of the dot notation could be seen as an advantage that required investigators to keep their focus on the transcendent reality that the symbols or the words were pointing at. The English embraced meditations upon the nature of "fluents," "evanescent quantities," or "ultimate velocities" as powerful spiritual exercises.

Leibniz's **dys** and **dxs** developed very differently. Virtually no one accepted Leibniz's interpretation of their meanings, but few could deny their effectiveness. Leibniz's algebraically nimble **dy**s and **dx**s could skip through all kinds of situations that were all but inaccessible to Newton's **ẏ**s. Continental analysts eagerly pursued them into whole areas—from multivariate calculus to differential equations—where the English could not follow.[18]

As the eighteenth century gave way to the 19th, the French revolution fundamentally changed mathematics in France. After the revolution, mathematical thinkers from all over Europe were gathered together to teach their subjects in the newly formed *École Polytechnique,* which was an engineering school in which the focus of mathematics lay in solving problems, not communing with God. in reading the scriptures.[19] Establishing a clear foundation for the calculus became a central concern for those who were trying to teach their subject to a new generation. In 1810, Sylvestre-François Lacroix (1765–1843) adopted a hybrid approach in his *Traité élémentaire de calcul differential et de calcul integral*. There he used Leibniz's **dy/dx** notation for solving problems, while using Newton's ideas of motion in an absolute time and space for justifying its results. It was not a totally satisfying position,

[17] Leibniz's infinitesimals have not been generally used since the early eighteenth century, but in 1966 Abraham Robinson showed that such a system could be developed following rigorous modern standards. Abraham Robinson, *Non-Standard Analysis* (Princeton: Princeton University Press, 1966).

[18] For a cogent presentation of the powers of Leibnizian symbology in historical context see Henk J. M. Bos, "Differentials, Higher-Order Differentials and the Derivative in the Leibnizian Calculus," *Archive for the History of the Exact Sciences* 14 (1974): 1–90.

[19] See Judith V. Grabiner, *The Origins of Cauchy's Rigorous Calculus* (Cambridge, MA: MIT Press, 1981).

but it worked, and more than 100 years of successful mathematical development supported his decision to trust to the basic solidity of the calculus without worrying too much about the strength of its foundations.

Even as the English closed ranks against the French politically and militarily, there were some who were intrigued by the ideas that emerged in the wake of the revolutionary upheavals. Among these was a Fellow of Gonville and Caius College, Robert Woodhouse (1773–1827), who was fascinated by the French discussions of mathematics. In 1803, Woodhouse published *The Principles of Analytic Calculation,* in which he tried to find a way to keep the mindfulness of English mathematics while embracing the power of **dy/dx** symbology. Mathematics he there declared, was best understood as an inductive science; just as scientific laws were formed by generalizing individual experiences, mathematical laws were found by generalizing individual results. It is more natural to treat 'the steps by which we ascend to expressions, more and more general, merely as so many improvements in the language of Analysis', he explained.[20] For him, the move from writing **(x + x + x)** to writing **3x** was an inductive one, as was the move from **(xxx)** to $\mathbf{x^3}$**.** All of these symbolic shifts could be useful as a way to streamline thought, but their validity rested always on the specific cases from which they were generalized. When approached in this way, the successful development of the **dy/dx** symbology was itself enough to legitimate its use.

Woodhouse's *Principles* put him in the somewhat odd position of entering a French discussion by means of an English book. But he was much more interested in opening his countrymen to continental conversations than he was in getting the French to engage with his arguments. Introducing his English colleagues to the Leibnizian **dy/dx** notation was essential to this part of his project because it was the only way that they could read French mathematical papers. Surely, he argued, it was 'desirable to have the same notation universally adopted, in order to facilitate the communication of science between different nations'.[21] Whatever one's view of the foundations of the calculus, Woodhouse was convinced that using the **dy/dx** notation was the best way to bring together the worlds of English and continental mathematics that he believed had been divided for far too long.

Woodhouse's *Principles* was a far too radical a work to have any effect on the ways mathematics was taught at Cambridge without considerable political manoeuvring of a kind Woodhouse was not suited for. The credit for actually introducing the **dy/dx** notation to the English goes to a group of young men who arrived at Cambridge eight years after he had abandoned the effort. Charles Babbage, John Herschel, and George Peacock were the founding core of what they called the Analytical Society; the slightly younger William Whewell joined them in 1812. Their goal was to advance 'the Principles of pure D-ism'—that is, the Leibnizian

[20] Robert Woodhouse, *The Principles of Analytic Calculation* (Cambridge, 1803), xxv.

[21] These words are from Robert Woodhouse, "Review of La Croix, S. F., *Traité Du Calcul Differentiel*, &c.; i.e. *A Treatise on the Differential and Integral Calculus*," *Monthly Review; or Literary Journal* 31 (1800): 494–95. He repeated the point, though less succinctly, in the "Preface" to Woodhouse, *Principles*.

dy/dx notation— 'in opposition to the Dot-age of the University'—that is, the Newtonian dot notation.[22] The young men of the Analytical Society were determined to bring French mathematics into Cambridge and, thereby, to challenge some of the theological parameters of their *alma mater*, preferring analytical rigour over traditional authority.

Translating Lacroix's *Traité élémentaire* for the benefit of Cambridge undergraduates was one of the group's central ambitions. Babbage and Herschel left Cambridge before it was accomplished, but in 1816 Peacock published an English translation of Lacroix's text. There was a difference, however. Although Babbage once proclaimed Lacroix's text to be "so perfect that any comment was unnecessary," the English version of the work was attended by copious revisionary commentary. In footnote after footnote, Peacock insisted on the neo-Baconian generalizing of Woodhouse's *Principles of Analysis* as a corrective to Lacroix's approach.[23] Peacock's translation of Lacroix is an early example of a what was to be a whole series of negotiations in which the English insisted on engaging French ideas on their own terms.

In the case of Peacock's Lacroix translation, the result is at once strange and an accurate reflection of its moment. At the beginning of the 1820s, no one—whether French or English—was entirely clear about how to understand the nature of the mathematics that they were pursuing. Peacock was uncomfortably aware of this, and having done what he could to explain the nature of the calculus, he turned his attention to an understanding the foundations of algebra, which was ground zero for the problem of symbols in mathematics.

7.2 Maintaining Transcendence Through History

Mathematics is rightly a plural word, and Newton's identification of mathematical thinking with the mind of God was rooted in only one part of it. His meaning-based understanding of mathematics came naturally to the classical study of Euclidean geometry, but was seriously strained in the new subject of algebra that was developed over the course of the seventeenth century. The whole power of algebraic mathematics lay in the flexible ways it could move over different subject matters. The English held to the view that algebra was a meaningful mathematics, whose

[22] Charles Babbage, *Passages from the Life of a Philosopher*. Martin Campbell-Kelly, ed. (New Brunswick: Rutgers University Press, 1994), 21.

[23] For a fuller discussion of the issues that divided Lacroix from his English translators see Joan L. Richards, "Rigor and clarity: foundations of mathematics in France and England: 1800–1840," *Science in Context* 4 (1991): 297–319. For different analyses of the dynamics within the Analytical Society see Harvey Becher, "Radicals, Whigs and Conservatives: The middle and lower classes in the Analytical Revolution at Cambridge in the Age of Aristocracy," *The British Society for the History of Science* 28 (1995): 405–26 and William J Ashworth, "Memory, efficiency, and symbolic analysis: Charles Babbage, John Herschel, and the industrial mind," *Isis* 87 (1996): 629–53.

subject matter was number. At the end of the eighteenth century some radicals carried this conviction so far as to deny the validity of negative numbers, which were not part of the classical Greek concept of positive counting numbers. Few were willing to go to that extreme, but the problem it highlighted was very real. In the years before Ellis arrived in Cambridge, his tutor, George Peacock, had struggled with the problem of negative numbers in algebra. By the time Ellis matriculated, Peacock had found a way to legitimate negative numbers while preserving the essential link between mathematical symbols and their referents that was the cornerstone of English religion-inspired mathematics.

Peacock took an empirical approach to his challenge. Over the course of the 1820s, he carefully examined reports of different mathematical systems that English explorers were encountering as they confronted various cultures around the world. Some sense of the breadth of his thinking may be surmised from the titles of the papers he presented to the Cambridge Philosophical Society, which had in 1819 arisen from the ashes of the Analytical Society: "Greek arithmetical notation"; "On the Origin of Arabic numerals and the date of their introduction in Europe"; "On the numerals of the South American languages".[24] Peacock's explorations of non-western views of number changed his understanding of mathematics dramatically. In an 1829 article "Arithmetic" published in the *Encyclopedia Metropolitana*, he showed how all of the diverse mathematical systems he had read about fit into an enormous pattern of progressive development. From that perspective, the concept of number articulated by the ancient Greeks represented just a particular slice of time in an enormous historical process.

Having devoted a decade to mapping the ways the concept of number had developed all over the world, Peacock was ready to turn his attention to the nature of the algebra that had grown out of that concept. In *A Treatise on Algebra,* published in 1830, he resolved the problem of negative numbers by embedding it in the same kind of progressive narrative he had so carefully mapped out in arithmetic. Algebra, he there declared, had developed through two major stages. In the first, arithmetic equations like $\mathbf{4^2 - 3^2 = (4–3)\,(4 + 3),}$ were generalized into the form $\mathbf{a^2 - b^2 = (a + b)\,(a - b)}$ for $\mathbf{a \geq b}$. In the second stage, such equations were further generalized by dropping the restriction that $\mathbf{a \geq b.}$ Removing this restriction immediately opened the possibility that **b** was larger than **a,** and thereby created negative numbers. That these numbers had consistently yielded true results over the course of 200 years supported his conclusion that the negative numbers were valid.

Having laid out this historical narrative, Peacock enshrined his conviction that it reflected a universal truth in what he called the "Principle of Equivalent Forms." He worded this principle somewhat differently at different times, but the following may

[24] See Kevin Lambert, "A natural history of mathematics: George Peacock and the making of English algebra," *Isis* 104 (2013): 278–302. The historical literature focused on the development of English ideas of algebra in the early decades of the nineteenth century is simply enormous. For the moment, I recommend following the footnotes in this excellent and relatively recent article as an entrée into that literature.

be taken as a basic statement of it: 'Whatever equivalent form is discoverable […] when the symbols are general in their form though specific in their value, [e.g. $\mathbf{a^2 - b^2 = (a+b)(a-b)}$ for $\mathbf{a \geq b}$] will continue to be an equivalent form when the symbols are general in their nature as well as in their form [e.g. $\mathbf{a^2 - b^2 = (a+b)(a-b)}$]'.[25] Translated into everyday language, Peacock's "Principle of Equivalent Forms" asserted that any algebraic equation that had been generalized from a legitimate arithmetic one was valid, even when it was not immediately clear what that equation meant.

Peacock's principle fundamentally shifted the English view of mathematics. Accepting it entailed resting the validity of algebraic results on the process through which equations were generated, rather than on the meanings of the symbols in those equations. For Peacock, the pattern of development he had traced through number systems all over the world more than adequately demonstrated that algebraic meanings would eventually become clear. In the meantime, he offered his principle as a guide and an assurance of the validity of algebraic results.

Peacock was Ellis's tutor at Cambridge, and Ellis completely embraced the older man's vision of algebra. In 1838, while still an undergraduate, Ellis joined with the recently graduated Duncan F. Gregory, who created the *Cambridge Mathematical Journal,* in which Gregory published an impressive series of articles on algebra. Gregory, it appears, was as physically frail as was Ellis. When Gregory died in 1844 at the age of thirty-one, a saddened Ellis wrote the "Biographical memoir" that serves as the introduction to Gregory's collected works.

Ellis's presentation of Gregory's work powerfully captures one aspect of the view of mathematical knowing that flowed from Peacock's algebra. Ellis there characterized Peacock's insight as recognizing that 'theorems proved to be true of combinations of ordinary symbols of quantity, might be applied by analogy to the differential calculus and to that of finite differences. The meaning and interpretation of such theorems would of course be wholly changed by this kind of transfer from one part of mathematics to another, but their form would remain unchanged'.[26] At first, mathematical thinkers regarded these analogies to be merely suggestive, Ellis explained. But over time, he continued, mathematical thinkers moved from the sense that results generated in this way were merely suggestive, that they required further proof, to the recognition that 'these theorems are true, in virtue of certain fundamental laws of combination, which hold both for algebraical symbols, and for those peculiar to the higher branches of mathematics'.[27] As a result, he went on 'each algebraical theorem, and its analogue constitute, in fact, only one and the same theorem', and 'therefore a demonstration of either is in reality a demonstration

[25] George Peacock. "Report on the recent progress and present state of certain branches of analysis," *Report of the Third Meeting of the British Association for the Advancement of Science* (1833): 185–352, on p. 198–99.

[26] Robert Leslie Ellis, "Biographical Memoir of Duncan Farquharson Gregory," in *The Mathematical Writings of Duncan Farquharson Gregory*. William Walton, ed. (Cambridge: Deighton, Bell and co., 1865), xi–xxiv, on p. xv.

[27] Ellis, "Biographical memoir," xvi.

of both'.[28] Ellis did not here explicitly refer to Peacock, but the position he was laying out may be seen as a rewording of Peacock's Principle of Equivalent forms.[29]

Ellis remained as vague as Peacock had been about the basis for his conviction that results established using algebraic symbols generated from arithmetic, would be equally true using the symbols of calculus or differential equations. The closest he could come was to attribute their apprehension to 'a peculiar faculty—a kind of mental *disinvoltura* which is by no means common'.[30] Ellis's use of the Italian term *disinvoltura* here, instead of self-assurance or lack of constraint, signals that he is reaching to capture something that transcends the bounds of everyday English. In this case, Gregory's "mental *disinvoltura*" meant that he 'at once perceived the truth and the importance' of the identity of the forms of algebra with those of higher subjects and charged ahead 'with singular facility and fearlessness'.[31] From Ellis's perspective, the results Gregory developed were important, but seeing his thinking in action was even more so. 'The steady and unwavering apprehension of the fundamental principle which pervades all these applications of it, gives them a value quite independent of that which arises from the facility of the methods of solution which they suggest'.[32] For Ellis, Gregory served as a living example of a mind who had the grace to see truth immediately. The gleeful *disinvoltura* with which he approached his work was itself sufficient evidence of the truth of his results.

However much Ellis admired the exuberant self-confidence with which Gregory approached mathematics, he did not display it himself. His contemporary biographer, Goodwin recognized the deep connection and friendship between Ellis and Gregory, but noted that 'neither in mind nor in manner was there much likeness between them'.[33] There is certainly no hint of *disinvoltura* in the picture of Ellis that Goodwin there painted. Ellis was no less engaged in Peacock's transcendent world than Gregory was, but he did not fearlessly rush into it. He did a certain amount of algebra, but was always more interested in connecting his work with that of the past, than he was to 'press forward knowledge upon that one line'.[34] What delighted him was 'to discuss the principles of investigations already known, to trace the history of processes, to examine the philosophy of a subject, to hunt up its literature, or to simplify its treatment'.[35] In this Ellis was picking up on a different facet of Peacock's

[28] Ellis, "Biographical memoir," xv-xvi.

[29] For an account of Ellis's generation's reworking of Peacock's symbolical algebra see, for example, Lukas M. Verburgt. "Duncan F. Gregory, William Walton and the development of British algebra: 'algebraical geometry', 'geometrical algebra', abstraction," *Annals of Science* 73:1 (2016): 40–67.

[30] Ellis, "Biographical memoir," xvi.

[31] *The Book of Common Prayer, and Administration of the Sacraments and Other Rites and Ceremonies of the Church, According to the Us of the Church of England, Together with the Psalter or Psalms of David* (Oxford: Clarendon Press, 1799), xvi.

[32] Ellis, "Biographical memoir," xvii.

[33] Goodwin, "Biographical memoir," xviii, n.

[34] Goodwin, "Biographical memoir," xxix.

[35] Goodwin, "Biographical memoir," xxix.

mathematics. Ellis's joy in mathematics lay the subject's essential connections with the whole history of humankind.

Ellis was not alone in his world-opening view of the history of mathematics. Peacock was lifted out of Cambridge to become Dean in Ely Cathedral while Ellis was still a student, but another of the Analytics remained. William Whewell devoted his life to developing Peacock's kind of historical view of mathematics both in philosophy and in the Cambridge curriculum. By the time Ellis arrived in Cambridge almost 20 years had passed since Peacock published his peculiarly English version of Lacroix's text. In the interim the **dy/dx** symbology had become standard on the Tripos examination, but the understandings of the subject remained mired somewhere in the conceptual mud of Newton's *evanescent quantities*, the empty symbolism of Leibniz's **dy/dx** s, or some poorly defined 'mixture of the two'.[36] In 1836, the year before Ellis arrived in Cambridge, William Whewell returned to the question. In "Thoughts on the study of mathematics as a part of a liberal education", he declared himself ready to break out of this box by asserting that the 'real fundamental principle' on which the Calculus rested was 'the conception of a *Limit*'.[37] Neither Lacroix nor Peacock would ever have claimed this. But much had happened in the decade and a half that stood between Peacock's translation of Lacroix's text, and Ellis's entry into Cambridge. Whewell's proclamation was pointing the way to a major change.

Whewell's talk of the limit signaled his recognition of the work of the Frenchman Augustin Cauchy, who in an 1821 textbook entitled *Cours d'Analyse* (*Course of Analysis*), claimed to have finally established the true foundation of the Calculus. Key to Cauchy's approach was a breathtakingly crisp three pages, in which he formulated a series of definitions. There, "*numbers*" became 'the absolute measures of magnitudes', "*quantities*" became *numbers* preceded by the signs + or -'; and "*variables*" became '*quantities* that can be considered as able to take on successively many different values'.[38] In this context, "*the limit*" became the "fixed value" that is approached when 'the values successively attributed to a particular *variable* end up by differing from it by as little as we wish'.[39] The limit thus defined established the critically important definitions of the *infinitesimal* as a *variable* whose successive values fall below any given number, and the *infinite* as the *limit* obtained 'when the successive numerical values of a given variable increase more and more in such a way as to rise above any given number'.[40] Cauchy's definitions did not capture the richness of the ways the words had been used for centuries, but they had the

[36] Anonymous. [Augustus De Morgan], "Limit," *Penny Cyclopædia* 13 (Intestines-Limoges) (London, 1839): 496–497, on p. 497.

[37] William Whewell, "Thoughts on the study of mathematics as a part of a Liberal Education," in *On the Principles of English University Education* (London: John W. Parker, 1838): 135–176, on p. 149.

[38] Augustin-Louis Cauchy, *Cauchy's* Cours d'analyse*: An Annotated Translation*. Edited and translated by Robert E Bradley and Edward C Sandifer (New York: Springer, 2009), 7.

[39] Cauchy, *Cours d'analyse*, 7.

[40] Cauchy, *Cours d'analyse*, 7.

advantage of being both individually clear and mutually dependent. They were, in addition, briskly practical; so, for example, his definition of the infinite provided a straightforward way to decide whether a variable was infinite or not. Tightly interwoven with one another, these clear, operational definitions formed a net strong enough to support virtually all of the analytic results of the previous century. And for Cauchy, that was enough. 'In establishing precisely the meaning of the notation that I will be using, I will make all uncertainty disappear', he crowed.[41]

Others were distinctly less enthusiastic. Cauchy's French colleagues clearly recognized that embracing his definitions entailed abandoning the enlightenment view of reason that had been modelled on the clear thinking of Euclid's geometry throughout the eighteenth century. Cauchy knew this, but he didn't care. He was a leader of the post-Napoleonic reaction that swept a generation of Enlightenment mathematicians from their posts at the *École Polytechnique*. In the "Introduction" to his *Cours,* the counter-revolutionary dispensed with his predecessors' enlightenment ideals in a sentence as brief as his definitions: 'Let us cultivate with ardour the mathematical sciences, without wishing to extend them beyond their domain; and let us not imagine that we can attack history with formulas nor that we can offer the theorems of algebra or of integral calculus as moral training'.[42] Thus relinquishing all of mathematics' claims to be an essentially humanistic subject did not trouble him. He was an ultra-conservative Catholic who through truth was to be found through revelation and the authority of the Church, not through some form of mathematical reasoning.

Cauchy's rigorous approach was as unacceptable to the subject that lay at the heart of liberal education at Cambridge as it was to the mathematical thinkers of the French enlightenment. Nonetheless, the efficacy of his methods was so impressive that within fifteen years even Whewell was being forced to recognize it. As he did so, however, the Cambridge don rejected the rigorous austerity of Cauchy's definitional approach. The *limit*, Whewell explained, may be approached through abstract definitions or intuitive axioms or some combination of the two, but 'whatever course is taken, the foundation on which our conclusions rest is the idea itself'.[43] When Whewell identified the limit as the "real fundamental principle" of the calculus, he was claiming that it could be conceived as clearly as a geometrical theorem could.

Whewell did not further develop this idea, but over the course of 5 years, from 1836 to 1841, De Morgan took up Whewell's challenge to translate the operational power of Cauchy's limit into a properly English mathematics of transcendent truth. De Morgan may be seen as standing chronologically half-way between Ellis and the Analytics. Like Ellis he was powerfully influenced by Peacock, and resisted the problem-driven mathematics of the Tripos. In response to Whewell's call De Morgan

[41] Cauchy, *Cours d'analyse*, 2.

[42] Cauchy, *Cours d'analyse*, 3 I have diverged from the Bradley and Sandifer translation for the second half of this sentence. They rendered Cauchy's *"ni donner pour sanction à la morale des théorèmes d'algebre out de calcul integral"* as "nor to make moral judgements the theorems of algebra or of integral calculus."

[43] Whewell, "Thoughts," 149.

began work on a series of one-shilling pamphlets that were then compiled into a single 785-page volume entitled *Differential and Integral Calculus* in 1842.[44]

An essential point that distinguished De Morgan's *Calculus* from Cauchy's *Cours* lay in the nature of definitions. For Cauchy, definitions were fixed points that defined the limits of mathematical legitimacy; for De Morgan, they were constantly negotiable way-stations on the path to full understanding. De Morgan had learned from Peacock that mathematical understandings grew organically from murky darkness to blinding new insights. This meant that the true mathematician would be always on the look-out for ways to explore, develop, and expand the definitions of his subject to be sure they were large enough to include all possible scenarios. He insisted that allowing definitions to fix the boundaries of the legitimate and the illegitimate was a sure way to impede mathematical progress.

Adjusting the certainties of Cauchy's rigorous definitions to accommodate the richness of De Morgan's historically grounded ones was a challenge. It took De Morgan five pages to cover the ideas of magnitude and number Cauchy covered in two sentences, more than ten pages to elucidate the definition of the limit that Cauchy had laid out in two neat lines, and another twelve pages to recognize the many intricately intertwined meanings of infinitesimal and infinity. As De Morgan twisted his way through one tortuous example after another, he explained that the convolutions 'are not unimportant' because 'it is of great consequence that the fundamental notions of mathematics' should be presented using 'the rude and unrigorous form in which they are expressed in common life'.[45] Even when he finally declared on his twenty-seventh page that 'in future we shall use the theory of limits in all reasonings', he promised to bracket the paragraphs in which he did so to signal that this was just a temporary nod to convenience.[46] For De Morgan, as for Ellis, the true mark of legitimate mathematical understanding was the soil of human history that clung to its roots. Learning mathematics was only valuable when it lifted the mind to contemplate a transcendent reality that lay beyond any artificially constructed set of confining definitions.

[44] Augustus De Morgan, *The Differential and Integral Calculus*, Library of Useful Knowledge (London: Baldwin and Cradock, 1842).

[45] This quotation is from De Morgan's anonymous article "Limit" in the *Penny Cyclopedia,* 13 (1839). He made the same point, though less neatly in his *Calculus:* 'Our object is to show that there is no great refinement or abstruseness in the nature of the fundamental ideas of the science; but that they do, in fact, suggest themselves in cases which occur in common life'. De Morgan, *Calculus*, 27.

[46] De Morgan, *Calculus*, 27.

7.3 Defending Transcendent Truth

For modern historians, Whewell and De Morgan's collaboration on the calculus may seem strange. Whewell was a high Tory Anglican who devoted his life to defending the elitist education of Cambridge University, while De Morgan was a radical religious dissenter who taught mathematics at the secular University College London. Their collaboration on the calculus points up that the whole structure of their political and religious differences was rooted in a single English ideal of transcendent mathematical truth. Whewell and De Morgan disagreed, often fiercely, about any number of issues of their day, but it was not at all difficult for them to join forces against threats from abroad. Ellis, who was a moderate Whig, agreed completely.

The depth of these Englishmen's agreement is reflected in their response to yet another foreign threat. In the decade after Ellis emerged from the Tripos the English confronted yet another, even more fundamental threat to their transcendent view of mathematical understanding. For De Morgan the issue arose in the context of logic. For Whewell it was a philosophical challenge. For Ellis it proclaimed itself in probability theory. For all of them, finding the proper response to an emerging opposition between the individualistic subjective experience and the external objective world brought out their most passionately articulate defences of the transcendent truth of their mathematical worlds.

De Morgan spent the 1840s immersed in the Aristotelian logical tradition in which these two terms were well understood. There the term "subjective" referred to the subject of a proposition like "All men are mortal," while the term "objective" referred to its object or predicate. In this format, the subject "men" was the most concrete, essentially real part of the proposition, while the object "mortal" was considered less real because it existed only in relation to the subject.

De Morgan was completely comfortable with these traditional meanings, but as he was drawing his thoughts together into a book, he realized they were being undermined in the world around him. So, in October of 1846 he opened a correspondence in which he asked Whewell to provide him with 'two words to supply the place of subjective and objective'.[47] The challenge that led De Morgan to this question may be neatly located in an article George Lewes wrote for the *Penny Cyclopædia.* In the article "Subject, Subjective" Lewes declared his determination to introduce the terms subjective and objective 'to English philosophical language, through the medium of the German writers'.[48] He then explained that from that German point of view, 'the Subject is in philosophy invariably used to express the mind, soul, or personality of the thinker—the Ego. The Object is its correlative, and uniformly expresses anything or everything external to the mind; everything or anything distinct from it—the non-Ego'.[49] In an effort to appear less foreign, Lewes

[47] Augustus De Morgan to William Whewell, 3 October 1846. TCL, Add.Ms.a.202/104.

[48] [George Lewes], "Subject, Subjective," *Penny Cyclopedia* 23 (Stearic Acid-Tagus) (1842), 185–186, on p. 185.

[49] [Lewes], "Subject, Subjective," 185.

claimed that these were the original meanings of the words, which had then been muddied and confused by centuries of loose usage He then credited Kant with having developed these definitions in response to a century of continental adjustment to the rise of scientific thinking.[50]

De Morgan was in no position to question the validity of Lewes' interpretation of German philosophy. 'I stop at Kant, whom I spell with a c and an apostrophe: I c'an't get through him', he quipped.[51] But he did have to come to grips with the meanings of "subjective" and "objective" that the younger man was insisting upon. Those meanings were so alien to his English world that he said 'people tell me they are always obliged to find out the meanings of these words afresh, every time they come to the subject. And this I find in my own case', he complained.[52] Two days later he was still whining: 'Is it likely that the ordinary antitheses of language should express an antithesis which people in general never think of?'.[53] Nonetheless, De Morgan turned to Whewell for help partly because he did not want to appear ignorant by using the words in a way that was outmoded and partly because Whewell was a known word-coiner (e.g. 'scientist').

De Morgan's problem lay in the ways Lewes' definition separated the individual knower from what was known. He was simply not able to accept a construction that insisted on distinguishing between ideas and experiences in a way that gave no credence to the experience of communion that marked moments of true understanding. After several days of struggle, he decided that the 'ideal and objective is the important distinction in practice'.[54] Replacing the ego-limited term "subjective," with "ideal" was De Morgan's way of maintaining the ultimate validity of the experience of understanding the true nature of the world.

Whewell had no trouble understanding De Morgan's resistance to dividing experience into the subjective and objective. By the time De Morgan was asking him about the definitions of these terms, he had come to see that some form of this split was a precondition of the philosophy that was coming into England from abroad. In a paper he sent in response to De Morgan's questions, Whewell had identified a whole list of oppositions—form vs. matter, theory vs. fact, necessary vs. contingent, subjective vs. objective—as "fundamental antitheses" that lay at the base of continental philosophy. All of these distinctions made Whewell as uncomfortable as they did De Morgan, because one after another they drove wedges between the fusion of words and meanings that supported the Newtonian natural theology. Although continental philosophers considered 'these elements of knowledge separately, they cannot really be separated', Whewell insisted.[55] On the one hand he admitted,

[50] Actually, the Kantian use of "objective" and "subjective" was not the same as the one Lewes set out.

[51] Augustus De Morgan to William Whewell, 1 March 1849, TCL, Add.MS.a.202/113.

[52] Augustus De Morgan to William Whewell, 21 October 1846, TCL, Add.Ms.a.202/106.

[53] Augustus De Morgan to William Whewell, 5 October 1846, TCL, Add.Ms.a.202/105.

[54] Augustus De Morgan to William Whewell, 5 October 1846, TCL, Add.Ms.a.202/105.

[55] William Whewell, "On the fundamental antithesis of philosophy. (Read Feb 5, 1844)," *Transactions of the Cambridge Philosophical Society* 8 (Part II) (1849): 170–182, on p. 172.

'Knowledge requires ideas. Reality requires things. Ideas and things coexist'; nonetheless, he continued, 'Truth', which entails merging these oppositions, '*is* and is known'.[56] At a loss as to how to make sense of this contradictory situation, Whewell was forced to conclude that 'the complete explanation of these points appears to be beyond our reach'.[57] Thus, even as Whewell tried to help De Morgan understand the modern meaning of the terms subjective and objective, the two men agreed that they were foreign concepts. They saw the necessity of becoming familiar with them, in order to participate intelligently in the conversations of continental philosophers. But in their English world, real understanding transcended the antitheses of form and matter, subjective and objective, ideas and things, words and meanings.

Ellis was not privy to the specifics of De Morgan and Whewell's struggle with the objective and subjective, but he was equally resistant to continental forms of dichotomous thinking. His particular bugaboo was Pierre Simon-Laplace, who in his 1814 *Essai philosophique sur les probabilités* essentially located all of epistemology within the theory of probabilities.[58] Since most of our knowledge is only probable, Laplace wrote in his first paragraph, all of the most important problems we face turn on questions of probability. And so, he concluded, 'the whole system of human knowledge is tied up with the theory set out in this essay'.[59] From this beginning, Laplace turned to calculating probabilities in evermore complex situations, in order to reach rational conclusions. As he did so, Laplace recognized that seemingly rational people often differ in their opinions, but he say these individual differences as failures of reason, which could and should be eliminated by the determined application of an increasingly sophisticated probability theory. To reach the right conclusion requires 'great precision of mind, a nice judgement, and wide experience in worldly affairs', he explained: 'It is necessary to know how to guard oneself against prejudice, against illusions of fear and hope, and against those treacherous notions of success and happiness with which most men lull their *amour-propre*'.[60] For Laplace, truly rational decision making required standing outside of the situation.

Laplace's view of decision-making was thus diametrically opposed to the one embedded in the Cambridge mathematical education. Instead of recognizing the power of the human knower, he located decision-making in an extra-human set of mathematical procedures. For the Frenchman, coming to a true understanding entailed a process of separation not of communion.

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[56] William Whewell, "Remarks on a review of *The Philosophy of the Inductive Sciences* (Appendix F)," in *On the Philosophy of Discovery* (London: John W. Parker and Son, 1860): 482–491, on p. 489.

[57] Whewell, "Remarks," 489. Augustus De Morgan cited this passage from Whewell's "Remarks" in his *Formal Logic* (London: Taylor and Walton, 1847), 33.

[58] For Ellis on probability theory see Stigler's chapter in this volume.

[59] Pierre-Simon Laplace, *Philosophical Essay on Probabilities*, 5th edition. Translated by Andrew I. Dale (New York: Springer-Verlag, 1995), 1.

[60] Laplace, *Probabilities*, 12.

Ellis devoted one of his first published papers to countering Laplace's divisiveness. In an 1842 paper "On the foundations of the theory of probabilities" he pointed out that Laplace's position was 'in direct opposition to the views of the nature of knowledge, generally adopted at present.'[61] Laplace's mathematics did not really provide a platform from which to make decisions, because it was erected on a fundamental fallacy. All of Laplacean probability theory rested on the premise that any particular decision could be separated from its particular circumstances, but this kind of separation was impossible in practice. Ellis found Laplace's probability theory to be an elaborate construction designed to give a mathematical form to conclusions that were always already embedded in the particular circumstances of the case.

In 1854, Ellis wrote a second paper on probability theory, where he again insisted that Laplace's effort to divide the knowing person from the things that are known is at once artificial and pernicious. 'Man in relation to the universe is not *spectator ab extra* [observer from the outside], but in some sense a part of that which he contemplates,' Ellis there insisted.[62] We do not sit outside of life's possibilities like entrants in a raffle. We do not calculate the odds as we move through our days. Life's possibilities are us and we are them; we are in their midst at all times.

Ellis moved from this position to confront the forces of separation that De Morgan and Whewell had wrestled with in the opposition between the subjective and the objective eight years before. In an elegant two sentences the younger man laid out the position they had struggled to articulate. 'The thoughts we think are, it is true, ours,' Ellis explained, 'but so far as they are not mere error and confusion, so far as they have anything of truth and soundness, they are something and much more. The *veritas essendi* [essential truth] […] is the fountain from whence the *veritas cognoscendi* [known truth] is derived'.[63] Here again Ellis's use of Latin signals he was moving beyond the plane of everyday language to embrace the transcendent. The relation between the *veritas essendi* and *veritas cognoscendi* was what De Morgan was trying to capture when he suggested replacing the term "subjective" with the term "ideal". The flowing waters of his fountain captured the essence of Whewell's mighty, but shimmering "Truth".

[61] Robert Leslie Ellis, "On the foundations of the theory of probabilities. (Read 14 February 1842)," *Transactions of the Cambridge Philosophical Society* 8 (1844): 1–6, on p. 1.

[62] Robert Leslie Ellis, "Remarks on the fundamental principle of the theory of probabilities. (Read 13 November 1854]," *Transactions of the Cambridge Philosophical Society* 9 (1856): 605–607, on p. 606.

[63] Ellis, "Remarks," 606.

7.4 Conclusion

Ellis was under considerable duress when he was contemplating about fountain of truth. Eight years before, he had embarked on a disastrous trip to Europe for his health. While there he contracted the rheumatic fever that essentially broke him. After several months in bed, the man who was before pale and wan, described himself as "much bent forward and the head a good deal down on the chest and immovable sideways or nearly so. I drag one foot in walking partly from the knee and partly from general weakness." Over the course of several weeks of his return by stages to England he struggled not to be 'repulsive' to his comrades, 'not that I see half of them, though I pull my hat off as a mark of respect to the master or mistress of the house of whom I see at first only the skirts or gaiters'.[64] It was an agonizing journey.

Ellis never recovered. The final ten years of his life were a slow and painful dissolution from a disease that bears many of the remarks of amyotrophic lateral sclerosis, the disease that afflicted Lou Gehrig and Steven Hawking. Ellis maintained a somewhat morbid sense of humour through his remorseless decline—'Today the dog died. I find that neither flowers nor the thought of them withering cheers me'[65]—and wrote poetry that his sister circulated among her friends. It is difficult to find inspiration in verses like:

> The flower was cankred [*sic*] in the bud
> It was a sickly faded flower
> What recks it now? however fair
> It still had died before this hour.[66]

As he reprinted this piece, Goodwin scrambled to assure his readers that as Ellis's sickness progressed 'his mind gradually found more settled peace and rested more surely upon the love of God and the merits of the Saviour',[67] but this assurance hardly rings true. Goodwin was the Dean of Ely Cathedral at the time he wrote these words, but even he found it difficult to cast Ellis's experience in traditional Christian terms.[68]

It is a challenge to find the spiritual power that so inspired Ellis's contemporaries in his sometimes dreary diary, his self-absorbed correspondence, his stiff personal interactions or his insipid poetry, but something more blazes out when he was defending the unity of man and his maker against the claims of Laplacian probability theory. Impending death beat a numbing refrain through the final years of Ellis's life, but he was focused on the present when he wrote: 'Only on the horizon of our mental prospect earth and sky, the fact and the idea, are seen to meet, though in

[64] Robert Leslie Ellis to William Whewell, [April or May] 1850, TCL, Add.Ms.c.67/8.

[65] Robert Leslie Ellis to [William Whewell?], [undated], TCL, Add.Ms.c.67/57.

[66] Letter from Robert Leslie Ellis, 12 January 1848, TCL, Add.Ms.c.67/9. Reprinted in Goodwin, "Biographical memoir," xxxiii.

[67] Goodwin, "Biographical memoir," xxxiv.

[68] See the 'General Introduction' and Gibbins's chapter in the present volume for a comparative account of Ellis's obituarists.

reality the atmosphere is everywhere present. Everywhere it surrounds and interpenetrates the [black earth] on which we stand—making it put forth and sustain all the numberless forms of organization and of life'.[69] Eight years of living in a body broken beyond all repair, had enabled him to realize that the transcendent truths that could seem to lie so far away—'on the horizon of our mental prospect'—were in fact all around in the atmosphere that was 'everywhere present'.[70] Ellis breathed this truth in his darkened room, it blew around the wheelchair when he ventured forth into his garden, it everywhere penetrated the black earth on which he lived although he could no longer stand.

There is no reason to believe that Sophia De Morgan read Ellis's musings about the immediacy of transcendent truth. She was a remarkably well educated Englishwoman, whose father, the religious radical William Frend, was a pioneer in the effort to defend meaningful mathematics against continental forces of intellectual alienation. Frend taught his daughter a great deal of mathematics, but the subject never really caught her interest. She knew that mathematics served as a portal into the world of transcendent truth, but she preferred approaching that world through the words of the Bible and other sacred texts.

From this perspective, Sophia's determination to attribute "a perfect moral character" to Ellis may seem to have been grounded simply in his having experienced an illness as bad as that of Job, but there was more to it than that. Like most Victorian women, she lived in a world that was permeated by the experience of sickness and death. At the time, she was first struck by the frail young man one of her younger sisters had just died and she was beginning to contemplate life after death. Her desire to access the transcendent world of the afterlife only increased after the death of her father in 1844, and in 1853 exploded into desperation with the sudden death of her and Augustus's sixteen-year-old daughter. In the painful years that followed, Sophia desperately sought ways to maintain contact. After 10 years of determined searching she published her findings in *From Matter to Spirit: The results of ten years experience in spirit manifestations intended as a guide to enquirers.* Sophia's husband was not completely comfortable with her conclusions, but in a detailed introduction he fully supported her effort. Although the subject matter was not one he would ever enter directly, De Morgan recognized her work as a legitimate contribution to an ongoing conversation about the nature of transcendent truth.

Ellis had been dead for four years (1859) by the time Sophia's book was published. Peacock had died the year before. Whewell and De Morgan continued to defend the transcendent view of human understanding, but their insistence on pursuing a mathematics of transcendent truth was becoming ever more outmoded. By 1865, De Morgan was admitting that few still adhered to Peacock's approach in which insight and history grounded mathematical truth, though, he proclaimed, 'I have entire faith in the future'.[71] Whewell died in 1866, De Morgan in 1871. These

[69] Ellis, "Remarks," 606.

[70] Ellis, "Remarks," 606.

[71] Augustus De Morgan to John Stuart Mill, 5 February 1865, in Sophia Elizabeth De Morgan, *Memoir*, 329.

deaths signalled the passing of a generation, and a fundamental shift in the English understandings of the nature of mathematics. Sophia was well-aware of the ways that perceptions of the nature of transcendent truth were changing in the world around her, and a defence of the legitimacy of her husband's work lay at the heart of her *Memoir of Augustus De Morgan.* When she attributed "an almost perfect moral character" to the sickly young man, whose mathematical gifts so impressed everyone, she was recognizing another defender of the faith in transcendent reality. Twenty years after Ellis's death, Sophia hailed him as someone who was on her and her husband's side in a battle for England's soul that centered on the nature of mathematics.

Part II
Manuscripts

Chapter 8
Ellis's Papers in Trinity College, Cambridge

Jonathan Smith

8.1 Introduction

The second half of this volume consists of transcriptions selected for the most part from those papers of Robert Leslie Ellis that are preserved in Trinity College Library in Cambridge. These papers do not form a discrete archive, rather they comprise a survival, or more accurately several separate survivals, among the papers of the great mid-century Master of the College, William Whewell. Whewell had married Ellis's sister Everina Frances, widow of Sir Gilbert Affleck, in 1858. It is surely through this close family connection that the papers of the two brothers-in-law became so entwined. The importance of Whewell's own papers may have played a hand in long-term preservation of Ellis's literary remains, whilst Whewell's position as Master of Trinity made the College's Wren Library a safe repository for the large archive he left on his death, including the Ellis material he had inherited from his second wife.

8.2 Provenance and Archival History

While the amalgamation of the Ellis material with the Whewell papers may well have contributed to its preservation, it also had the unforeseen consequence of hiding its existence and obscuring its content. This was presumably not the intention of Lady Affleck, who acted as guardian and promoter of her brother's memory. An

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L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0_8

early glimpse of her as keeper of the flame can be seen in the letter dedicated to her published in William Walton's edition of Ellis' *Mathematical and Other Writing,* in which the editor thanks her for her assistance in lending him unpublished material for inclusion in the volume, speaking of

> All the manuscripts entrusted to me by you, classical, philological, botanical and mathematical, works of a more elaborate nature, I have not hesitated to include in this volume from a conviction that they will be of interest to many readers and from an impression, grounded on internal evidence, that the probability of their publication may have been contemplated by the author.[1]

Though after Ellis's death Lady Affleck was in possession of much of his surviving writings, they did not all pass to her at the same time or by the same means. The first class of her brother's manuscripts was hers during her lifetime, comprising the 200 or so letters from Ellis she gradually accumulated week after week as their correspondence grew. The second was made up of the materials that she inherited on his death, the papers and academic notes alluded to by Walton and the series of diaries kept by her brother in his youth and early manhood. Ellis's friend and neighbour John Grote may have had a hand in their transmission, as a note survives in which Walton talks of items that Grote had given him for possible inclusion in his volume of Ellis's papers, which appears to refer to some of the material that is now in the Wren.[2] The nineteenth-century custom of returning the letters of a deceased individual to their next of kin ensured that a third class, consisting of a number of letters sent by Ellis to his friends, also came into Lady Affleck's hands after he died. There is a fourth, smaller class of Ellis document in Whewell's papers. Like so many in that era, Whewell's first wife Cordelia assembled a collection of autographs which are preserved among her husband's papers. Ellis too is represented here. Though all four classes of document originate from the hand of Ellis, provenance in each case is subtly different.

Lady Affleck predeceased Whewell by just a year and her papers presumably remained in Trinity Lodge until the Master's passing. Hence it is not surprising that when Whewell's papers were removed to the Library not only were his wife's papers transferred with them, but those family papers that she had accumulated during her lifetime, including the papers of Ellis and also those of his father, Francis Ellis, and his great-uncle Henry Ellis, who had been Governor of Georgia and Nova Scotia. Such was Whewell's importance at the time that immediate plans were made to make something of the literary remains. After a few abortive attempts to find an editor, the task fell to Isaac Todhunter, who undertook to produce a two-volume memoir consisting of a volume of biography and another of selections from his correspondence. As part of the process of compiling these volumes, Todhunter made a brief catalogue of the Whewell papers. His conscientious approach to the task gives us some idea of the way in which the papers were preserved in Trinity, as

[1] William Walton, "Dedicatory letter," in William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co., 1863), v–vi, on p. v.

[2] See TCL, Add.Ms.a.221/7.

his catalogue describes how he found them in a number of large containers described variously as 'Tin Box' (presumably a proprietary deed box), two 'Tea Chests', one containing correspondence arranged alphabetically by correspondent, a 'Wooden Box' etc. However, beyond extremely brief descriptions of the content of each box, the catalogue soon becomes a chronological list of letters from correspondents and, while recording a few letters Whewell received from Ellis, gives no indication of the presence of Ellis's own papers amongst the larger mass of the Whewell archive. Though of course it was the Master and not Ellis in whom Todhunter's interest lay.

The catalogues that were made of the Whewell papers in the twentieth century allow the gradual emergence of Ellis's papers from the greater mass around them, though details are few. A mid-century index draws our attention to a box in Class R of the Wren Library (a class containing anything from Newton letters to Pali manuscripts) which contained, *inter alia*, personal correspondence of Lady Affleck, correspondence of various members of the Ellis family and poems and translations by Ellis himself. In 1961 the historian of science Walter F. Cannon visited the library and left behind a list – the results of what he described as a cursory inspection – essentially of the previously uncatalogued Whewell material [O.15.50]. Here in 'Box B' we find Ellis's letters to his sister, various notebooks by him, including one on Chinese characters, poetry and translations by Ellis and some elementary exercises on probability. Though admittedly brief, this was the most detailed description of the Ellis material produced in the century after his death.

At some time after Cannon's visit, and perhaps as a result of it, much of the Whewell papers and the Ellis material amongst them were decanted from the tin boxes and wooden trunks into archival boxes, and introduced to the various additional manuscript series which are still home to much of the library's archival resources. Reflecting the different caches of Ellis papers that I have alluded to, the Ellis material is not confined to a discrete section within these series, but it is divided into three separate groups of papers. Three boxes with the references Add.ms.a.79, 81 and 82 contain mostly letters to his sister and juvenile diaries; Add.ms.c.67 contains amongst other items Ellis's letters to Whewell, William Walton and Duncan F. Gregory, and Add.mss.a.218–222 contain for the most part the notebooks and diaries from Ellis's undergraduate days and later. This arrangement of the material persists today though for the sake of description here, I have divided the material into three classes: diaries, correspondence and notebooks with loose notes.

8.3 The Diaries

As we have seen, for large periods of his life Ellis was a conscientious diarist, especially in his youth and early adulthood. The surviving series begins in 1827 and peters out in 1845. There are gaps, often explained in the diaries themselves, thus he reports a 'scarcely-interrupted interval of 14 months' between his last journal entry of 1834 and New Year's Day 1836, indicating that the lacuna we perceive was of Ellis's own making and not the result of later calamity, while in 1838 he explains

that some pages were lost in error to firelighting: 'Days departed have ended up in smoke' is his poetic comment. Despite such losses the survival of the diaries is far from sporadic, with series of consecutive volumes giving us an unbroken record of large portions of Ellis's life. Occasionally, diary pages left blank have been used for entries of a later date, so for example, Ellis returned to the diary originally used for 10–25 September 1827 to record his life in the period 23–30 April 1829.

Even the earliest journals provide a record of daily events and of reading which, as he grows older becomes gradually more sophisticated. Forty-one soft-backed juvenile journals form a sequence beginning on 27 May 1827, when Ellis was only 9, and run until 1834. Though initially quite simply constructed, these youthful writings not only give us a sense of how disciplined a boy he was, but also offer insight into the curriculum of a privately-educated individual.[3] They give evidence of the development of his critical faculties and an increasing interest in current affairs as he ages, though this was not always apparent to Ellis who wrote in 1832:

> I have been looking over some journals which I wrote between two and three years ago. They are more like than I had thought to those that I write now. Yet surely I have grown older since then. (28 January 1832)

Notwithstanding this comment, the diary format does allow him to record more autobiographical information and – like teenage diaries everywhere – offer more opportunities for this type of introspection. One notable example of this is the short diary from August 1835 written at a time when Ellis was not regularly keeping his diary, where he clearly felt the need to commit his inner thoughts to paper. It is this volume that he obliquely refers to in his comment above.

Ellis next picked up his pen to diarise on 1 January 1836 at a time that is clearly important to his academic development. Though he continues for only two volumes before breaking off again on 27th May of that year, there is much here relating to his studies in the months before coming up to Cambridge in the following Michaelmas Term. He is clearly growing in confidence, as at one point we can see he is not only reading Aeschylus' *The Suppliants*, but daring to disagree with his tutor on how to construe a passage in it. His reading of both Mathematics and Classics with his private tutors seems rather impressive, even by the standards of the age, and he takes time to make general criticisms as well as document his reading – 'it is amazing how little there is in [Seneca], only words', while *The Bacchae* is 'a difficult' and an 'odd, unpleasant play' (29 February 1836).

Unfortunately, diaries for the undergraduate period survive only sporadically. His first terms are not recorded and, when the diaries begin again in November 1838, Ellis is soon apologising for not journalising more regularly. This is also the period when some diaries were given to the fire. However much we may regret this lacuna, the extant diaries do tell us a great deal about Ellis's Cambridge life, and record the critical opinions of established Cambridge institutions of an intelligent

[3] See Stray's chapter in this volume for an example of their use in this respect.

young man. Like his earlier journals, his reading is well documented and his opinions of the authors made clear, though the shape of the Cambridge course has by this time steered him more towards mathematics. His tutors, lecturers and coaches appear regularly, Peacock, Challis, Hopkins and Blakesley amongst them, as do numerous friends including William Walton, Richard Pike Mate, Duncan Farquharson Gregory and Alexander Chisholm Gooden. Ellis's lack of self-confidence looms large at times, especially as the trial of the tripos closes in and though he hates the 'wrangler-making process', ranking pervades the diaries. Diffidence aside, at one point he records Hopkins' belief that he would be Senior Wrangler. In short, they cover the subjects we would expect from a reading man of the period – compare for example the letters of his friend and contemporary Gooden – but such detailed sources are not so common that we should disregard the diaries as an important general source for the history of mid-nineteenth-century Cambridge, as well as a useful autobiographical one.[4]

8.4 Correspondence

For reasons relating to their provenance outlined above, much of the Ellis correspondence preserved in Trinity consists of outgoing mail as opposed to those letters that he received. Indeed, for a man who was very much at the centre of intellectual life in Cambridge and who for the latter part of his life relied on correspondence to maintain his academic interests, the count of incoming letters is extremely disappointing. James Spedding tops the poll with 3 letters sent to Ellis between 1848 and 1856. In contrast to this, out letters, particularly those to his sister, are voluminous.

There are just under 200 letters to Lady Affleck, more than half of which are undated – those that Ellis chose to date running from 1840 to the last year of his life. Most are in Ellis's own hand, but some are the product of dictation, which was clearly his preferred method when his illness was at its worse. The letters are for the most part more mature productions than the diaries and the nature of their narrative differs, being very much the letters of a brother to a sister they contain a good deal that is autobiographical. They thus form an excellent adjunct to the diaries. In addition to giving us parallel insights, they fill the void for nearly two decades of his adult life when such records do not survive. In them we find him diffident as he decides against trying for membership of the Athenaeum for fear of rejection, raging, as he storms at his nurse for causing him pain in the night, answering questions on mathematical teaching in Cambridge for the 1851 Commission and stranded at San Remo in 1849 by the attack of rheumatic fever that changed his life forever.

[4] See Jonathan Smith and Christopher Stray, *Cambridge in the 1830s: The Letters of Alexander Chisholm Gooden, 1831-41* (Woodbridge: Boydell, 2003).

Correspondence with Ellis's intellectual contacts is also far better represented by outgoing letters than those which Ellis received. There are nearly 80 to William Walton, about 20 to Whewell and three to Duncan Gregory. The letters to Walton in particular document a long friendship and shared interest in areas of mathematics, though the shadow of Ellis's illness is ever-present after San Remo. Numerous mathematical problems are described in them and subjects also reflect Ellis's published works from probability to bees' cells. Hydrostatics and the forms of ellipses, subjects which feature prominently in Walton's publications, are also subjects strongly represented and show Ellis in the role of critic and advisor. Indeed, while we know that his friends were keen to stimulate his mental faculties while he lay sick by sending him mathematical problems that they thought particularly interesting, there is also evidence in his correspondence that they sought out his advice on material they wished to publish. One surviving example of his interactions with other mathematicians can be seen in two letters of the mid-1850s from Augustus De Morgan on the four-colour problem and angles in spherical triangles. It is hard to read these without realising they are the vestige of a longer, possibly much longer, correspondence. One which for the most part appears to have been lost.

Given the nature of correspondence it is unsurprising that some letters from Ellis can be found in the archives of correspondents whose papers are held elsewhere than Trinity. There is a large cache of letters to Ellis's erstwhile political patron William Napier in the Bodleian Library.[5] Thirty letters from Ellis to Lord Kelvin are held by Cambridge University Library;[6] letters to James Forbes are deposited in the library of St Andrews University;[7] and those to C.B. Marlay are in Nottingham University Library.[8] This is surely not a comprehensive list.

8.5 Notebooks and Miscellaneous Notes

The third section of Ellis material, which I have called notebooks and miscellaneous notes, is something of a mixed bag, grouping together various items created for different purposes which nuance their content. There is much here that is not original, including notes of university lectures, some that is juvenile such as school exercise books, but also the occasional piece of original work.

Four exercise books that appear to date from Ellis's schooldays contain translations into Latin and Greek. More numerous are course notes from his time as an undergraduate. Two volumes of notes on Herodotus' Histories and Tacitus date from his year as a freshman, reflecting first-year college instruction where both were the subject of a course of lectures and examination. The content consists of

[5] University of Oxford, Bodleian Library, MS.Eng.lett.c.245.

[6] CUL, Add.7342, Add.7656.

[7] University of St Andrews, Special Collections, msdep7.

[8] University of Nottingham, Manuscripts and Special Collections, My.

short contextual and philological comments, suggesting that the class worked through the set books line-by-line with the lecturer. The individual lectures are numbered and, given Ellis's diligence, probably give a good representation of the ideas that the lecturer was trying to impart to his pupils. The notebooks on Dugald Stewart's *Outlines of Moral Philosophy* and Paley's *Natural Theology* most probably date from his second year for similar reasons to those on the classical historians. While these volumes give us a glimpse into the lecture room and partially record the process of the Trinity undergraduate – and an excellent one at that – much of the intellectual content is the work of others.

Mathematical notebooks, with a preponderance of material on calculus, also survive, mostly presumably from his second and third years when the Cambridge course took a decidedly mathematical turn. The notes are arranged by topic: half a volume is dedicated to optics while a number of proofs on probability are grouped together. Headings such as 'Herschel's Theorem', 'Jupiter's Satellites', 'Perturbation in Longitude' and 'Cavendish's Problem' help the reader navigate the contents. Many volumes have texts beginning both at front and back, a common student practice saving both paper and pence, but one which may fox the unwary reader. Additionally there are also mathematical notebooks from his post student days. A volume of problems prepared either for College or University examinations survives, probably dating from the mid-1840s when Ellis was Moderator in 1844 and Examiner in 1845, though he may, of course, have been preparing them for the use of one of his mathematical colleagues. Occasionally the mathematical notebooks give up some original mathematical work by Ellis which he signs 'RLE' to distinguish it from the surrounding material.

A number of notebooks survive from Ellis's years as a young Fellow of Trinity. An English translation of the Institutes of Gaius begun in January 1845, towards the end of James Geldart's long tenure of the Regius Chair of Civil Law for which Ellis had aspirations, fills several volumes. The first published translation of this work into English dates from 1854, so it may be Ellis's original work. Whewell certainly consulted him on the subject of Roman Law for the second edition of *The Elements of Morality, Including Polity*.[9] More interesting, perhaps, is an account of the conduct of the examination for the Mathematical Tripos when Ellis was one of the examiners.[10] The remainder of the notebooks concern subjects less closely related to the Cambridge curriculum, but of interest to Ellis. Unsurprisingly, three volumes of notes on Bacon survive, the volume from 1836 confirming his early interest in his work.[11] Further subjects to which Ellis dedicated notebooks include French history from the reign of Louis XIV to the fall of Napoleon, ancient Greek metrology, comparative philology, card games and Chinese characters. In addition to the notebooks, a small bundle of loose notes, mostly single sheets or bifolia, survives. It is so

[9] William Whewell, *The Elements of Morality, Including Polity*. Second Edition (London: John W. Parker, 1848).

[10] See Ellis's diary notes on the Tripos examination of 1845 (TCL, Add.Ms.221/16) in the present volume ('Selected Diaries').

[11] See the chapter by Verburgt in this volume

miscellaneous that it is surely not a natural grouping, but among the various jottings and maps illustrating historical scenarios are a note on the four-colour problem, produced presumably in relation to the correspondence with De Morgan on the subject; an 'Illustration of 'the law of international value"; and a substantial list of errors in the 5th edition of Whewell's *Mechanics.*

8.6 Concluding Remarks

Though for much of the period after his death the Ellis papers languished in a barely-accessible state, it is difficult to make the case that this adversely reflected his reputation. The analytical history of science based on archival resources essentially did not exist as a recognisable discipline until the latter part of the twentieth century. True, Whewell himself had two Victorian biographers, Todhunter and Mrs Stair Douglas, but though they published copious amounts of archival material in their work, they did not commit to it too much academic scrutiny. Secondly, Ellis's published works, especially on the subject of probability, were indeed well known and used by subsequent writers decades after his death: John Venn (1866), Maynard Keynes (1921) and Georg Henrik von Wright (1941) all knew his work on probability and inductive logic and accorded it the highest praise.[12] The fact that Cannon had to construct his own catalogue of a large portion of the Whewell papers when he visited Trinity in the early 1960s is indicative of the changing needs of the scholar driven by changes in scholarly method and the tendency of libraries to be a step behind. The developing interest in the history and philosophy of science and mathematics, their teaching and practice and the networks involved in the dissemination of ideas have shown the value of the papers of individuals such as Ellis.

For the student of pedagogy in the mid-nineteenth century there is much useful material in the Ellis papers, as Christopher Stray's chapter ably demonstrates. While it must be remembered that he was an exceptional pupil, notes of his reading and descriptions of his interaction with his tutors document an example of private education of the period. And although his early years at Trinity are not covered by his surviving diaries, his lecture notes give us evidence of the content and nature of the Cambridge curriculum as viewed by Trinity tutors. When he returns to keeping a diary, his life as a contender for the Senior Wranglership and early life as a Cambridge BA is documented. Taken with other contemporary and near-contemporary sources such as the letters of Alexander Chisholm Gooden and

[12] See John Venn, *The Logic of Chance: An Essay on the Foundations and Province of the Theory of Probability, with especial Reference to its Application to Moral and Social Science* (London: Macmillan, 1866); John Maynard Keynes. *A Treatise on Probability* (London: Macmillan, 1921); Georg Henrik von Wright, *The Logical Problem of Induction* (Helsinki: Finnish Literary Society, 1941).

Bristed's *Five Years in an English University*, they consolidate our insight into Cambridge and Trinity of the time.[13]

One thing remains to be said. In section 8.2 above I quoted Walton reporting the fact that he unhesitatingly included material loaned to him by Lady Affleck in his volume of collected papers by Ellis. There appear to be seven papers in the volume that had not been previously printed. However, finished manuscripts of none of these pieces survive amongst the papers in Trinity College Library. Lady Affleck died two years after the publication of this volume, but perhaps there was such a delay in returning the manuscripts to her that she died before this could happen. Whatever the cause, it does suggest that there may be further Ellis manuscripts waiting to be rediscovered.

[13] See, respectively, Smith and Stray, *Gooden*; Christopher Stray, *An American in Victorian Cambridge: Charles Astor Bristed's* "Five Years in an English University" (Exeter: Exeter University Press, 2008).

Diaries

Note to the Reader

Lukas M. Verburgt & Christopher Stray

Of Ellis's diaries, some fifty have survived, beginning in 1827, when he was a nine-year-old boy, and ending in 1845, when he acted as Examiner in the Cambridge Mathematical Tripos. When published *in toto*, the diaries would make up a volume of some 300,000 words, or roughly 700 pages of print text. The following chronological, annotated selection – the result of a collaboration between Lukas Verburgt and Christopher Stray – only provides a snapshot of the wealth of available archival materials, the full details of which can be found in Appendix 3 at the end of the book.

The first diary (TCL, Add.Ms.a.82/3) has been selected because it marks the start of Ellis's diary-keeping; the second (TCL, Add.Ms.a.82/43) because it is exemplary of the his pre-Cambridge diaries, studying at home in Bath with two private tutors; the third and longest diary (TCL, Add.Ms.a.82/1) because it is a unique document of Cambridge student life in the late-1830s; the fourth (TCL, Add.Ms.a.218/41) since it offers an insight into Elis's life as a young Fellow of Trinity College ; and the fifth, one-page diary (TCL, Add.Ms.a.221/16) because it provides a unique, first-person account of the examination process of the Mathematical Tripos at Cambridge in 1845, the year in which William Thomson (later Lord Kelvin) graduated Second Wrangler.

All editorial insertions in the diaries appear between square brackets. These insertions mostly concern (conjectural reconstructions of) words which are missing, illegible or mutilated and English translations of phrases recorded in foreign languages (mainly Greek, Latin and French). Where a conjecture is uncertain, it is followed by a question mark enclosed within the brackets. Those words or passages which are not conjecturable are indicated by the editorial insertion of an

L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0

italicized explanatory phrase, such as [*illegible*] or [*page missing*]. All Greek words have been transliterated, using *o* for omicron and *w* for omega.

All annotations appear as footnotes, which have been confined to identifying persons, events and publications mentioned or alluded to as well as sources cited from. Annotation is provided at the first mention of a person, event, publication or source; additional details are given when relevant. For persons, the annotation at first mention is limited to basic biographical information. The majority of the historical characters referred to are graduates of the University of Cambridge and, in many cases, of the Mathematical Tripos. Since it is often useful to inform the reader of a character's university career – year of entrance, position in the order of merit ('W' standing for 'Wrangler', 'SO' for Senior Optime, 'JO' for Junior Optime, and the attached number indicating place in the list, e.g. '4W' (Fourth Wrangler), '2SO' (Second Senior Optime) and '4JO' (Fourth Junior Optime'), year of graduation and year of election to a Fellowship – this information will be provided in abbreviated form after the first mention of the character's name. Thus, Robert Leslie Ellis (1817–1859), Trinity 1834; B.A. 1840 (SW and First Smith's Prizeman); Fellow 1840, indicates that Ellis was admitted to Trinity College, Cambridge in 1834, that he graduated as Senior Wrangler in the Mathematical Tripos of 1840, that he won that year's First Smith's Prize, and that he was elected Fellow of his college in that same year. Additional relevant information – e.g. that Ellis served as an Examiner in the Mathematical Tripos of 1845 – is provided at subsequent mentions, depending on the context.

Selected Diaries

[27 May 1827–25 June 1827
TCL, Add.Ms.a.82/3]

[Small format, paper covers]

[Inside front cover:]
Journal of Robert Leslie Ellis, commenced 27 May 1827.

Why should my days sink to oblivion? & Fanny's be preserved?

The Cave: The Cave was a partition from the bedroom of mamma in which were papa's regulator & telescopes & great part of mamma's books; a delightful place, frequented for the sake of the books.

[RH page:]
Sunday 27 May [MS annotation in pencil: 10 years old E.F.A.]

Down at ½ past six. Read Cuvier's Theory of the Earth.[1] 7 to half past, played with Mary Jane. Half past to eight and a half. Said catechism & Crosman.[2] Read the 'Abridgment of the bible'.[3] 8 – ¾ past, played. ¼ to 9 to 9, Breakfast. 9 to ½ past, Conversation with Fanny, Penelope & Mini. 9 ½ to 10 Read Cowper. 10 to ¼ to 11, read Dictionary of facts of knowledge.[4] ¼ to 11 to 11 dressed. 11 to 1 Church. 1 to 2, read Dictionary of facts of knowledge. 2 to 4 ¼ In the cave. Whately.[5] In the cave 4 – 5 ½. Dinner. 5 to 6 read Whately & D[ictionary of facts of knowledge]. 6 to 7 ½ Heard papa read Whately.

Weather cloudy. Whole day pretty well spent.

[At foot, deleted text of description of the Cave, copied on opposite page]

Monday 28 May
Down at 5 minutes to 6. 6 to 7 ¼, prepared for Mr Johnstone. 7 ½ to 8 ½ read with Mademoiselle. 8 ¾ to 9 breakfasted. 9 ½ conversed with Mini. 9 ½ to 10 ½ Mr Johnston. 10 ½ to 11 ¾ Mr Davis. 11 ¾ to 12 ¾ in the garden. 12 ¾ to 1 dressed. 1 to 4 Walking with papa. 4 to ¼ past 4, read [Rev. William] Bingley's useful knowl-

[1] Georges Cuvier. *Discours sur la théorie de la terre* (Paris, 1812). Translated into English as *Essay on the Theory of the Earth* (Edinburgh, 1813), with several later editions.

[2] Henry Crossman. *[An] Introduction to the Knowledge of the Christian Religion. In Two parts. Part I. An Explanation of the Most Material Words and Things in the Church Catechism. Part II. An Explanation of the Two Covenants […] and some Religious Terms, etc*. (London, 1742). More than twenty editions followed, the last one appearing in 1861.

[3] Perhaps Caroline Maxwell. *The History of the Holy Bible; Being an Abridgment of the Old and New Testament* (London, 1827).

[4] Rev. S. Barrow [a pseudonym for Sir Richard Phillips]. *A Popular Dictionary of Facts and Knowledge* (London, 1827).

[5] Richard Whately. *Elements of Logic* (London, 1826).

edge, Vol 1. 4 ¼ to 5 Dinner. 5 to 5 ½ talked with papa, 5 ½ to 6 ½ Walked with papa. 6 ½ to 7 played. 7 ¼ Unwound part of a reel of thread for mama. Weather cloudy, occasional rain. Whole day well spent. NB I took a great deal of exercise today.

Tuesday 29 May
Down at 5 minutes to 6. 6 to 7 prepared for Mr J. 7[1/8] to 9 in the cave. 9 to 9 ¼ breakfast & conversation with Mini. 9 ½ to 10 ½ Lesson from Mr Johnston. 10 ½ to 11 ¼ with Mademoiselle. 11 ¼ to 11 ½ read the Harmonocon.[6] 11 ½ to 12 ¾ in the garden. 12 ¾ to 1 ¼ drawing with Fanny. 1 ¼ to 1 ½ dressed. 30 minutes past to 15 minutes of 2, played. 15 minutes of 2 to 2, read 'Continuation of early lessons'.[7] From [2] to 2 & a quarter I waited till Fanny &c were ready. 2.15 to 3.45 But until four & a quarter I read the Ph[ilosophical] J[ournal].[8] 4 ¼ Dined. 4 ½ to 5 ½ Out with papa. Weather fine day, pretty well spent.

Wendesday [sic] 30 May
Down at 10 to six. 6 to 7, prepared, and 15 m out. And 9.15 to 9.45, read the Edinburgh Journals of Science, 15m of 9.[9] To 9.15m breakfast. 9.15m to 9.30m conversation with Mini. 9.30m to 10.30m with Mr J.10.30 to 11.15 Translated from Latin. 11.15 to 11.45 With Mademoiselle. 15 to 12 to 15 to 1 In the garden. Until 1 I drew. 1 to 15 past 1 Dressed. 1.15 to 1.45 Played. 1 to 3 & 30m Made a model of a machine for finding the altitude of the sun by the shadow shown until four. I talked with papa. Then I dined. 5 ¼ to six in the cave. 6 to 7 & 15m Out. Weather generally fine but sometimes cloudy.

Thursday the 31 May
Down a[t] 20m to six. 20m of six to 7 prepared. 7 to 8 Read in the bookcase [sic] 8 to 9 played. 9 to 9.30 breakfast & played. 9.30 to 11 with Mr J & Made[moiselle]. 11 to 12 With Made. & in the garden. 12 to 1 in the garden. 1 to 2 dressed. In the garden until 3. 3 to 4.15m. In the cave. 4.15 to 6 Dinner & talked with papa. 6 to 8 Out. Weather showery until 2, fine afterwards. Day well spent.

Friday the 1 of June
Down at 25m to six. From that time to 6.30m prepared. 6.30m to 7.30m played. Until 8.15m read with Mademoiselle. Until 15m of 9 read with Fanny. Until 9 breakfast. Until 9.30m read King Coal's Levee.[10] Until 10.30 with Mr J. Until 11.15 translated. 11.15 to 12.15 in the garden. Until 1, dressed & played. P & I [until] 3.30 played & in the cave. 3.30 to 4 out. Then dinner. From 5 to 6, with papa. In the cave & mamma's room until 7.30. Day pretty well spent. Weather wet till 9, fine since.

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[6] *The Harmonicon, A Monthly Journal of Music*, 1823–33.

[7] Maria Edgeworth, *Continuation of Early Lessons*, 2 vols. (London, 1815), a sequel to her *Early Lessons* (London, 1801).

[8] Cf. diary entry for 17 June 1827.

[9] *Edinburgh Journal of Science*, 1825–.

[10] A poem by Charles Lamb, admired by Goethe.

Saturday the 2 of June
Down as 5m past 6. To 7 prepared. To 7.30 played. To 8.15 with Mademoiselle. To 15 of 9 played & drew. To 9.30 breakfast & conversation with Mini. 9.30 to 10.30 with Mr J. To 1 in the garden & in the cave. To 1.30 dressed. To 2 in the garden. Out until 4. 4.45 dinner. 5 to 6.30 in the garden. Out until 7. Until 7.30 read Conversations on Botany.[11] Weather rainy until 12, fine since. Whole day well spent.

Sunday the 3 of June
Down at 5 past six. To seven in the garden. To 8.15 out. To 9.15 said the Catechisms & Crosman. Read 'The Abridgement of the Bible'[12] & breakfasted. 9.15 to 10.15 Conversation with Mini. To 15 of 1 dressed. To 1 played & at church. Walked till two. In the carriage & to 5 1/4 dinner. To 15 of 6 played. To 6 in the cave. Out till 7.15. Weather fine, one shower at 11 o'clock. Day well spent.

Monday the 4 of June
Down at 5 past 5. Prepared till 7. In the garden 7 to 8.15. Out till 30m past 9. Read the 'Edinburgh Review' and breakfasted. Till 15 of 12 with Mr J. and Mr D to a quarter of 1. With Mademoiselle to 15 past 1. Played & drew till 30 past 1. Dressed. Played till 3.30. Till 15 past 4 in the garden & reading Dr Johnstone's Dictionary.[13] Then dinner & talked with papa till 6 o'clock. Out till 30m past 7.

Tuesday the 5 of June
Down at 15m past 6. 15 past 6 to 15 past 7 prepared. Till 15 past 8 with Mademoiselle. Till 15m of 9 cleaned 2 slates. Till 10.30 breakfasted played & took a lesson from Mr J. Till 11.30 talked with Fanny in the garden. Played in the garden & drew. Till 2 played 7 dressed. Till 15 of 3 played & in the garden. Till 4.30 in the carriage. Dinner & talked with papa until 15 to 7. Till 8 out with papa. I got several new ideas today.

Wendnesday [sic] the 6 of June
Down at 15 of 6, till 7 prepared. Till 9 looked for my scissors & played by myself at paper boats. Till 10.30 breakfasted & took a lesson from Mr J. Translated from Latin until 11.15. Till half past read 'Jeux de quatre saisons' to myself.[14] And afterwards with Mademoiselle until 12. Played with Frank in the garden till 3. Read 'Practical education' till 4.30.[15] Dinner, talked with papa till 5.30. Read Diary of an invalid till 6.[16] Played till 7. Read Diary of an invalid till 30 of 8.

Day well spent.

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[11] Sarah Fitton, *Conversations on Botany* (London, 1817), with several later editions.

[12] Possibly Caroline Maxwell, *The History of the Holy Bible; Being an Abridgement of the Old and New Testament* (London, 1827).

[13] *A Dictionary of the English Language*, sometimes referred to as *Johnson's Dictionary*, published in 1755, was the standard English dictionary until the completion of the *New* (later *Oxford*) *English Dictionary* (1884–1928).

[14] Adélaide Dufrénoy, *Les jeux des quatre saisons, ou les amusements du jeune âge* (Paris, 1812).

[15] Maria and Richard Edgeworth, *Practical Education* (London, 1780).

[16] Henry Matthews, *The Diary of an Invalid, the Journal of a Tour in Portugal, Italy, Switzerland and France* (London, 1815), with several later editions.

Thursday the 7 of June
Not being very well I was not down till 7. Prepared until 15m of 9. I was long about it for the same reason. I breakfasted till 9.30 played. Took a lesson from Mr J from that time to 11. Went two or three messages for mamma. Till 30m of 1 drew & played. Idem till 3. Till 4 in the garden. Till 6 dressed dined & talked with papa & mamma. In the cave till 15 past 7. Played, read Mrs Marcet's Political Economy till 15m of 8.[17] Weather pretty doubtfull. Fine in the evening. Day pretty well spent.

Friday 8 June
Down at 5m past 6. Prepared till 15m past 7. But played till 15m of 9. Till 30m past 10 prayed. Breakfast – with Mr J. Played & translated with Mademoiselle till 15m of 12. Played, & in the garden & dressed (played) in the garden till 15m past 4. Dinner till 5 15m. Amused myself till six. Out since weather fine. Day pretty well spent.

Saturday 9 of June
[Down] 10m past six. Prepared till 10m past 7. Out till 9.15m. In the garden till 9. Till 10.30 breakfasted & took a lesson from Mr J. Till 15m of 12 did a quadratic equation & with Mademoiselle. In the garden till 15m past 3. At 4 dressed & read Mrs Marcet's Political Economy till 16 & 17. Dinner & read Lexiphanes till 8 & 25m.[18] Day pretty well spent, weather fine.

Sunday 10th of June
Down at 6, eat my biscuit till 15m past 6. Out both in the garden & private walk till 15m past 8. Said the catechism & prayers & breakfast & played till 15m past 10. Dressed played & at church till 10 past 1. Till 30m past 4 played in the [garden *del*] cave. Dinner & conversation with papa till 30m past 6. Out till 8. Weather fine, but day pretty well spent.

Monday 11 June
Down at 5m past 6. Till 6 & 30m prepared, out. Breakfast. Soaked my hand in 1 part brandy 2 vinegar & 7 water & took a lesson from Messrs J & D. Till 4 read with Mademoiselle. In the garden, cave & garden & read 'Thompson on the Corn Laws'[19] & Marcet's 'Political Economy'. Dinner & in the cave till 6.30m. Out till 7.30. Weather fine & day well spent.

[Small ink drawing at foot]

[17] Jane Marcet, *Conversations on Political Economy* (London, 1816).

[18] Archibald Campbell, *Lexiphanes, a Dialogue: Imitated from Lucian, and suited to the present Times. Being an Attempt to restore the English Tongue to its ancient Purity, and to correct, as well as expose, the affected Style, hard Words, and absurd Phraseology of many late Writers, and particularly of Our English Lexiphanes, the Rambler* (London, 1767).

[19] Thomas Perronet Thompson, *Catechism on the Corn Laws* (London, 1827).

Tuesday 12th June
Down at 6. Till 15m past 7 prepared. Till 12 out breakfasted. With Mr J & Mademoiselle & in the garden. Till 4.15 dressed & Miss Acland was here & I was with her talking with her about histories of England & in the garden. Talked with Frank. Dinner & played with Frank & talked with papa. Looked at the setting up of papa's new clock. Till 6 [read the Journey of an invalid *del*] out in the carriage. Weather fine & day not very well spent.

Wendesday [sic] 13th June
Down at 7m of 6. Prepared till 5m past 7. Out till 15m past 8. In the garden till 15m of 9. Until 9 talked with papa concerning the corn laws. Till 15m past 9 breakfast. Till 30m past 9 played. Took a lesson from Mr J till 10 30m. Till 12 with Mademoiselle & translated from the Latin. In the garden & dressed till 1. In the garden & helped Mini cut off the dead leafs from her geraniums & played at boats in the garden & read the Journal of an invalid till 4 & 30m. Dinner & play till 6. Out till 15m till 8. With J[?] till 8. Weather fine, day well spent.

Thursday 14th June
Down at 7m past 5. I was the first of the house today. Prepared till 10 past 6. Out both in the garden & private walk till 15m [to 8?]. Read Journal of an Invalid. Breakfast & lessons from Messrs J & D. In the garden & cave & out with papa till 4. Dinner and read Personal sketches.[20] Till 15m [of 5] out. In the carriage till ¼ past six. Wrote memoirs of myself till 15m of 8. Weather rainy till 12. Whole day well spent.

I forget to say I was with Mad[emois]elle for half an hour.

Friday 15th June
Down at 10m past 5. Prepared & in the garden & wrote memoirs of myself till 7 & 15m. Out till 8. Till 15m of 9, read Journal of an Invalid. Breakfasted, talked with Mini. Took a lesson from Mr J[ohnstone]. Talked with Fanny. Translated from Latin. Drew with Fanny & read with Mademoiselle. In the cave. Dressed & in the cave & play & out in the carriage till 30m past 7. Day pretty well spent, weather cloudy.

Saturday 16 June
Down at 15m past 6. Prepared & played 7 botanised till 15m of 9. I took a lesson from Mr J. Read with Mademoiselle & in the garden till 15m of 1. Dressed in the cave & heard papa read Akenside until dinner.[21] Played. Till 6 [Read Journal of an Invalid *del*] Till 6 Out. Till 7 15m read Journal of an Invalid. Weather fine, cloudy in the morning.

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[20] Sir Jonah Barrington, *Personal Sketches of His Own Times*, 2 vols. (London, 1827).

[21] Mark Akenside (1721–70), poet.

Sunday 17th of June [doodles and word at top L]
Down at 15m past 5. Eat my biscuit while I played at spectres a rude kind of camera obscura & in the garden till 6 & 30m.[22] Played & out & said catechism & breakfasted & talked to Mini till 15m past 10.

Read Philosophical Journal.
Dressed & at church till 1 30m. In the carriage till 4. Then reader. I wrote what have you/you have now read. Dinner & played till ¼ past 6. Seven pm somewhat perverse, but being admonished by papa became good. Out till 8 & 30m. Day pretty well spent. Weather cloudy in the morning but fine since.

Monday 18th June
The 12th anniversary of the battle of Waterloo. Down at 30m past 5. Prepared for an hour. Today was Greek. Therefore I will only observe that I did derivations, which is merely noting & parsing. Then I corrected some ancient poetry of mine, which was not worth the trouble & wrote part of my Memoirs, & then we went out. I sketched a gate of a little field which is so comfortable that we call it Elysium. 30m of 9 till 15m of 9. I amused myself with taking out the tendons of plantain. Breakfast & took a lesson from Mr J in which we went as far as half the combat of the caestus.[23] I took a lesson from Mr D. I read with Mademoiselle & in the cave. Dressed & in the cave again. I then went out with papa & we saw the print of Joshua commanding the sun to stand still[24] & a few other prints at Duffield's. 7 Dinner during which I determined not to be so dry in my Journals. Play & out in the carriage. Till 30m past ?8 walked home with papa – as we walked we talked of Napoleon. Weather fine, day well spent. Saw a boat go down three steps from the old bridge.[25]

Tuesday 19th June
Down at 20m past 5. It was Latin, & I construed Cornelius Nepos – in the life of Eumenes, and translated a little from Latin & did a few other things.

We went to Weston. I picked some dog roses. I played until breakfast time. After I drew a house, till I received the information that Mr Johnston could not come today. Upon which I went to Mademoiselle As Mademoiselle was not ready just then, I determined to play until she was ready, but a letter coming from Henry to Mini, I listened as she read it aloud. I began 'Fetes des Enfans' today.[26] I don't like it much. I drew a little more. In the cave & dressed & in the cave. Saw some new potatoes. Dinner during which I saw new potatoes boiled. This day I eat strawberries for the

[22] See Fulgence Marion, *The Wonders of Optics* (NY: Scribner, 1871), 264–76. French original *L'Optique* (Paris, 1867).

[23] Boxing with weighted gloves. They were reading Virgil's *Aeneid* Book 5, in which Aeneas's men held games that included boxing matches.

[24] Joshua 10: 12–13. This was after Joshua 'fit the battle of Jericho'.

[25] Perhaps the Deep Lock on the Kennet and Avon Canal, the second deepest lock in the United Kingdom; the Old Bridge was replaced in 1965 by the Churchill Bridge.

[26] J. Ducray-Duminil, *Les fetes des enfants* (Paris, 1818).

second time this year (yesterday was the first time). Play. In the garden. Out. Talked about the eminent men of this & the last generation. Discovered where Mr J lives, just opposite the sphinx.[27] Weather fine, day pretty well spent.

Wendesday 20th July [sic]
Down at 15m past 5. I prepared not regularly but by writing a latin letter & writing some nonsense verses. Out. I sketched a house. Amused myself with plantain. I breakfasted & walked in the garden. When Mr Johnstone came I took a lesson. We did but little Xenephon [sic]. In the Cave. I read with Mademoiselle. In the Cave after dressing & in the garden till 4 & 15m. papa gave me 'Legendre'.[28] Dinner, played in the garden, where I [*illegible*]. Afterwards in the hall. Out in the carriage 30 past 7. Read a little Legendre. This day does not appear so well occupied as the two last but I was in the cave so long. Weather fine, one of the longest days in the year.

Thursday 21st June
Down at 20m past 5. Busied myself about my business – whether I should do Virgil or Greek. I decided for the former. This debate kept me so long that I had not done preparing till 30m past. I went in the garden until we went out. I shaded my house which I sketched the 19th. Breakfast & play till I sent to Mr J. We did Cornelius Nepos.[29] Wrote & did two quadratics. Read Monsieur Noelle[30] at half seven with Mademoiselle. In the cave & play & dress & play. Read Legendre – out in the garden till diner [sic], played at guiding the roller. We went out, to Shaw's coming back. I let my cane fall into the grate of Modger's & Bury shop it was got up safe. At Colling's library I was much amused by 'Dr Syntax's tour in search of a wife'.[31] Weather cold in the morning – during the latter part of Mr J lesson a hard shower of hail. Some rain in the afternoon. & drops of warm rain in the evening. Day well spent.

Friday 22d June
Down at half past 5. Wrote a Latin letter to Mr J concerning Bristol. Settled my drawer. Played in the garden. We went to Bristol where we arrived at the White Lion after 2 hours and ¼ hours journey at 10 o'clock. After breakfast went to Smith's, where amongst other purchases a pair of gloves was got for me. Rain coming on we stayed there – until 30m past 11. We then went to the Institution where we looked at the pictures till [time omitted] & we then up Park Street where we met

[27] Two sphinxes were incorporated in an entrance to the Royal Victoria Park c. 1830.

[28] Adrien-Marie Legendre (1752–1833), French mathematician whose work on elliptic integrals provided basic analytical tools for mathematical physics. Perhaps Ellis read Legendre's popular *Eléments de geométrie* (1794); first English translation in 1819 (John Farrar) and 1822 (Thomas Carlyle).

[29] Cornelius Nepos (c. 110–24 BC), Roman historian.

[30] Not identified.

[31] By William Combe, first edition 1821. This was the third of three tours.

papa & Frank whom we had left when they went to Redland. We returned to the inn & without anything more than observing the new road at Heynsham reached Bath. When we reached Bath, I played (after washing my hands) till dinner. After that played in the garden, & went out. I forgot to say that I liked 'The interior of a blacksmith's forge' the best.[32] Talked with papa, he lighted the fire in the back drawing room, it was very comfortable. Day pleasantly spent. Weather a couple of showers.

Saturday 23d June
Down at 7m past 5. I did Virgil. Played at boats by myself. Mini has given me a handsome boat named the Victory. It has a yellow piece of ribbon at the top of the mast. When we went out I sketched a house near the Bristol road. After walking I translated from Latin. Until breakfast I amused myself with taking the tendons out of plantain. One principal tendon measured 13' ¼. After breakfast I had only time to open Legendre than I was interrupted by the arrival of Mr Johnston. We did Vergil. Finished dove-shooting. I finished [Severin?] with Mademoiselle.[33] I played in the garden. After dressing I amused myself with the kaleidoscope until we went out. My hair was cut at Finigan's where I was much amused with the painting (on the plaster), no no (on the paper), of 'The French in Egypt'.[34]

[…] in the manner of Sichis [line inserted]

We returned without anything more worth noticing. I played until dinner after which I played in the garden until we went out. In the carriage on the London road. Day very pleasantly spent. Weather fine.

Sunday 24 June
Down at 1/3 past 5. Till 6 I made a paper mark & cutout, a pretty thing upon the linen. Afterwards I questioned Penelope on free calories?! Mama has given me some bonbons of which Mini & I eat some. We then went into the private walk – where I saw nothing remarkable. When we went home we did the church catechism & Crossman. After going out in the garden, I breakfasted. In the garden again & play & dressed. I have now begun my Journal 5 weeks. [?H-church] in the cave till dinner. Afterwards I played. When we went out we went through the private walk along the river side, up the Bristol road, along the lane that leads to Weston. Home by the Weston road. Day well spent, weather fine.

Monday 25 June
Down at 15m of 6. It was Greek I did Howard's exercises.[35] I drew a little of the house I began the other day. When I went out I sketched a house near Mr Collen's.

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[32] Not identified.

[33] Perhaps a French text about St. Severin.

[34] Perhaps *Battle of the Pyramids, July 21, 1798* (c. 1800) by the French painter François-André Vincent, which was done in black ink and graphite on washed paper.

[35] Nathaniel Howard, *Introductory Greek Exercises* (London, 1819).

Breakfast. I finished the games with Mr J. I did a couple of simple equations with Mr Davis. In the garden & cave until dinner. After dinner, played & forgot to say, I tried on my light trousers & dressed. We went out in the carriage on the London road. Weather fine, day not very well spent.

I find the occupation of keeping a journal delightfull [sic].

R.L.E. toujours pret

[**28 September 1834–15 November 1834**
TCL, Add.Ms.a.82/43]

[Some calculation of dates in pencil] 4 Dec to 19 Jan = 27 + 14 = 46

19 Jan to 5 March = 12 + 34 = 46 oh wonderful.

28 September
I think that my studies are over for the present, as I have little left to read. Did not go to any church, on account of a little cold or sore throat rather, which I got by accidentally sleeping with the window open. It reminds me of last December's feelings. Walked on the racecourse with Penelope. It is delightfully fresh.

29 September
Began Curve lines in Peacock's examples. Rode with Penelope & Mr Boss[36] – Old Bossy, as I familiarly speak of him. We went over the racecourse. Met Sir Ralph Gore.[37]

Went on the pier. Saw the Miss Gores & their cousins there. They asked me to tea tonight; I went – it was dull enough – there was some out of tune singing – which was delectable – A Mrs Boisseau or Boireau sang – she has a very sweet voice – & sings, as far as I can judge, correctly.

30 September
I had a letter from S. Barrow – There is very little in it – Mrs Lousada is in Bath for a short time. Her health has never recovered from the shock of the miscarriage last February.

Read Peacock's Examples[38] for nearly three hours. Walked in North St & on the pier – the last is the best thing here.

1 October 1834
Down very late with a slight cold, or more correctly inflammation of the tonsils. It is sometimes so painful, in the evenings, as to make the tears stream from my eyes – There was the band on the pier today – the music was indifferent. The last

[36] Ellis's Dover riding master.

[37] The 7th baronet (1758–1842). The baronetcy of Gore of Magherabegg, Donegal had been created in 1622.

[38] George Peacock, *A Collection of Examples of the Application of the Differential and Integral Calculus* (Cambridge, 1820).

piece I heard was the 'Chough & crow'.[39] I am exceedingly fond of this piece – the words are very pretty, & the associations extends to the music.

2 October
Read Peacock – that is did some examples. I am not ready in reductions, & want practice.

Mr Boss was faithless to his engagement – I went as far as East St in the carriage. Henry made his appearance at the coach office where we had stopped to inquire for Frank's luggage.[40] He has leave till the 15th. So ends my anxiety. I confess I never expected to see him again.

3 October
Read Peacock. These examples will necessarily be my only study till I go into Cambridgeshire.[41] Rode with Mr Boss & Penelope on the downs – Sauntered up North St and along the Western road.

4 October
Down late – after reading Peacock – Capt Michelet[42] expectedly called – he has been 'in voyage'. After riding I went to [see] him & we fenced for more than an hour.

Things do not seem straight with him, yet he keeps his spirits & seems as happy as ever. There is a great deal in temperament & in habit, more than in philosophy. Cicero argues wrongly that if time & habit can smooth down any sorrow philosophy can a fortiori anticipate the action of time.

5 October
Went to St Peter's – the new church, but could not get in, so I returned & went to St James's chapel. There was an exceedingly good sermon by Mr Kingston I think, 'neither circumcision availeth anything nor uncircumcision': 45 minutes.

I had intended to call on Mr Hayes who called yesterday but postponed it – & sauntered through the streets all the afternoon.

6 October
Read Peacock. The cycloidal class of curves, whose equation is $y^2 = x^n/(a - x)^n$ or still more generally $y^m = x^n / (a - x)^{n-m}$ has some curious properties.

At half past ten, went to Michelet's & fenced till twenty five minutes after eleven with little intermission. At twelve rode with Mr Boss.

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[39] 'The chough and crow to rest are gone / The owl sits in the tree', a chorus from Boieldieu's comic opera *La Dame Blanche*, first performed in England in 1826 as *The White Lady*. The opera was based on passages from five of Walter Scott's novels.

[40] Ellis's two (elder) brothers.

[41] To study with James Challis in Papworth St Everard. See 24 October 1834.

[42] A well-known local fencing master who had taught Ellis during the latter's holidays there since 1832; probably a French refugee.

The greater part of the afternoon I spent on the pier – the sea breeze is delightful in this hot weather. Shoals of spawn surrounded the pier head, while larger fish darted into the midst, & devoured whatever they could catch. A disgusting microcosm. In the evening went to the Gores. Miss Keane, granddaughter of the late Sir John was there – very handsome & a sweet voice.[43] Mr R. Gore, the younger cousin is amazingly ineffable – his down mustachios & his languishing looks are rather of the Don Juan style of affectation.

7 October
Investigated the singular points of the lemniscate & did a good deal towards finding the radius of curvature. The curve is exquisitely symmetrical, & I made use of this circumstance. After riding I went to Michelet's & fenced till near three. He speaks of Roland & Haslin as being the two first fencers in England.

I did not go out much again.

The evenings close in with great rapidity – it is not a good time of year to begin a new way of life. In the spring 'fresh hopes are born for other years',[44] but autumn reminds us too much of change & death to permit any thoughts for the future, but those which stretch in to eternity. I enjoyed the last spring intensely for me who care little for these things – and the glorious month of June with the moonlight saunters & meditations I shall not easily forget. It is gone & I am following.

8 October
Found the radius of curvature to Bernouilli's [sic] lemniscate.[45] The expression is complex.

Rode as usual & had an exceedingly good lesson from Capt Michelet. He showed me a new thing – coupe sur le point; it is difficult but very brilliant, when well done. On the pier. The band of the Royal dragoons played – out of tune sometimes.

The Gores came to us in the evening & stayed till half past eleven – Miss Elisabeth Gore is very but by no means offensively blue.[46] Of all things preserve me from the ology people male or female.[47] They are abominable, they are without my pale of salvation.

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[43] Sir John Keane, 1st Baronet (1757–1829), Irish Tory politician, Member of Parliament in the Parliament of Ireland for Bangor from 1790 to 1797, and later Member of Parliament for Youghal.

[44] Felicia Hemans, 'He never smiled again' (1827).

[45] A particular plane curve first described in 1694 by the Swiss mathematician Jacob Bernoulli (1654/5–1705). See Crilly's chapter in the present volume for a brief discussion.

[46] Bluestocking, a learned woman.

[47] 'Ologies of all kinds, from morning to night. If there is any Ology left […] that has not been worn to rags in this house […] I hope I shall never hear its name'. Charles Dickens, *Hard Times* (London, 1854), II, ix. 236.

I am not fond of any but the most abstract science, & even in mathematics I prefer those parts which have the least reference to any actual existence – the diff. calculus – the theory of equations & the rest.

9 October
Read a good deal of Greenlaw[48] on the subjunctive mood. This seems to me a very good book; the main principle is that when a clause is attached to the predicate of a proposition the subjunctive mood is used.

Rode on the racecourse. Mr Boss's horse was nearly done with him, he sprawled amazingly. Mr Boss sat very well – indeed it were odd if with all his practice he did not ride tolerably.

At Capt Michelet's. No one there – I waited an hour before he came & read amongst other things, Gray's elegy. The finest stanza I think is that beginning 'For who to dull forgetfulness a prey'.[49]

10 October
The tickling in my throat returned so I did not ride, & beside Greenlaw, I read but little.

I think the doctrine of the subjunctive mood is in the main sound, but is not so simple as at first sight it would appear because the logical subject is not so obvious a matter as the grammatical.

At Michelet's. The afternoon was heavy. Henry[50] left us today for Ireland.

11 October
Still idle. Indeed I have little left to do – & not much disposition to look for employment. Penelope rode with the Gores so I was not on duty. Mr R. Gore rode with them – he told me last week he hoped he shld never cross a horse again. So much for his consistency.

At the Groves in the evening. Miss Leah in bed – delirious I believe. Mr R. Gore had a headache & did not appear. Mr St George exceedingly dolorous. Altogether it was dismal.

12 October
Went to St James's. The sermon was very long, & very dull – & the preacher had a great brogue, & a voice like Mr Gore.

I am not in spirits, another black fit; surely there is a connection between the mind & the body, which conveys the impressions made on the one to the other. If I am trite in this remark I do not think myself mistaken. If the mind be an essence, sui generis,

[48] Richard Bathurst Greenlaw, *The True Doctrine of the Latin Subjunctive Mood* (London, 1833).

[49] Thomas Gray, 'Elegy written in a country churchyard' (1751).

[50] One of Ellis's elder brothers.

it is odd that it grows with the growth of the body – that it waxes & wanes as the physical energies & that finally a physical injury should suspend its functions. I say suspend because I refer to temporary accidents. There is more in all this than seems at first.

13 October
I was mathematical today, but not much, as I was obliged to ride at eleven. It is too soon after breakfast, although, at this season the pleasantest part of the day.

Fenced for an hour with Capt Michelet at his new house which is mainly intended as a salle d'armes. The room in which we were is a damp place & feels like a vault.

Talking of vaults, I wish I was superstitious – one loses excitement by not being so, & excitement sui generis, which nothing can supply.

14 October
Read Greenlaw on the subjunctive mood. It is a good book, but owing to the distinction made between the true & the grammatical subject, not so very simple in its principles as might at first sight appear. Nevertheless it is an improvement on the old systems. Went with Michelet to Capt Blunt's house 16 Brunswick Sq. & fenced with both there. Capt Blunt is a goodhumoured little man of eight & twenty.

15 October
Went to Capt Michelet's after breakfast but not finding him at home, did not fence. Read the first volume of Bulwer's 'Last days of Pompei'.[51] I can hardly judge yet of the felicity of the result. It is well written, but I think, not wholly free from violations of costume. For instance the Egyptian's name Arbaces is more Persian than Egyptian. Finished Greenlaw. Began Locke on the conduct of the under-standing.[52]

16 October
I saw nothing of Michelet today as it rained incessantly. In the evening however he came about a book, he had troubled me to leave. No 1 Devonshire Place which I had sent to No 1 New Steine. He swears now that wine is the only thing he cannot drink – it gets into his head he says after the first pint.

Finished the first volume of the 'Last days'. It wants individualization of character – the majority of personae dramatis are outlines. Perhaps this stile was intended to be adopted in order to prevent the attention being diverted from the catastrophe.

17 October
Fenced with Michelet today. I can never be a good fencer, but I know a good deal of the weapon & understand the theory of it pretty well. Michelet says that in fight-

[51] Edward Bulwer Lytton. *The Last Days of Pompeii* (Paris: Baudry's European Library, 1834).

[52] John Locke's *Of the Conduct of the Understanding*, published posthumously in 1706, originally intended as a final chapter for the fourth edition of *An Essay Concerning Human Understanding* (first edition 1689).

ing with the small sword it is best to keep at a considerable distance, engaged, but out of measure, & to let the other if he will begin. If you can, he says, take a time thrust, when your adversary advances, & beware of all the 'coups d'assaut' coupé sur point, remise feinte basse tour de l' épée' [friendly attack with the point, then a renewed attack, feinting low with the point, thrust and retreat] &c &c. It [sic] and wide on guard, the point rather low than high. All these things are useful to know in case small swords ever come into fashion again, & even if they do not, they may be on occasion useful.

Very unpleasant weather windy & harsh.

18 October
The weather continues bad, & I did not ride. Did not fence much to my own satisfaction.

Rather a curious property of numbers occurred to me – that the [*illegible*] sum of the digits of cubes is either 1, 8, or 9, & that in this order they recur. In other words the sum is always the same as that of the cube of the number less three, viz of 6^3 the same as of 3^3 of 27^3 the same as of 84^3. Because

$$\left(m+3\right)^3 = m^3 + 9m^2 + 27m + 27$$

$$= m^3 + 9\left(m^2 + 3m + 3\right)$$

Again let $m^3 = 10p + q$ &

$$9\left(m^2 + 3m + 3\right) = 10p' + q'$$

$(m + 3)^3 = 10(p + p') + q + q'$ or the sum of the digits = $p + p' + q' + q$

But $9(m^2 + 3m + 3)$ is a multiple of 9 & therefore the sum of the digits = (by a well known property) 9 & may therefore be cast out from $p + p' + q' + q$ which reduces to $p + q$, the same as in the case of m^3. The numbers 1 & 9 are the sums of the digits of 1 & 27. The property as far I see is peculiar to the cube. Take the thing generally let p be the number of terms before the series recurs

$$\left(m+3\right)^3 = m^3 + 3m^2 p + 3mp^2 + p^3$$

$$= m^2 + 3p\left(m^2 + mp + \frac{p^2}{3}\right)$$

The last term is to be a multiple of 9 ∴ [symbol is used up-side-down] $3p = 9$ & $\frac{p^2}{3}$ = integer.

$\therefore p = 3$ which filfills the other condition but in all other cases

$$(m+p)^n$$

$$= m^n + n\,m^{n-1}p + \frac{n,n-1}{1,2}m^{n-2}p^2 + \ldots p^n$$

$$= m^n + p(nm^{-1} + \frac{n,n-1}{1,2}m^{n-2}p^2 + \ldots p^{n-1}$$

& to make the second term a multiple of nine for all values of m p must be 9 – & the series will recur after 9 terms. I have dwelt ye longer on the property both for its neatness & because it may be of some use in determining that any given number is not a cube.

19 October
Today the wind was easterly, bitter & miserable. Went to St Mary's, a pretty church, with a transparency – the cross & a motto *tautw nika* [with this you shall be victorious][53]

The sermon was not good. Except to the post office, I did not go out. Mr & Mrs Wainwright called. Finished Pompei. There is great truth in Johnson's remark that whatever carries us back into past times, or forwards into futurity, elevates us in the scale of being.[54] Anything that even imperfectly does this is always to me at least a source of pleasure.

20 October
It struck me that an extension of the problem of the cubes might be devised by which it wld be extended to other powers, but as yet, I have made but little of it. My father went out for the first time since he has had a cold. We called on Michelet – his lodger is much worse; he is consumptive: 'il a trop vécu je pense' ['he has lived too long, I believe'].

21 October
Written at Brighton. ['At half past seven, after taking leave, which', scribbled through] Today – the last day – was spent in harrying to & fro; I was more disposed to repose. It is well when the necessity for exertion prevents thought. Called at Michelet's. He told me a curious story of old Barret. His sister was in England, & when he came here from France, he met her without knowing who she was & fell in love with her. After some time, there was explanation – 'Il m'a dit, que c'était un coup de foudre' ['He told me it was love at first sight'].

[53] The emperor Constantine defeated his brother-in-law Maxentius at the battle of the Milvian Bridge (28 October 312 CE). Constantine was a pagan monotheist, but during the battle saw a cross of light in the sky, and converted to Christianity.

[54] Samuel Johnson's comment on Iona, in his *Journey to the Western Islands*: 'Whatever withdraws us from the power of our senses; whatever makes the past, the distant, or the future predominate over the present, advances us in the dignity of thinking beings'.

Barrett was a natural son of Sir Peter Nugent. At whose house he met this girl – So Dr Crawford told me.

22 October
After taking leave, went off with my father in the Item[55] to London. We left Castle square at eight & were set down in Oxford Street at two. We saw nothing of the ruins. Mr Affleck called at nine & stayed till half past ten. We are at the New Hummums.[56]

23 October
We called at the Burlington Hotel Cork Street & saw Sir R. Affleck – a hale old man.[57]

Went to Cooks, to Dent's & to some other places. This is not much to say, but nevertheless we had six hours walking of it & left some things undone.

24 October
Left London in the Defiance[58] at eight & at about three arrived at our journey's end. The journey was pleasant enough as there were two very gentlemanly men in the inside & the day though cold was still cheerful. We stopped, & got out, & a fussy little man introduced himself as Mr Challis, & two to my eyes yahoos as his pupils.[59] However we walked all five about half a mile to his house, which is pleasantly situated, & I underwent an introduction to madame, & in an hour I was alone. There is some thing in the idea that is not calculated to raise one's spirits but I reflected that it is wise ay, & wisdom beyond all other to make the best of everything, & take the world as find it. We dined at five & began to brighten up. Crowfoot & Barrett[60] are the two beside myself, both gentlemanly & Mr C says talented. After dinner I went to Crowfoot's room; he was writing but said he was not busy & we sat some time; took tea at nine, & after prayers went to bed – at ten PM.

25 October
Breakfasted at half past eight. This is rather early, but the best of all maxims is to howl amongst wolves.

Mr Challis sat in my room some time talking on mathematical subjects. His plan is to begin at the beginning – not altogether a bad one. At two, we the pupils went out & walked to Hilton a pretty village about two miles off. At nine tea as usual.

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[55] A coach.

[56] A hotel in Russell Street in Bloomsbury; originally a steam bath (hummum) with lodgings.

[57] Sir Robert Affleck, whose son Sir Gilbert Affleck married Ellis's sister Everina Frances ('Fanny') on 1 December 1834.

[58] A coach.

[59] James Challis (1803–1882), Trinity 1821; B.A. 1825 (SW), Fellow 1826–1831, 1870–1882; rector of Papworth St. Everard, 1830-52. He forfeited his Fellowship on his marriage in 1831, but was Plumian Professor of Astronomy (1836–82) and re-elected fellow in 1870. See Barrow-Green's and Stray's chapters in Part I of the present volume.

[60] John Rustat Crowfoot (1817–1875), Trinity 1835, migrated to Caius 1835; B.A. 1839 (12W); Fellow, 1840–50. Barrett has not been found.

26 October
The service here is of course entirely by Mr Challis, & better though it might have been yet it was correctly & fairly done. He has no voice. The church is nearly the size of Charlcombe church. In this strange land a sojourner. I turn back to the familiar faces & familiar scenes of other days with more interest than I often feel. And yet how little place signifies. Existence is a very prosaic thing at best: the future is nothing, & will never be anything but a cold reality. In the past is all of poetry we have all we can have. In the past, as imaging past good dwells beauty, for all our associations must be of past time. And hence is perhaps one reason as well as that the anticipated decay of all beauty leads us to our own destiny, why beauty is always a mournful idea.

This is fanciful, & it may be unsound, but the sere leaves suggest such musings.

27 October
Read Sophocles Oedipus Coloneus with Mr Challis – Crowfoot & Barrett were also with him & we construed turn about, each taking a speech or a strophe. As for classes I might have staid at home.

Read Wood's Algebra[61] fractions with him afterwards alone; tolerably elementary. Played quoits in the afternoon. Read Euclid.

28 October
Read Tacitus today. There was nothing very remarkable in our reading. Afterwards I read Peacock by myself – but as he went to Cambridge with Mrs Challis did not read with Mr C. We set out to walk to St Ives, but after walking two miles I thought I could not do it without distress & walked quietly back. Sketched our church. We did not dine till six.[62]

29 October
Sophocles today. I wrote a translation, as did the others of a chorus in the Oedipus at Colonus, yesterday, & we gave it to him today.

Walked into Caxton a little more than three miles. I put a letter into the postoffice for Mr Davies.

30 October
Tacitus again. We are reading the Agricola. Did some fractions with Mr C. I should hardly have expected Boney or Bonny castle's arithmetic here.[63] It is not however wholly loss of time to go over the elements.

[61] James Wood's *The Elements of Algebra*, first published in 1795, and many later editions. A standard elementary textbook.

[62] The usual hour for college dinners in this period was 4pm.

[63] John Bonnycastle, *The Scholar's Guide to Arithmetic* (London, 1780), and many later editions. A popular elementary textbook. 'Boney' is apparently a joking reference to Napoleon.

Did not go beyond the Hut – & indeed the greater part of our time we stayed in the close: pealing &c.

31 October
Sophocles today. A man of talent will often make observations that the most profound bookworm could not make – & this seems the case here.

We read Peacock today. Nothing remarkable happened in the afternoon. In this place I feel lonely – yet I have not yet been in low spirits, which troubled me so much some months ago – nor have I brooded so much over what is imaginative – past – & future – as usual – 'Yet this avails not'.

If I could combine I should be better – but even this would not I am sure do. Verily 'in much study there is weariness of the flesh'.

1 November 1834
This is examination day – so when I went into the parlour, I found a paper for me, containing 20 propp. About half from Euclid & the remainder [sic]. To these written answers were required – & although I wrote on for the most part without let or hindrance, it took $3^{h}30'$ to finish them. Mr C. Cr. & B. went over to Cambridge. I walked into Caxton & about there.

2 November
This my second Sunday here passed much like the last, we went twice to church & heard one sermon – the evening was very heavy as we were in the drawing room for full four hours.

3 November
We had to go through the examination papers today, but beside this there was nothing unusual. I don't know why I am so little disposed to journalise here: it is a problem of some little difficulty. The days pass away without much to mark one from the other & it is now nearly a fortnight since I have written anything. Let it suffice then to say that I never felt the 'truditur dies die' ['one day presses up another'] so forcibly as I have done here.[64] Days & weeks pass on, without any enjoyment except that of health & tolerable spirits, that is freedom from dejection & except going to the wild Joddrels at Yelling on Thursday, cousins of L. Bulwer without any break.

15 November
I never loved you – I was the more deceived my lord – Hamlet.[65]

[64] Horace, *Odes* 2.18.

[65] An exchange in *Hamlet* Act Scene 3 Scene 1: Hamlet's statement and Ophelia's reply.

[**1 January 1839–26 July 1840**
TCL, Add.Ms.a.82/1]

Aphes mou to amartema [Take the sin away from me], 23 July 1840

1839

1 January
I have been negligent in journalizing of late since we left Bath. I have only recorded about four months, of which two were the Lent term of last year & the remainder from last October till now. And the greater part of them has perished as far as my chronicle is concerned, by being but to use in lighting fires. Days departed have ended in smoke, & the *pausiponoi douloi* [hardship-ending slaves] who put an end to suffering have first read & then destroyed my productions.

To guard against a recurrence of this misfortune, here is a book locked & bound – a gift, the giver of which I love mightily & not unreasonably.

I consider the loss of my journal & the neglect of it, a matter to be regretted; & I would fain have a record of the last four years instead of a fragment of eight months of them.

I have changed in this time, yet not more or otherwise than might have been foreseen.

Read Maddy's Astronomy.[66] Played Battledore & Shuttlecock with Affleck & Penelope.[67] Walked with my father to Kilburn by the fields & home by the road. A fine day – the roads very dirty. Backgammon with Fanny in the evening.

2 January
Up early. After reading my usual time walked with Affleck to Highgate & down the hill there & up it again. It is a long steep hill – reminded me of Bath. This was a very mild pleasant day. Read a little of Coleridge's letters & do not like them much.[68] His sentiment is too fine drawn, not to be sensual.

3 January
A letter from Joyce today.[69] Apparently one of his to me miscarried – which explains his seeming neglect. I wrote to him the 4th of November & have not heard till now. No news – Lady Arran is to be confined shortly. Joyce will be up near town. Went in to town to call on Jenkins[70] – out – which I was glad to find although I went in for nothing. Walked in the garden after returning. Thought of Lagrange's theorem not to much purpose.

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[66] W. Maddy, *Elements of the Theory of Plane Astronomy* (Cambridge, 1826). The copyright was bought by John Hymers, like Maddy a fellow of St John's, and later editions appeared under Hymers' name. For a discussion of this kind of procedure, see the exchanges in "Scientific morality at Cambridge," *Mechanics' Magazine* 46 (1847), 317–21, 352–7, 373–4

[67] Penelope Ellis (1814–56), his elder sister. Sir Gilbert Affleck had married Ellis's eldest sister Everina Frances ('Fanny') Ellis (1807–65) in 1834.

[68] *Letters, Conversations and Reflections of S.T. Coleridge* (London, 1836).

[69] Thomas Joyce, educated at Trinity, which he entered in 1836. Left Cambridge without graduating; later gave lectures on geology in Bath and London.

[70] Robert Jenkins, Trinity 1834; B.A. 1841. A close friend of Alexander Gooden.

In town I ordered a copy of B. Montague's selections to be bound: it is for Palmer, who has engaged to do my duty during the vacation.[71]

Backgammon as usual. Read a clever paper in an old New Monthly – 'Lost friendships'.[72] The transformations of a few years are pointedly told.

4 January
Wrote to Joyce. I had not much of any interest to say, but wished to assure him that I had taken no offence at any thing he had done.

Walked with my father on the Heath. Read a little of the last number of the Cambridge M[athematical] Journal. My eyes affected by the wind. Got by the fire light alone for an hour and more, evoking all old ideas–: 'non vanae redeat sanguis imagini' ['the blood may not return to the empty shade'].[73]

5 January
Read Astronomy. Walked down to the Edgware road on the heath with my father. I had two letters today, one from my [syn?], the other from Welsford about the auditale. Very hill-like affairs, both of them, but in reality harmless.

6 January
A stranger preached today, whose sermon I did not much like. It was snowing.

The day after this, I was taken ill, & found after some days I had the measles. In consequence of this, I did not return to Cambridge till yesterday the 8th Feb. Joyce, after I came down to the drawing room, called one day – stayed with us. He brought no news. He has written a pamphlet, political & coarsely done.[74] And so here I am again, with a little of that sickening feeling which comes over me from time to time, & which I can but ill describe, & with some degree of manners bitter dislike of Cambridge & of my own repugnance to the wrangler making process. There is but one place for me, & that I cannot obtain.

This however must & will pass away, if not before, when I leave this[75] & shake the dust off my shoes for a testimony against the system.

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[71] Basil Montagu. *Selections from the Works of Taylor, Hooker, Barrow, South, Latimer, Brown, Milton and Bacon* (London, 1805). Fielding Palmer, educated at Trinity College, Cambridge, which he entered in 1835, graduating 39th Wrangler in 1839. He was chaplain of Trinity, 1844–9.

[72] An article with this title has not been located, but there is a relevant discussion in the Countess of Blessington's "Journal of conversations with Lord Byron, II," *New Monthly Magazine* 35 (1832), 129–46.

[73] Horace, *Odes* 1.24.

[74] Joyce's pamphlet replied to *A Letter to the Queen on the State of the Monarchy, by a Friend of the People* (1838), written by Henry Brougham; cf. Jonathan Smith and Christopher Stray, eds. *Cambridge in the 1830s: The Letters of Alexander Chisholm Gooden, 1831–1841* (Woodbridge: The Boydell Press, 2003), 108–9. Several such replies were published, and there is insufficient evidence to identify one of them as Joyce's.

[75] Where one would expect 'this place' or 'this town', Ellis characteristically writes simply 'this'.

The other feeling I am not sure I would lose – if it depended on my will whether I should retain it. There is a dimness in my mind's eye, the memory of what I once loved begins to fade, & when I attempt to recall old feelings, there is something ghostlike about them. They do not speak to me until spoken to – they mutter something about what they once were, they disappear, & leave an indistinct consciousness of unreality.

I have often forgotten the scenes of my boyish days – but it is new to me to recall them so indistinctly. Still while the impressions of four years ago have the unreality they have also the sweetness of dreams. They are like dreams in this also; that a sense of change, of something gone & not to be returned, mingles in them all. Truly & beautifully was it said, that what has died within us, is often the saddest part of that time has taken away.[76]

8 February
Breakfasted at the Hoop.[77] I had been at morning chapel. Went with my father to the bank. He called on Peacock.[78] I did not. Joyce called. We spoke of a memorial to the master from the prizemen, to request some authentication of our books. He engaged to draw it up. Walked to Downing. Read Goldsmith's essays. Was marked in hall.[79] Dined with my father at the Hoop. He took tea at my rooms. Gooden dropped in & Gregory in the course of the evening.[80] The latter spoke of the boomerang.[81] Joyce came in for an instant.

9 February
Breakfasted by myself. My father came to me. Spoke of my dissatisfaction with Cambridge. I am not a child & know I must bear it. What passed I cannot record, but it has left an impression of pain, which many would not understand: a feeling that my whole life is to be repented of, & too late.

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[76] Augustus and Julius Hare, *Guesses at Truth, by Two Brothers*. Third Edition. First Series. (London, 1847), 244.

[77] A coaching inn in Jesus Lane.

[78] George Peacock (1791–1858), English mathematician and Ellis's tutor; Trinity 1809; B.A. 1821 (SW and Second Smith's Prizeman, one place behind John Herschel, his friend and fellow member of the Analytical Society); Fellow 1814; Tutor 1823–39. Peacock was elected Lowndean Professor of Mathematics at Cambridge in 1837.

[79] Undergraduates were 'marked' by college servants who pricked holes next to their names in a list of college members, to show that they had attended; a similar procedure was followed to record chapel attendance.

[80] Alexander Chisholm Gooden (1817–1841), Trinity 1836; B.A. 1840 (Senior Classic). He died in 1841, aged twenty-three. See Smith and Stray, *Cambridge in the 1830s*. Duncan Farquharson Gregory (1813–1844), Trinity 1833; B.A. 1837 (5W); Fellow, 1840–44. He was the founder and editor of the *Cambridge Mathematical Journal*.

[81] Presumably a demonstration, with players throwing to one another. Joseph Romilly reported playing with card boomerangs soon after this: J.P.T Bury, ed. *Romilly's Cambridge Diary 1832–42* (Cambridge: Cambridge University Press, 1967), 164–5.

But no more of this – it is felt too much to be ever forgotten. He went off at three. After Hall Joyce came to me & sat till after eight. Gregory came at nine, & stayed till half past eleven. I lighted a bougie,[82] but even this did not immediately dislodge him.

10 February
Chapel. Joyce breakfasted with me; we walked together. Read till two; to St. Mary's to hear Julius Hare.[83] Faith – not an act of the understanding only accountability for belief. Said those who denied it must deny accountability altogether. The cases are not parallel: the idea of accountability i.e. of moral right & wrong is natural to us; but we have no natural feeling that to believe this or that is right or wrong. He gave some elegant & eloquent metaphors to the same purpose – if I will, assuming the thing to be possible, to believe this or that, I must see some reason for preferring the one opinion. What can this be but its truth? & are not we thus in a vicious circle? That faith is not an act of the understanding only need not be disputed, nor that the assent to certain propositions is not a cause but only a condition of our faith. Still it is essential & the motive to the effort to compel our own assent can proceed only from a prejudice in favour of the propositions in question. It is shifting the question to say a man may be guilty of inattention.

Taylor took tea with me.[84] He is enthusiastic about Hare & gave me the 'guesses at truth'.[85]

11 February
I am in waiting & read this morning a chapter from Leviticus, much after the style of Deu's Theology.[86] Marsh told me he would not have read it which would have been squeamishness.[87] I cannot help however thinking that, although this chapter could do no harm in our chapel, yet that lying as it does within the reach of young people of both sexes – contained in a book, which no one can be on their guard against, it may do much mischief. It is idle to say that to the pure all things are pure: the heart may be pure & the imagination susceptible. Walked with Joyce to Trumpington & Grantchester[88] – a pleasant day & pleasant walk. I took tea with him.

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[82] A candle.

[83] Julius Hare (1795–1855), Trinity 1812; B.A. 1816; Fellow 1818; Assistant Tutor, 1822–32; Classical Lecturer, 1822; ordained deacon (1826) and priest (1826). Hare preached on 'The victory of faith'. The sermon was published in his *The Victory of Faith and Other Sermons* (Cambridge, 1840), 1–25. (Great) St. Mary's was, and still is, the University Church.

[84] Tom Taylor (1817–1880), Trinity 1836; B.A. 1840 (Fifth Classic); Fellow 1842. He went on to become a well-known playwright, and editor of *Punch* (1874–80).

[85] *Guesses at Truth, by Two Brothers*. Second Edition. (London, 1838). The authors were Julius Hare and his brother Augustus. Ellis's annotated copy is at TCL, Adv.D.16.7.

[86] 'Deu.' is a common abbreviation for Deuteronomy. As a Scholar, Ellis took turns to read from the Bible in chapel.

[87] Henry Marsh (1817–1901), Trinity 1836; B.A. 1840; Fellow, 1841–9; Junior Dean, 1844–9.

[88] Villages immediately south of Cambridge.

12 February
I was not very well today. Joyce, Gregory & Gooden breakfasted with me. Read some optics; walked on the London road with Joyce; went to Peacock's lecture on astronomy; to the Union, in the evening-debate – 'Justice to Ireland'. Williams opened, in the absence of Frere[89] who has hurt his foot. No one spoke when he sat down & after a pause of some minutes he got up again 'to reply to the silence'. I left him speaking. At Joyce's Gooden came in.

13 February
I had asked Stooks for yesterday; he mistook the day & accepted for today.[90] I wanted to give him a breakfast, so did not undeceive him. To Hopkins.[91] Read a little – Peacock did not lecture, as it was Ash Wednesday.

Walked with Joyce. There was nothing particular in the evening.

14 February
I have got into arrears – & must, as well as I can fill up the void of days. Went to Hopkins and to Peacock's lecture. Read. Walked with Joyce on the London road – we spoke of the analogies which Bacon would put into his 'prima philosophica', & of the unsatisfactoriness of music: its seeming the image of unimagined & desired good & of beauty & of the odours of certain things of which if they are good to eat, people are apt to say they taste not so nice as they smell.

15 February
Read mathematics. Went to see the boomerang[92] but my pursuit was in vain, as the players did not exhibit. Walked home with Stooks & Hudson.[93] Took tea with Cockburn tete-a-tete.[94]

16 February
Only five hours sleep. Stooks & Gooden kept me up late. Peacock did not lecture; heard Gooden recite his declamation;[95] walked with Gooden, Mate & Joyce. To the Union. Read there one of Sterne's sermons.[96]

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[89] John Frere (1807–1851), Trinity 1833; B.A. 1838 (39W).

[90] Thomas Stooks (1815–1874), Trinity 1832; B.A. 1837 (36W), later chaplain to the Bishop of London, 1860–74.

[91] William Hopkins (1793–1866), Peterhouse 1821; B.A. 1827 (SW), the famous "wrangler-maker" and Ellis's private tutor at Cambridge. See Barrow-Green's chapter in the present volume for his coaching of Ellis.

[92] See diary entry for 8 February 1839.

[93] Hudson: perhaps Frederick Hudson, Jesus 1835.

[94] Walter Cockburn, Trinity 1836; B.A. 1841.

[95] The subject was: 'Should Caesar be made dictator?'. Gooden spoke against the proposal, another undergraduate for it. See Smith and Stray, *Cambridge in the 1830s*, 138–9.

[96] Laurence Sterne's sermons were published in 1759; one was included in his *Tristram Shandy*.

17 February
Breakfast at Gooden's. Read till two. Tried to walk, but was driven back by a storm of sleet. Joyce came to my rooms, before hall;– after chapel & took tea. Lingham was with me last night.[97] Told me Warner proposed to him to walk as far as King's & see by Lavater how many of the those they met would be damned,[98] & actually did damn nine tenths. How is he not a demon-worshipper?

18 February
Went to Hopkins; he was just come back from town. The snow made the walk unpleasant. Went out late, met Joyce who is not well – I stayed with him all the evening; he talked of Cockburn, Gooden etc. The latter he has begun not to like – heaven knows why, & blundered out, for I acquit him of mischief making, that Cockburn said he believed Gooden did not like me because I was more thought of in the college than he. The competition between us is that of Goldsmith & the dancing dogs:[99] still even so I can well believe that one lion may think the other a bore, & that bore as he must be he finds it a nuisance to hear of me. But to me this is nothing – I can like him neither more or less, because he is uneasy in himself, he has always a smile & a kind word when I got to him; more I do not want. But it makes me sick to see the hollowness of all this: to see Joyce the reverse of a high-minded man, turning in the depreciation of vanity against a man who has always been kind to him. To see Cockburn, letting Gooden's dogmatism & uneasy jealousy rankle in his mind, & Gooden disgusting his friends, and patronizing Mate's silliness & Allen's sensuality, & finally to see all these, excellent friends worries me most heavily.

19 February
Joyce could not go to Peacock's lecture & by my advice stayed in altogether. I went out late with Gooden – we went along the Trumpington road. A fine day but cold & with snow on the ground. Tea at Joyce's. Cockburn there, playing bilboquet furiously.[100]

20 February
This was an odious day. Joyce came out to me, imprudently I think. I went to Peacock's lecture. Read & wrote with Joyce in the room till late – went out for a little while. Came back & found Gooden in my rooms. After Hall, he & Mate[101] came to

[97] John Lingham (1818/7–1893), Trinity 1838; B.A. 1841.

[98] That is, by giving readings of their skulls according to the physiognomy of J.C. Lavater (1741–1801). George T. Warner (1815–1869), Trinity 1833; B.A. 1839.

[99] 'I know the proper share of respect due to every rank in society. Stage-players, fire-eaters, singing women, dancing dogs, wild beasts, and wire-walkers, as their efforts are exerted for our amusement, are not entirely to be despised'. Oliver Goldsmith. *The Citizen of the World* (1762), Letter 85.

[100] Bilboquet: a stick with a cup on it, to which a ball was tethered by a string.

[101] Richard Pike Mate (1818–1856), Trinity 1836; B.A. 1840 (14W); Fellow 1842.

me. I went to Joyce's. There were several there. Gooden Jebb Cockburn;[102] Gooden & Mate came in, the last was sent for to Jesus by his friend Winter.[103] Came home before ten. Read a little & to bed.

21 February
There was nothing of note today, I walked with Gooden on the Trumpington road at least as far as the lower end of Cambridge.[104] Joyce was with me before, but left us & went home. A bright unpleasant day. Browne[105] asked for my rooms, which I let him have. Took tea with Mate, Taylor having forgotten a half engagement to take me in; he came into Mate's looking for me, & carried me to his rooms. Bailey came in & about eleven Gooden. A pleasant talk, & 'virginibus puerisque' ['for boys and girls'].[106]

22 February
Walked with Taylor in the cloisters; he read me some of the new Cratylus by J.W. Donaldson.[107] Odious day.

Joyce took tea with me. Cockburn came in & I gave him a lecture on achromatism with great energy & moderate success.

23 February
Why I first got into arrears & then into despair I hardly know – perhaps my ink was bad, or the book painful to write in. After nearly two months interval I resume.

17 April 1839
Today was fine, & the first fine day we have had. Taylor came in early & made me go to Blakesley's lecture – on Aristotle.[108]

Went to Peacock & had some talk with him, & walked by myself in the afternoon. Tea at Jenkins's; Hamilton there whom I met at their house last August – a very forward person.[109] I should say underbred, but that these adjectives are dangerous tools. Gooden came in & Joyce & we kept it to ourselves. Joyce & I played backgammon.

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[102] Cornelius de Witt Jebb, Trinity 1834; B.A. 1840.

[103] Charles Winter, entered Jesus College in 1836, but did not graduate.

[104] The south end.

[105] Probably Hon. Geoffrey D.A.F. Browne (1819–1900), Trinity 1838.

[106] That is, without anything offensive.

[107] John William Donaldson (1811–1861), Trinity 1830; B.A. 1834 (Second Classic); Fellow and Tutor, 1835. *The New Cratylus* (1839) was designed to bring German philological learning to Britain.

[108] Joseph Williams Blakesley (1808–1885), Corpus Christi 1827, migrating to Trinity 1830; B.A. 1831 (31W and Third Classic); Fellow of Trinity 1831; Tutor 1839–45; Dean of Lincoln 1872–85).

[109] Alfred Hamilton, Pembroke 1839, migrating to Caius in 1842; B.A. 1844.

18 April
Up earlier than usual. To Hopkins; back to Blakesley's lecture. Read till near two. Gregory came in – brought me a letter from Lubbock[110] to the Editor of the C.M. Journal,[111] falling foul of my demonstration, which he does not understand of the hexagon property which he maltreated in the Phil. Magazine.[112] Lingham took tea; Neale wishes to be acquainted with me.

[19 April][113]
To morning chapel. To Blakesley's lecture. These lectures are very interesting. The next which is to develope the meaning of *politike techne* [political science] ought to have a good deal in it. At two to Joyce's, with whom I walked till hall. Mate came back from town last night. Gooden & Taylor got into a furious argument in hall. Jenkins there, looking mild. Tea at Joyce's tete-a-tete. Sheehan[114] came in, on slight provocation favoured us with a song, then halted, bowing to me as he went out, as if he was butting with his hinder parts at some unseen object. I repented me I had not commended the song which Joyce says was meant for me – but I have the talent of ungraciousness.

20 April
To Hopkins. In our library for a little while. Blakesley did not lecture today. Walked with Joyce toward Cherry Hinton.[115] Tea at Jenkins's. Edward Kater & Wheately there, the latter a handsome lovely lad.[116]

21 April
To chapel. Blakesley's lecture. Gooden came to me afterwards to talk it over – which bored me rather. Taylor came for my [*pages torn out*]

Gregory showed me Lubbock's letter in answer, acknowledging that my demonstration was much better than his.[117]

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[110] John William Lubbock (1803–1865), astronomer, mathematician and, together with Augustus De Morgan, among the foremost English advocates of Laplace's work on probability theory. He entered Trinity College, Cambridge in 1821; B.A. 1825; M.A. 1833; Fellow of the Astronomical Society, 1828; Fellow of the Royal Society, 1829.

[111] D.F. Gregory.

[112] J.W. Lubbock, "On a property of the conic sections," *Philosophical Magazine* 13 (1838): 83–6.

[113] Ellis headed this 'April 18th'.

[114] John Sheehan (1812–1882), entered Trinity College in 1839, but did not graduate. As co-editor of *The Comet*, a satirical weekly paper directed against the Established Church of Ireland, he was arrested for libel, in 1833, and sentenced to twelve months in prison.

[115] A village 3 miles south-east of Cambridge, now a suburb.

[116] Edward Kater, entered Downing College in 1838, but did not graduate. Frederick Wheatley, Trinity 1835, migrating to Downing in 1838.

[117] See diary entry for 18 April 1839.

24 April
Went to Hopkins & came back late from Blakesley's lecture. Took a bath at the Eagle – much better than at the Bull.[118] To Challis's lecture. Walked out with Johnstone[119] to the observatory – they were out,[120] so I walked back by myself.

Jenkins & Mate took tea. Mate to Sam Barrow[121] in answer to a reproachful letter– two of mine have miscarried: I will not & cannot forget old friends, but more than old friends he & I can never be.

25 April
To Blakesley. Read, & to Challis's lecture. Walked with Joyce, & afterwards with Crowfoot; who is a good honest & rightminded man, though I have never taken much to him. After chapel, walked with Taylor on the Trumpington road. He & Joyce took tea, & he stayed late.

26 April
After Blakesley's lecture, I ordered a horse & bought a whip – not a bargain. At two I went out riding by myself, on the Godmanchester road around by Madingley where I had not been since my first term.[122] Between this circumstance, & all the recollections of old days, which riding produced I went on musing & cantering alternately with great satisfaction. Neale & Johnston took tea.[123] Gooden Hare & Joyce came in afterwards.[124]

27 April
To Blakesley. I felt rather heavy in the forenoon. This is an old malady of mine & makes any exertion very irksome. After Challis's lecture read in the library some time. Walked a little with Joyce. In the evening Taylor & I took a pleasant lounging walk towards Grantchester.

28 April
To chapel – declined a pressing invitation from Hare to breakfast; read till near two. Went out to walk with Joyce, but found it too hot. I believe we were 'much in the sun'. Wrote a letter in his rooms. After evening chapel we took a walk & had

[118] Both were inns in Cambridge.

[119] George Johnstone (1818–1897), Queens' 1836, migrated to Trinity in 1837; B.A. 1840.

[120] Presumably George Peacock and his wife. Peacock was Lowndean Professor of Astronomy, 1837–59.

[121] Sam Barrow, a member of a Bath family with whom Ellis was on very good terms. Sam was neither clever nor self-aware and often exasperated Ellis. See Stray's chapter in this volume for an account of their connection.

[122] Godmanchester is a town 20 miles north-west of Cambridge; Madingley a village west of Cambridge.

[123] Probably John Mason Neale (1818–1866), Trinity 1836; B.A. 1840; M.A. 1845; seen as the best classical scholar of his year but took an Ordinary Degree as he could not qualify in mathematics. Johnston is perhaps George Dempster Johnstone (Trinity 1835) or George Henry Johnstone (Trinity 1837).

[124] Edward Hare, entered Trinity College in 1831, but did not graduate.

tea – I felt rather unwell. Gregory sent me the proof of the paper of mine which is to appear in the next number of the journal.[125]

29 April
To Hopkins; he called me back to ask me to come in the evening. I was late for Blakesley; read & lounged till twelve then to Challis, who did better today. Looked into our library, read till Hall; took a few minutes walk after it. I am keeping quiet & out of the sun. Gooden Hare & Jenkins took tea with me. Hare with me as far as Fitzwilliam Street. There was nobody not of the gown at Hopkins's.[126] Smith Green Challis Kell and Gregory Ball Goodwin & O'Brien &c; Green in short white trousers.[127]

30 April
Blakesley did not lecture. I went to the lecture room & on to Gooden's where I found Jenkins. Went to J.M. Heath to [get] his advice about Locke's Essay.[128] It is that it will not pay. I stayed in my rooms all the afternoon – the heat being excessive. After chapel, walked with Taylor. Tea at Joyce's.

1 May 1839
To Hopkins: we are to begin the figure of the earth & spoke of the long vacation. Read in my rooms. Walked as far as Downing; read the Cenci.[129] After chapel took a walk with Joyce. Taylor came in & took tea with us. It has struck me in reading the Cenci, that unless a man be & be content to be Epicuri de grege porcus [a pig from Epicurus' herd']][130] he ought to have some duty so sacred, some dishonour so abhorred in his own mind that he feels he could to fulfill the one or avoid the other face the rack or the stake.

To be a martyr for a dogma is not given to every man – a searcher – & an inquirer will hardly be convinced so jealously as to be ready to die for a matter of opinion. But there are somethings for which I would be proud of martyrdom. I look in upon myself on my careless or petty care-filled thoughts, & I ask if there is that within

[125] Ellis published two papers in the *Cambridge Mathematical Journal* of May 1839: 'On the existence of a relation among the coefficients' and 'On the achromatism of eye pieces'. See Crilly's chapter in the present volume.

[126] Members of the University, as opposed to 'town', local residents.

[127] Archibald Smith (1813–1872), Trinity 1832; B.A. 1836 (SW and First Smith's Prizeman); M.A. 1839; Fellow 1836; one of the founders of the *Cambridge Mathematical Journal*. William Green (1822/3–1890), Trinity 1840; B.A. 1844. John Ball (1818–1889), Christ's College 1835; B.A. 1839 (41W), but as a Catholic could not graduate. Harvey Goodwin (1818–1890), Caius 1835; B.A. 1840 (2W); Dean of Ely, 1858–69; Bishop of Carlisle, 1869–91. His third son (Caius 1873) was christened Leslie Ellis Goodwin. Matthew O'Brien (1814–1855), Caius 1834; B.A. 1838 (3W); Junior Fellow 1840, but resigned in 1841.

[128] John Moore Heath (1808–1882), Trinity 1826; B.A. 1830 (27W); Fellow 1831–45; Assistant Tutor, 1833–9; Tutor 1839–44.

[129] Shelley's tragedy *The Cenci* (1819).

[130] That is, an Epicurean, hence a believer in the importance of pleasure.

which could bear to be baptized in that baptism of fiery woe, which they have been baptized in, who are remembered & revered as martyrs. I sicken when I think on the manifold tortures of hearth of mind of body which from the days of righteous Abel man has inflicted on his brother. Is there any tie so strong, any love so perfect, as to cast out the fear of these things? Yet if not, what am I but a worm – whose strength is only in it's birthright of dying?

2 May
Down late. Read Pratt.[131] Jenkins came in at half past ten, an hour when no one ought to call stayed & bored me though he saw I was busy. To Challis's lecture. Read in our library & in my rooms. Took a short walk. Played backgammon with Joyce. After chapel, we walked together. The evening is colder than it has been. A letter from S. Barrow. Nothing in it. Joyce took tea. Talked foolishly of my getting into parliament. With any one else I should have suspected treachery. Hare came in.

3 May
To Hopkins. Spoke of the degrees; half dubiously, & I believe very truly. I thought this ought to be mentioned & told Joyce of it: which led to some discussion. After Challis's lecture I resumed it. He had spoken as it seemed to me both last June & now in a way which showed considerable carelessness of my feelings. The truth is beyond being the best natured fellow in the world, he cares but little for any body in it. Something of this kind I unwisely told him, unwisely because though true & though it did not lead to a misunderstanding, it cannot but be remembered. I am afraid Joyce & I will not long be sworn brothers. That he is tired of his idol I cannot be sure of, but he finds out that I do not respect him, & that he puts incense on the altar of an unpropitious deity. I am not naturally exigeant – perhaps he makes me so to him.

Tea at Jenkins's. A large party. Kater Wheatl[e]y Pearson Gooden Mate Joyce Lane & the Pembroke savage Hamilton.[132]

4 May
I was imprudent enough to ride today. I begin with this as there was nothing to mention earlier & took a trail in the sun on a horse who stumbled every twenty yards. Went to Frere's the bachelor's after Hall: a good many Trinity men & Goodwin whom I talked to. I was to have taken tea with Neale but found his door sported in the Cambridge phrase.[133] Walked with Jenkins in Downing. He came to have tea.

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[131] John Pratt, *Mathematical Principles of Mechanical Philosophy* (1836). John Pratt (1809–1871) was Third Wrangler in 1833.

[132] Henry Hugh Pearson (1815–1873), Trinity 1836, but did not graduate. He studied music in Germany, 1839, becoming the Reid Professor of Music at Edinburgh University in 1844. Probably Theophilus William Lane, Trinity 1836; B.A. 1841. The 'Pembroke Hamilton' is probably Alfred Douglas Hamilton, Pembroke 1839; B.A. 1844. For the other names, see 18 April 1839.

[133] With the outer of two doors shut; often referred to as 'sporting an oak'.

Gregory came in his shirt sleeves, a cup and ball in his hand.[134] Neale came to apologize – Taylor & Joyce.

5 May
Breakfasted with Joyce, after chapel. Went to my rooms & read till half past one. Too hot for St. Mary's or for walking: Joyce & I lay on the back[135] of the Cam in our gardens. Gregory joined us; he stayed till Hall. After evening chapel, took a short walk with Taylor & Joyce; the latter & Mate took tea with me.

6 May
Down very late: breakfasted & to Hopkins. Back in time for Blakesley's lecture. Challis showed some experiments of polarization which were worth seeing & for which the sun was very favourable. In the afternoon it grew cold & uncomfortable. Tea at Neale's: tete a tete. A man of exalted sentiments, & unclear habits. Jesting apart, however, he is a person of some imagination, who professes & probably holds those opinions on various subjects which are taken as tests of elevation of mind. That they are so I am not sure: and a good deal of it, I mean of Neale's tone, arises it strikes me from his being at present a man who fancys himself very much in love, & makes religious feeling and the universal feeling of beauty with it. By and bye, when Mrs Neale is the 'dusty & deliquescent wife of a second rate country clergyman'[136] we shall hear no more from him at least, of the influence on a man's future state; of the ties he forms here & so on; neither shall we have any speculation whether Caroline or Fanny be the better name for the sunnier of Lingham's 'Bride Leonores'.[137] These things are well, when they spring from the quick spirit of youth – they hardly show well in a recluse & perhaps a morose one.

7 May
To morning chapel, & Blakesley's lecture. Challis gave some more experiments. I stayed in my rooms till three. Met Jenkins who took me to call on Kater, but he was not within. I went to the Dean this morning about my weekly bill. It is it seems Fitzhenry Ellis's.[138] Walked by myself in the evening on the Trumpington road. Tea at Joyce's. He came to my rooms & we played backgammon.

8 May
To Hopkins: he was going to the Vice[139] at ten so I got back in time. A letter – my father better, but has been worse than I thought, at least more confined. Col. Bailey's son has proposed to Penelope Ellis, but there is a deficiency of cash. I remem-

[134] To play bilboquet: see the diary entry for 19 February 1839.

[135] The backs are the area lying between the colleges and the River Cam.

[136] A quotation from Sydney Smith's *Third Letter to Archdeacon Singleton* (London, 1839), 28.

[137] Perhaps a reference to Gottfried Bűrger's poem 'Leonora' (1796).

[138] Fitzhenry Ellis, Trinity 1836; B.A. 1840.

[139] The Vice-Chancellor.

ber him, now that the matter is recalled to my mind, before he went to India: he was then said to be engaged to a Miss Veran; they used to go about 'faisant les doux yeux' ['making eyes at one another'] in a little open phaeton, the father driving, & the lady's sister, to save appearances, perched on the 'dickey' beside him.[140] This was not a thing to catch the attention of a mere boy, for I knew none of the party but the father; & I remember with a little start that it is just six years ago. I think my cousin might do better setting aside the money matters, although I know no harm of the man – beyond what is implied in his parentage.

Lay on the bank of the river before hall; walked with Joyce in the evening. The ministry out: 'La violette repartira au printemps' ['The violet will return in the spring'].[141]

9 May
To morning chapel in the wet. Read all the morning. Being Ascension day, there were no lectures at least from Blakesley. Challis's lecture very good & very interesting; his view with regard to polarization. Walked with Joyce – a cold damp day – he had but just breakfasted. Gooden came to me early to talk about Hadley's sextant. Came to my rooms & wrote but some notes on Challis's lecture. Read some time after hall. I have been industrious today. Went to Decks's to get some solution of opium; the shopman asked me if I knew how to use it. He ought to have known me, but I suppose he had an idea equally lively & just of the misery of a 'good man's' existence.

10 May
To chapel, and to Hopkins. After Blakesley's lecture went to offer congratulations to Peacock, as dean of Ely. He spoke of the arrangements to be adopted in the college after his leaving it without mentioning what they were, as the probable fulfilment of plans which he had long had at heart. Half unwell at Challis's lecture. Read hydrostatics. Walked with Joyce. Left my rooms about half past seven – met Lingham & walked with him. Neale's friends have set up a 'Camden Society', he president, flanked by the sizars. The object is church architecture – they have a composition to be applied with tissue paper, for taking facsimiles of inscriptions. This Thomas gravely proposed to call the 'Ecclesiastical Apparatus'. Joyce & I took tea at Mate's Gooden came in. Joyce went at tea; I foolishly stayed till past twelve.

11 May
Got up headachy & went to chapel. I read, but not well. Blakesley concluded his lectures. Challis did not lecture. Called at the Observatory Joyce walked there with me, & as I did not find them, the Challis's at home – we went on farther. Headache all the evening wrote to Sam Barrow. Jenkins took tea Gooden came in.

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[140] Dickey: an external seat on a carriage, sometimes used by servants.

[141] The Melbourne ministry had been defeated on 3 May on a bill to suspend the constitution of Jamaica, but survived until 1841.

12 May
Breakfast with Gooden at Joyce's. Jenkins called by appointment to take me to hear Carus preach,[142] but we could not get seats so came away. At two he called to go to St. Mary's,[143] but it was wet & I did not like to go in the rain & sit half damp; so the two good intentions made one good action & my conscience was satisfied. At Mate's after hall. Jebb Gooden Joyce there – the latter took tea with me. We took a walk after chapel, on the Trumpington road, at least as far as the pavement – in contact with all obscene vice.[144] It is enough to make one sick. Jenkins reports that I am to get the declamation prize.[145] My mind was never set so high – but the news is not true.

13 May
To Hopkins. He gave me some papers to get copied. Challis concluded his optical course, & began with fluids. Walked with Joyce nearly to Trumpington. After hall read somewhat, but found myself faint & cold & confused – so turned out & had coffee at Joyce's. We lounged out on the Trumpington road & in the fields. Taylor asked us to meet Walton.[146] Had tea & came away at ten.

14 May
Down late. Read till Challis's lecture, which was amusing. Walked with Joyce. Met Mr Challis, who asked me to tea. Read till hall, & after till chapel. Walked with Gooden on the Trumpington road. Joyce came out with me in a fly to the observatory: he liked it so much that he proposed coming out for me when I came back. Saw Warren & his wife, Brownlow Maitland & one or two more.[147] I reminded the former of his civility to me ages ago when I was at Papworth.[148] I would not give up the recollection of some hours since passed for a good deal, though heaven knows there have been some unpleasant enough. I was obliged to ask Maitland if he would take a place – so in he got, staring at Joyce in the dark. I was in convulsions of suppressed mirth at the absurdity of the friend in waiting, although half annoyed at it.

[142] William Carus (1791–1859), Trinity 1821; B.A. 1827 (18W and Ninth Classic); Dean of Trinity, 1832–50. A leading Evangelical.

[143] Great St Mary's, the University Church.

[144] Ellis presumably witnessed men being solicited by prostitutes.

[145] The 'Hooper Prize', awarded each year to three students for an English oration to be delivered in Trinity College chapel. Ellis finished second, after Lord Napier. See Verburgt's chapter for the details of Ellis's declamation.

[146] William Walton (1813–1901), Trinity 1831; B.A. 1837 (8W); Fellow of Trinity Hall, 1868–85; Assistant Tutor, 1868–85. He was known for his eccentric dress, usually wearing a Scotch bonnet and plaid.

[147] Brownlow Maitland (1819–1902), Trinity 1833; B.A. 1837 (7W); M.A. 1840.

[148] Papworth St Everard, where Ellis had spent several weeks being coached by James Challis in 1834 before being obliged by illness to go home to Bath.

15 May
Hopkins was engaged this morning at the Senate house. I went to his banker & gave him a cheque on Mortlock £42,[149] for three terms. Gooden came to me about some optical difficulties.

Challis exhibited some common experiments of the airpump. Sir G. Gibbs[150] used to say, he hated the airpump & the electrical machine. Walked with Joyce before & after hall. A strange blightly [sic] day. Took coffee with him. At Mates.

16 May
Late for chapel. Read. Challis's lecture has not much of interest – pumps & such like. Rode to Trumpington, across to the hills from whence the view is fine, Ely being well seen; then down to Fubourne & back by Cherryhinton. At Fulbourne I was in my first term, walking with Joyce. The difference between May & November & between a freshman of ten days standing & a scholar of Trinity – perhaps also the difference between nineteen & twenty one – made the impression; it left now & then very dissimilar. I hope also I have gained something in health of mind by my own efforts, as well as by the influence of circumstances: Lingham tells me Warner has sent a message to me, to say his marriage is off. I was to be told of it, because I 'take an interest' in the lady. I was unconscious of it, farther than the interest one takes in every acquaintance.

17 May
Went to Hopkins; found myself unwell after returning, shut up[151] & kept quiet. Jenkins came to me & Joyce. Read the Diversions of Purley. Saw Sudbury[152] Gooden & Hare came in after hall, & again in the evening Joyce took tea; we played backgammon. I could not win.

18 May
Much the same today. The day was superb. I went out for an hour & lounged in the courts. Met Challis, J.M. Heath, Whewell[153] & Stooks. Dined in my rooms. Jenkins called & sat some time. Yesterday he talked of small pox in a very edifying way remarked that inflammatory cold was often the precursor of it, & that weak eyes of which Joyce complained, were symptomatic. My share of the omen I laughed at, but Joyce went to Sudbury in a stew, to know what the matter was. Today however he kept clear of this pleasing subject.

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[149] Morlock's was a local bank.

[150] Sir George Gibbs, often encountered by the teenaged Ellis in Bath.

[151] In other words, sported his oak (see 4 May 1839).

[152] A doctor Ellis consulted on several occasions.

[153] William Whewell (1794–1866), Trinity 1812; B.A. 1816 (2W and Second Smith's Prizeman); Fellow 1817; M.A. 1819; Assistant Tutor, 1818–23; Tutor, 1823–39; Professor of Mineralogy, 1828–32; Knightbridge Professor of Moral Philosophy, 1838–55; Master of Trinity, 1841–66; and from 1858 Ellis's brother-in-law.

19 May
Better somewhat today. Read a little. Jenkins called & Joyce with whom I walked on the Hills road. Dined in my rooms. Taylor came in, brought me Milnes[154] – remarked what I think true, that his is the poetry, which every man of sensibility will find in his own mind. There is however a good deal of imagination now & then & sometimes it adheres but badly to the 'subjective' parts. Pearson's Canzonets[155] are just published. Taylor is full of them. Took tea by myself, the first time this term.

20 May
I went out more freely today. Went to see Peacock made a doctor of divinity – a great many absurd ceremonies; walked towards Trumpington with Joyce; exceedingly oppressive. Went to my rooms – read & wrote a letter.

21 May
Went to Hopkins – Joyce & I got together reading & talking. Tried to get in at the Fitz William[156] but it was Whit Tuesday & a holiday. Lounged about unsettled every way. These notes I write on Saturday.

22 May
Examination begins today. In eight hours – all mathematics. Did indifferently. Nothing to mention.

23 May
Acts paper[157] in morning, low subjects in evening: unprepared & did badly.

24 May
A holiday: the Queen's birthday. I was overwrought & thankful for it. Breakfast at Joyce's; wet day, Jenkins came in. Went to Peacock, seemed surprised at my complaining of doing ill. I am not out of favour, but it is going by: I cannot say the bubble has burst, but my reputation was overstrained & is fast sinking.

25 May
In seven hours & a half. Again all mathematics. J.M. Heath hinted to me Rawle[158] is dissatisfied with my paper. It is odd that with apparently more advantages than before, my success should be less. I believe the first 'bruit sound'[159] of failure does more to convince one of the vanity of pursuit than anything else. College reputation is the most ephemeral of all instable things – a woman's beauty is

[154] Richard Monckton Milnes (Lord Houghton), Trinity 1827, poet and socialite. His collection *Poems of Many Years* was published in 1838.

[155] Hugh Pearson set some of Shelley's poems to music; his Canzonets were published in 1839 and 1840. Pearson migrated to Germany, and in 1843 changed his name to Pierson: N. Temperley, "Henry Hugo Pierson, 1815–73," *The Musical Times* 114 (1870), 117–20.

[156] The Fitzwilliam Museum in Cambridge, founded in 1816.

[157] An examination paper on the Acts of the Apostles.

[158] Richard Rawle (Trinity 1831); B.A. 1835; Fellow 1836.

[159] Loud noise.

nothing to it. Some one says she is gone off, another that it was all delusion, a third set up a new idol; or at best in a few years she must pass into the have beens. So pass I: I am already out of date. I begin to feel, not bitterly but I hope calmly & quietly that 'the world first makes us thirsty & then gives us bitter waters to drink'.[160] I turn more to childlike feelings & toy to put away the ideas which have been engendered latterly. I know that a child or childlike I can never be – nor would I think from the strife of life, in which we are all engaged, but I would learn to look upon it as a duty & not a pleasure.

26 May
Breakfasted with Joyce; got my exeat;[161] lounged with him. Am faded & unwell. Came to my rooms. I began to write a letter – he is to read. Jenkins came in & near hall time Augustus Moore, who amused us a good deal. We went late into hall. Walked a little after it with Jenkins. Met D. Heath who set yesterday's paper: says the 'bookwork' part was not quite the thing.[162]

I talked to Joyce today about it all:– told him I had for some time felt that I had culminated. He was inclined to deny it: but so it is & I feel more self satisfaction in the calmness with which I acknowledge it; than any success could give. I thank heaven I never lived in these things, when the tide was flowing the fastest.

27 May
Did badly. It required some patience to bear this bad luck, as I looked to today for success. Fortune is coquettish & has jilted many a better man than I. I heard in the evening that Whewell is pleased with my papers.

This day three years was the radical meeting, chartist was not then the word at the Guildhall.[163] We had a dinner that day. If any one of the company had ratiocinated – had told me, that returning to Cambridge after illness I should come out first in my year that the year after – I should be triumphantly elected a scholar at the first time of sitting, that losing the next term, I should still be first & without a second, that I should be spoken of, caressed & flattered, & finally that in three years time the sun would be going down while it is yet day: that I should write Ichabod Ichabod[164] on all the books & papers that came in my way: I should not only have wondered but have contemplated the prospect with feelings unlike those the things themselves have produced.

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[160] Richard Sharp's 'On the passions', in *Letters and Essays in Prose and Verse* (London, 1834).

[161] Literally 'let him leave': a form permitting an undergraduate to leave Cambridge, signed by his tutor.

[162] Dunbar Isidore Heath (1816–1888), clergyman and Cambridge Apostle, prosecuted for heresy in 1861. He entered Trinity College, Cambridge in 1833; B.A. 1838 (5W); Fellow 1840–7.

[163] The Chartist movement was founded in 1837–8.

[164] A biblical reference (1 Samuel 14.21): Ichabod was named for the departed glory, the Ark of the Covenant having been captured by the Philistines.

28 May
The examination concluded today – went to the Fitzwilliam with Joyce. I noticed in the short time we stayed (Joyce has no taste for pictures) a holy family by L. Da Vinci, a portrait of Rembrandt, a landscape of G. Poussin & a curious interior of Albert Durers. There is a curious picture by Hondius, a ship on the ice at Greenland.[165]

Walked in the evening by myself.

29 May
I breakfasted yesterday with Lingham Walton, Rayner, Robinson the Bell Bridges[166] & another. Hurried & dull. Gooden came to ask me to breakfast tete a tete, which I did – he is going to give a great party, but eat breakfast with me. Off at ten. Cayley[167] in the coach, the great man of the freshmen. He has my pity, yet probably needs none. Found all at home much as I expected, my father still lame & suffering.

30 May
I wrote to Taylor, to desire him to send me word of the result of the examination. Did little else – the day oppressively warm & blightly. Went out late with my mother to meet or find Evans. Met Trevelyan: his groom's horse reared & threw his rider – not much hurt. Affleck came up, with an invitation to Penelope & me to dine.

31 May
Lounged in the garden. Read magazines all the morning. Walked by myself round the heath. Dressed & went in a coach as far as Tottenham Court Road. Here we were told to wait for another which would take us to Charing Cross. An old man, a passenger, was exceedingly angry at this somewhat cavalier treatment; I was amused with him, & sorry I had not time to stay & see the end of his fume. Found Fanny not looking very well. Mr & Miss Louisa Paul & Penelope completed the party. Mr Paul is the clergyman of Finedon, & has a family of handsome daughters.[168] The mother and daughter both ladylike: I was not smitten but think the latter handsome – but she looks much out of health. I believe it is very hard to say, what makes one like people at first, or not. Some one can find a distinct fault with; but when one cannot, there is still a wide difference in the impression left. Perhaps there is always some prestige in a person's favour, in the ease in which one feels at first that one could like a person; & it may arise either from accidental causes or from the overflow of quiet & pleasant thoughts, which well forth from one's own

[165] Abraham Hondius (1631–91), Dutch painter known for his depictions of animals.

[166] Robinson is perhaps Thomas Robinson (Trinity 1836); the Bell Bridges were perhaps the brothers Brooke and Nathaniel Bridges (Trinity 1836).

[167] Arthur Cayley (1821–1895), Trinity 1838; B.A. 1842 (SW and First Smith's Prizeman); Fellow, 1842–53; Tutor, 1843–6; Sadleirian Professor of Mathematics, 1863–95.

[168] Samuel Paul, vicar of Finedon, Northamptonshire, from 1810.

mind & mingle with external impressions. However this may be, I did not fancy the Pauls.

1 June 1839
The first of June nine years ago, I remembered as connected with an act of boyish moral courage, which I look back on with uneasy satisfaction. The next, I recollect, I took one of the quiet rides with Miss Barrow & Lousada, which I used to be so fond if.[169] Five years ago I remembered anticipating going to Papworth, & all the glories of Cambridge; the year after, this pageant had vanished & in a bitter & healthier frame of mind I lay in the lawn at Dalham,[170] & rejoiced in the returning feeling of health, & the brightness of opening summer. Another year, & I was looking forward to leaving Bath, and many sources of pleasant regret supplied me half of my meditations – the other Cambridge & my bitter dislike to it, gave rise to. The next first of June came Joyce's letter, that I was first man of the year & then perhaps I lost a certain freshness & purity of mind: vulgar & trivial ambition began. What three years before was the vaguest of dreams, was now realized & palpable: Again the next was last year's & fell on one of my most successful days of examination; yet remember turning from the turmoil with 'heu quantum minus est'[171] to think of those I once loved, & whose love is now, as it had never been. I spent the morning in the garden with my father, & did not go farther till late in the evening when Penelope & I walked on the heath beyond North End. Read the Guesses at Truth. Much of it is unsatisfactory, & I am not sure that there is not a little intolerance & clerical sleekness in the tone.

2 June
Did not go to church; scarlet fever being prevalent. Walked out with Penelope on the heath till three. In the garden with my father. Read Wood's Algebra: dull but useful.[172] In the evening to Westend with Penelope. Read Rower's paper in the Math. Journal.[173] It is prosy rather.

3 June
I expected to hear from Taylor today but did not. Read somewhat. Went in to dine at the Temple. Called at Gooden's – he was out. Met his mother; as I was escaping after writing my name, through lack of a card. A gaunt Scotch woman – I did not very well know what to do. Gooden's is in Tavistock Square:[174] so I called pour

[169] Lousada Barrow was a childhood friend with whom Ellis had often ridden in Bath.

[170] Dalham Hall near Newmarket, ancestral home of the Afflecks, owned since 1838 by Ellis's brother in law Sir Gilbert Affleck's father, Sir Robert Affleck.

[171] 'Heu quanto minus est cum reliquis versari quam tui meminisse!'. 'Ah, how much less it is to engage with others than to remember you'. The ending of a memorial by the eighteenth-century poet William Shenstone on the death of Maria Dolman, much quoted and later made subject of a poem by Byron ('And thou art dead, as young and fair').

[172] James Wood, *Principles of Mathematics and Natural Philosophy*, 4 vols. (1790–9). A classic elementary textbook.

[173] Paper not found.

[174] The Gooden family lived at 33 Tavistock Square.

passer le temps at the Hunters. Found Mr Hunter[175] at home with two daughters; one of them fearfully like Evan; Called at D'Eyncourt's & went to the 'temple' with him. Talked to a man I sat beside – a very fat fellow for his age & a little of a coxcomb, but conversable.

4 June
A letter from Taylor. I am first as I reckoned on being.

Nevertheless I cannot say I am satisfied.

Walked with my father on the down: the first time he has been there. The Whites invited Penelope & me to tea. There were there the Maberlys & the cousin Whites – White[176] of Trinity with his arm in a splint singing 'a faire mourir de rire' ['to make one die of laughing'] – which was true more or less of all who made the attempt.

5 June
Read as well as I could all the morning; & in the afternoon went in to town. Called on Sam Barrow. Saw him & his brother Ben. The latter just set up on his own account. They lodge together in St. Janus's Place. Sam told me no news: said he saw Lady Arran last winter, who shook hands & seemed glad to see him while another old friend the Miss Jenkins of three years ago was not so gracious. Poor Sam feels such things & one cannot blame him. Dined at the Temple. Sat beside a Trinity man, a bachelor Law Williams of Trinity, & others of the college.

6 June
Went in again to the Temple. Went straight in, & out again. Sat beside Christie of our college.[177] I think he deserves his character for annoyance & an overbearing tone. Williams asked me about Joyce, but I could tell him nothing. I left my cab by Roslyn House & walked home – a lovely evening. Afterwards with my mother & Penelope on the heath.

7 June
Read & lounged in the garden. A damp day. My father & I walked as far as Gen. Orde's house; came back in a gentle shower, or rather wet mist. Read the new no. of Nickleby. I think the characters are more caricatured than in the Pickwick papers & the scenes less: probably because the author has real talent for incident & has more the command of it than before; while his delineations of character being like Claude's figures thrown into the bargain must either be monotonous or distorted, & writing 'ad captandum'[178] he chooses distortion.

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[175] The antiquary Joseph Hunter (1783–1861) had been a leading member of the Bath Literary and Scientific Institution. His eldest child, Evan, born in 1816, was known and liked by Ellis.

[176] Probably Richard White, Trinity 1835; B.A. 1841.

[177] William Christie, Trinity 1832; B.A. 1838.

[178] To catch the reader's attention.

8 June
A note from Gooden – I had written to him on hearing from Taylor, that he had done so admirably in the Aristotle paper, as to get 100 marks over the maximum. He had heard it already, but wrote after due consideration to thank me. I had half a wish to write an ode on a distant prospect of a dinner in Tavistock Square.[179] Went in to town to a lecture on Bacon at Willis's rooms.[180] The first part, on the schoolmen amused me. The second on indirection was the ordinary 'talkee talkee'. On the heath in the evening.

9 June
Did not go to church. Read off & on as people say: lounged in the garden but did not go beyond it all day. Wrote out the lecture I heard yesterday, on three sheets of large paper in an hour & a half; in the evening walked with my father in the garden & read the Edinburgh Review. There is a very gross absurdity in an article on the Statistics of France, with regard to mixture of races.[181]

10 June
This day three years I dined at Freshford[182] & behaved in what I should now call a very unmannerly way – got first hipped[183] & then out of humour or perhaps the other way. The thing would not be worth recalling, but to notice first Mr Napier's extreme forbearance and kindness, & secondly that I think I am a good deal improved in some respects. In the first place, I feel more strongly the restraints imposed by society, in the second, my temper though not what I wish, is both more even, & more under command. The first I attribute to the society of those I have met in Cambridge; the second partly to the same cause, partly to the wear & tear of the life there which obliges one to keep cool, if one would have any peace at all & also to the development of energy & manliness which, after all, the contention of mind & finity of purpose required by the system produces. I acknowledge this, while I condemn the evil tendencies of Cambridge, as much as Warner.

My father & I went into town to Cook's & elsewhere. Took tea at the Johnson's[184] where Penelope dined. I have a half affection for Miss Johnson, for her notice of one whose name even now I would not willingly write – notice is not the word & kindness is too strong. However, I have never forgotten it. Miss Joanna Baillie, there: she bears with her the marks of age; but seems mild & amiable.[185]

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[179] That is, at the Goodens: see diary entry for 3 June 1839.

[180] Willis's Rooms, just off Pall Mall, were the successors to Almack's Rooms, the most prestigious site for high-society socialising in London. They were opened by James Willis in 1781.

[181] "Moral and intellectual statistics of France," *Edinburgh Review* 69 (April 1839): 49–74.

[182] A village near Bath, the home of Colonel, later General Sir William, Napier.

[183] Irritated.

[184] Family friends of the Ellises.

[185] Joanna Baillie (1762–1851), Scottish poet and dramatist.

11 June
A note from Jenkins, who is going to Dundee on a visit with his sister. Had a letter from Joyce, who is going to the Pyrenees with a brother of Cockburn's. Not much in his letter: says half the people at Freshford are gone mad; Fanny told me Mrs Crawford writes to her that two dozen at least of their common acquaintances have been affected with a passing insanity which has been 'going about'. Curious if true – a new & not pleasant form of influenza.

Dined at Fanny's. Miss C. Affleck whom I had never seen, & the M. Impeys; nothing remarkable.

12 June
A very hot day. Read in the morning. Sat in the garden for three hours with my father – very languid, & rather overcome by the heat. After dinner on the heath. A lovely evening. Wrote a note this morning to Mr Bouverie, about his son's going to Trinity.[186] He called at Fanny's yesterday to see me & was there when I came. I had a note in answer in the evening.

13 June
Better today. The weather very hot. Stayed at home all day. Jenkins called. No news – he was going to call on Joanna Baillie; we may trust him for laying his adulation on thick. I hope I am not uncharitable in thinking his graduation no valid excuse for his senseless & undiscriminating flattery. It is indeed like 'a prostitute's favours, as common & as fallacious'.[187] Miss C. Affleck came out to dine with us. We walked on the heath after dinner. Elle n'est pas belle; like all her family, & like Mrs Parry – almost as abrupt too, in manner.

14 June
After Miss Affleck went into town, read, & walked with my father about the heath. Capt. Ellis called yesterday. This *par parenthèse*. A heavy thundering day in the evening, on the terrace with my mother – we heard some thunder & were troubled thereat.

15 June
Read Lardner's Diff. Calculus.[188] Walked to the railway with my father. Major Trevelyan called soon after our return. A letter from Mr Kilbee, taking of coming over.[189] I have not seen him these seven years, & then he was a stranger, as he had not been in England for a couple of years before. On the heath in the evening.

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[186] The son was Philip Bouverie, Trinity 1838; B.A. 1843.

[187] From Oliver Goldsmith's *She Stoops to Conquer* (1773).

[188] Dionysius Lardner, *An Elementary Treatise on the Differential and Integral Calculus* (London, 1825).

[189] Ellis's maternal uncle.

16 June
Up earlier than usual. Read a little; & stayed at home till three, when my father & I went as far as the hill beyond North End, & sat down at the bottom of it. A very fine day. The evening, when we walked en famille round the nearer heath, was lovely – the sunset superb.

17 June
Finished the Diff. Calculus. To Northend with my father: a fine day with a few drops of rain. Penelope & I were asked to Fenton House, & went: there was a family tea party of sixteen – however well bred people may be, it can never be quite pleasant to be among a clique & not of it. Considered in themselves these gatherings of families keep up the feeling of relationship. So far as this is a feeling of kindness all is well, else I should congratulate on having no 'practical' relations. But that it is so always or often perfectly I doubt; & suspect that ill as well as kind feeling is developed by bringing people into close contact. There is no hatred like that which perpetual jarring joined to the impossibility of breaking the tie, produces among those who are the nearest & ought to be the dearest to one another. So of more distant relations in proportion.

18 June
A very warm day. After reading as usual, played backgammon with my father the weather being too hot for walking. On the heath in the evening. Tea at the Whites. A Miss Hill a cousin of the Watsons[190] there, & Miss Nares the future daughter in law. Likewise Mr S. White the youngest son, redhaired & no beauty. This was the company: the entertainment small.

19 June
Worked diligently at integrations. The day hot; sat down at North End with my father for a little time. When we came back found Sam Barrow arrived & Fanny; Mr Affleck on foot & returned with Barrow by coach. Sam much as usual – talked to me of old times; doing which is one of my besetting sins. I trace an unhealthy tone of introspection & retrospection in my own mind. External stimulus is a palliative; but no more; & will I fear, become more necessary and more pernicious, the more recourse is had to it. Connected with this, is a strong tendency of self tormenting, which I can never quite subdue, & a perpetual self consciousness which gives an uneasy stiffness to my manners which does not arise from confidence.

20 June
Sat in the garden after breakfast. The weather still warm. Read for some time, then into the garden, where we sat two hours. Penelope dined at the Wainwrights; on the terrace part of the heath in the evening – the view lovely.

21 June
The morning much as usual. My father & I went into town at two, to Cook's & to some other places. We came out in the carriage, which we met in Vere Street. Got

[190] A Bath family familiar from Ellis's childhood.

some papers at Hodgson's,[191] where were Mrs Harcourt Danby & Mrs Holwell. They say Mrs Holwell complains, the family of parsons &c do not notice her. Such a marriage as her sisters seems to me worthy of contempt every way. The [page torn out]

[28 June]
Curzon Street, where we called. Stayed some time at Fanny's. Nothing particular there. Came out about five. A wet evening. Read Coleridge's 'idea' of the Prometheus.[192] It is curious,– & nobody can say it is incorrect. From what Coleridge says of the possibility of reconciling Plato & Bacon, I conjecture he had a sounder view of Bacon's philosophy than is usual; so far at least, as on a consecrated subject men's real opinions can be.

29 June
Cold & comfortless day. My father & I tried the heath, but dived into the regions of Squire's Mount & the Well Walk.[193] Afterwards went with Penelope to call on the Johnsons who were at dinner. The Watsons dined with us & the Afflecks. We were heavy rather; Anne Watson 'age terriblement'. Mary is too ill for the hand of time to be distinguished. I met with Coleridge's remark: 'Every countenance is a history or a prophecy'.[194] Finely said, & true of her, with whom the past is necessarily everything & on whom it has lift many visible tokens. I feel for her unromantic love story; more than I could for anything less real & less matter of fact; and although the grief must long since have died, it perhaps has left a bad effect on her naturally sweet disposition.

28 June
I find that writing the 30th I have missed this day. It was very wet, & I did not get out at all. Two notes from Sam Barrow touching my calling on his sister, reading, & backgammon – filled it up, one way or the other.

30 June
Dr. White preached: a plain sermon, but not of much more than ordinary calibre. He is an artificial man, & has too much cultivated an artificial manner. My mother & I walked on the London road. Coming back, saw a lad on horseback, who could not ride at all. He rolled off half voluntarily from time to time. The last place we saw him was in our lane, & when we went in; my mother sent James to his assistance, who reported that he was in great fright; & grief for his brother to whom he wanted to make over the horse – James[195] got his brother by chance & our friend dismounted.

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[191] A firm of book auctioneers founded in 1807.

[192] 'On the Prometheus of Aeschylus' had been published in volume 2 of Henry Nelson Coleridge, ed. *The Literary Remains of Samuel Taylor Coleridge* (3 vols, 1836–9). For Coleridge, Prometheus represented 'Idea', and Zeus 'law'.

[193] Roads on the edge of Hampstead Heath.

[194] 'There is in every human countenance either a history or a prophecy': Coleridge, *Literary Remains*, 343.

[195] The Ellis family's coachman.

1 July 1839
Read as usual. Went into the exhibition with my father. I felt unwell all the time; which perhaps was the reason of my being but little satisfied. A [page torn out]

[4 July]
went down hill in consequence. The result was my stumbling on D'Eyncourt on the Barnet road, where he was standing consulting a map of the environs of London – I brought him to take tea & he stayed till ten. He is very gentlemanly man & singularly handsome – that kind of beauty which depends on expression.

5 July
I went into town to see & did see Dr. Chambers & for the first time had the advantage of being *autos ektos* [the only person on the outside] in the coach. Came out in the carriage; In the evening along the terrace: a Chartist holding forth by Jack Straw's Castle.[196] These men are contemptibly mischievous. They & their abettors miscalculate the weight of opposition their cause would meet with, when honest men of all creeds were once roused & united to put down the nuisance by all means & at every risk.

6 July
My mother & Penelope went to Chiswick, & were therefore absent all day. The weather superb; walked in Montague Grove, & the Grove about an hour in the afternoon, & across the heath between eight & nine. Read as usual – the Planetary Theory.[197]

7 July
Mr. Bartholomew, once a curate here, preached; better than the present men are wont to do. A hot afternoon: my father & I took some turns in the Grove. A thunderstorm came on about six, & continued all the evening. There was but little rain, for two hours, or nearly so; thunder & no lightning; afterwards sheet lightning. It was at no time very near us.

8 July
Letter from Hopkins, in answer to one of mine of the 30th. Read, but ill. At three to the Postoffice & up the hill with my father. The storm has made the weather unsettled but not cold. To the Spaniards between eight & nine.[198] This day four years was Julius Caesar enacted at Prior Park;[199] the feelings of those days fade away from memory. But as is natural, they are more akin to those of the present time, than were those of four years previous to them. The difference of thirteen &

[196] A public house on Hampstead Heath, named for a leader of the 1381 Peasants' Revolt.

[197] Perhaps George Biddell Airy, *Mathematical Tracts on the Lunar and Planetary Theories* (Cambridge, 1826). George Biddell Airy (1801–1892), Trinity 1819; B.A. 1823 (SW); M.A. 1826; Lucasian Professor of Mathematics, 1826–36. Plumian Professor of Astronomy and Experimental Philosophy, 1828–36;

[198] The Spaniards Inn, on the edge of Hampstead heath.

[199] A Catholic school near Bath.

seventeen, is more than that of seventeen & twenty one, although the latter is considerable. In 35, I could not have made to feel as in 31, but take away the consciousness of what has since passed & now might dream it over again, with a certain degree of modification of course. My mind goes back to 36, as the limit of the perfect feeling of personal identity. Before this, there is more or less of perplexing variation.

9 July
My father & I purposed going in to town, but could not get a coach. So we walked instead by Belsize House & towards Primrose Hill & were fortunate enough to find shelter during some showers. We were in the garden after dinner, when Mr Kilbee came earlier than we had expected him. Seven years have passed since we had seen him: he is much the same, not less Irish, nor less capable of offending a fastidious person, & I am a good deal more fastidious on some points than I was. However, I like him. Middle life seems to be the most permanent & therefore the most cheerful portion of existence. The day when a boy feels his boyhood is coming to a close, or that when an old man 'finds too late, that all is vanity below' being feelings which are 'bitter beyond bitter' at least to sensitive minds.[200]

10 July
My uncle went in to town early; we at two & to Taylor & Waltons[201] and Dulau's[202] about some books. Then on to the Strand, to Arnolds & Dents;[203] the former an old man in the shop. Out in a cab. Mr Kilbee late for dinner & amusing in his reasons for so being. Out at nine a few minutes.

11 July
A fine hot day. In the garden after breakfast. Read &c &c &c. At four went out with my father; we sat in the Grove & went to & fro, as far as the sun would allow us. In the evening on the heath, Mr Kilbee grumbling gravely on the subject of the hard gravelly road. Backgammon.

12 July
Another fine day, but gray & quiet. Read Precession in Airy, & think it very badly done[204] – With my father as far as Ld. Mansfield's Gate. He got lame: not much though; enough to make me sore at heart. In the evening again on the heath.

[200] 'All, all is vanity below'. Psalm 17.

[201] London publishers, formerly Taylor and Hessey, later Taylor, Walton and Maberly.

[202] Dulau and Co., foreign booksellers, of 37 Soho Square.

[203] Edward Dent (1790–1853) was a celebrated English watchmaker who supplied chronometers to the Admiralty and the Royal Observatory. In 1830, he entered a partnership with John Arnold to form Arnold and Dent, which supplied several chronometers for the voyage of HMS Beagle.

[204] 'On precession and nutation', in Airy's *Mathematical Tracts* (1826).

13 July
At two went in to town with my father. He went only to Coutts[205] & to the exhibition of watercolours where there are some very pretty things. My mother Penelope & Mr Kelbee dined with the Afflecks – who dined with us yesterday – so we were tete a tete. We went as far as the Spaniards in the evening. A lovely day: we saw B. Barrow in town.

[*Pages torn out*]

[21 July]
[…] Welshman I think from his aunt. Walked as far as Ld. Mansfields with my father. Read the Edinburgh Review: Deerbrook is reviewed in it.[206] It is certainly one of those books which lays one under obligation to the author.

22 July
Read 70 pages of Hamilton's Conic Sections:[207] the Afflecks leave town Wednesday, consequently my mother & Penelope went in to stay till evening with them; and did so. With my father towards Mr Plate's house. There was a good deal of refraction on the horizon & Windsor Castle was more visible than I have ever observed it. Read an account of Ivory's paper on fluid equilibrium read before the Royal Society.[208] Ivory is a first rate man, but he stands alone in the view he takes, & in this part of the world, seems to have never been noticed.

23 July
Read Hamilton. Again today we walked on the first part of the heath & got under some trees for shelter. The Afflecks dined with us. Mr Affleck not quite well. There was nothing to be mentioned. They go to the FitzGerald's tomorrow by the railway. Read Hallam's account of Bacon. Hallam is not a fine writer, in either the good or bad sense of the phrase – but a sound minded man.[209]

24 July
We took our usual walk towards Plate's house, which stands in a sufficiently out of the way place. Yesterday we met Dr White in a gig there: he stopped, complained of his head, said he was well in health. There is something odd about him. Today we saw him & Mrs White near the same spot. Noticed a fire on the horizon. As far as Gen. Orde's in the evening. Played backgammon.

[205] A private bank in the Strand.

[206] [T.H. Lister], "Miss Martineau's *Deerbrook*," *Edinburgh Review* 69 (July 1839): 494–502.

[207] Henry Hamilton, *An Analytic Course of Conic Sections* (1834).

[208] Probably in "XXXIX. Proceedings of learned societies. Royal Society," *Philosophical Magazine* 51 (March 1831): 206–210. James Ivory (1765–1842) was a Scottish mathematician.

[209] Henry Hallam. *Introduction to the Literature of Europe in the Fifteenth, Sixteenth and Seventeenth Centuries*, 4 vols. (London, 1837).

25 July
Walked down to a house in Belsize Lane, said to be to be let, & said also to be let, which did not signify, as it is very small. We went towards the fields near Primrose Hill, & returned the same way. In the evening, a short way towards West End. Read Hallam. I like his high commendation of Bacon's Essays. Jenkins had no idea how much he lowered my estimate of his understanding, when he said they were a collection of truisms. Bacon's mind was all vigour, his mistakes in philosophy, his faults of style bear the same character of energy, & strong purpose, as his most successful conceptions. How Jenkins is the most wishy washy minded creature in existence.

26 July
A terribly wet day. We intended to go in to town but did not. My father set to work at setting papers; he has preserved heaps of my letters, worthless enough God knows,– but I read over slightly a dozen of two, beginning in June 38. It was like a nightmare: I could not leave off, but felt unhappy all the time. There is a gloomy unhealthy tone in many; reminiscent of days weary painful at best unsatisfactory, in all. Worked at the equilibrium of fluids; not out all day.

27 July
Went into town with my father. Called on Mr R. Gurney at his chambers in the Temple, but did not see him. To Dulau's. Saw a life of Watt by Arago.[210] Wonders why he was not made a peer. Somehow in the days of the old regime there was more aristocracy than ever here, in France, yet now they are for making all manner of men pairs de France. Probably; because the civil equality here concentrated the aristocratic feeling by confining to it to social inequality, & this removing it from the operation of laws & positive institutions, our free government has perpetuated our system of castes – a system, which for my own part, as no one is less disposed to infringe in individual practice so I should be sorry to see lost. Out in a cab; found there had been a thunderstorm.

28 July
A wet unpleasant morning, but not cold. To church. Colls preached ill, on the Eucharist: said how useful it were for judges and others in authority to communicate. As this is assize time & Tindal was just before him, it struck me as an instance of how strong & continuous the effort of a clergy to exercise spiritual dominion always is. The hills it draws on the other world, if not always honoured, are seldom difficult to connect into this world's wealth & influence.

Towards Highgate with my father. Saw Mr Samuels. He must be an extreme old man, for he was often pointed out ten years since, as a remarkably active man for the great age he had then reached.

[210] François Arago, *Life of James Watt* (Edinburgh, 1839).

29 July
Went in to town at two, with father. We were reduced to the painful necessity of an omnibus: I have a turn for human nature; but can as little study it, when in immediate contact with humanity, as zoology in a menagerie, with the lions & tigers all broken out of their dens. We came out in the wet: ceaseless miserable rain. Read a little before dinner.

30 July
This was a ceaselessly rainy afternoon. There was nothing remarkable in the forenoon – a letter from Fanny at Leamington. Dr Johnson full, apparently of quackery, with all those minute directions which do exceedingly well for those whose taste is for a ceremonial law. As far as Mr Plate's with my father. Came back in the wet, & did not get out again; hopeless weather for the harvest. Worked at Ivory's views.

31 July
It rained the whole day. I did not get out at all, & was tolerably diligent. A note from Couch the curate here asking me to breakfast tomorrow, which I parried by writing him word that my studies could not be interfered with. My father says there is some ulterior end in view – I cannot conceive what it is likely to be – certainly, asking me is rather a quaint proceeding.

1 August 1839
A fine day, the first for some time. Read as usual, went out with my father: the sun troublesome; we are not used to it.

In the evening on the heath. A lovely evening: saw the Whites in their carriage. Played backgammon. Read Hallam – an extract from his remarks on Hobbes.[211]

2 August
Superb weather. Mr Couch sends a note apologizing for forgetting my studies & asking me to dine today. My father says he means to propose for Penelope – I accepted per force. If he is absurd I cannot help it, but could not reject all his civility on a suspicion of it. Certainly there is something requires some explanation. We have been here twenty months – have never noticed him, are acquaintances only by chance. I [am] not properly an acquaintance, & he has been besieging the house these three days with calls & me with invitations, as soon as he found we were going away, which I told him the 20th Ult. I am so nervous, that my father's telling me so, almost prevented my reading & has made me feel quite unwell. I dined with him, & had reason to think my father right. I was thinking all the time how much satisfaction it would give me to kick the little dog. Of a surety, he is a modest man, with a marvelous degree of impudence.

[211] See the diary entry for 23 July 1839.

3 August
We were minded to go into town, but did not the weather being very warm. We walked a little later in the afternoon, where the sun allowed us; and in the evening. I went with Penelope to take leave of the Johnsons whom we saw. Miss Johnson displayed some magnificent pieces of work of hers. She reminds me much of 'long ago'. By the way, talking to my father today of Mrs Swift, I was struck by the length of time I can now recollect. It seems not longer than last months since she was with us but seventeen years, converting her from a young girl into a passée demirep,[212] and me from whatever I was then into the old man I am now.

4 August
Dr White preached, not very well. 'Arise ye for this is not your rest'. Wrote a note to Gregory to accompany my communication for the Journal on the subject of fluid equilibrium.[213] I imagine I have refuted Ivory – judicent alii [let others judge]. Walked with my father beyond Mr Platers towards the Barnet road. In the evening to the Spaniards: the heath very much frequented. Read Juvenal's 13th Satire; Burcham I recollect gave it magnificently.[214]

5 August
Went into town with my father to Charing Cross, Cantis, Dent's. At Charing Cross the Rocket going off; a lad taking leave of his family lifted his mother & little brother, shook hands with his older brother, & went to mount the coach – turned back & lifted him too. I was struck by the contest of manly decorum & affection. Took tea at the Jenkins's. Miss Johnson is very accomplished & well informed but I imagine, feverish restless & unhappy. This day is the birthday of my dear sister, who is with God.[215] I believe, if she had tarried with us, I should have loved her more than I ever did, for during the last year or two of her blameless life, we had grown much fonder of one another; the natural affection of children was beginning to give place to the love of near relations, united by every tie, & kept asunder by no jealousy, by no jarring interest. At this interval of time I can think of her without pain – a very few months indeed passed away, before the heartlessness of childhood prevailed, but not without thinking how much she would have been to me now, & for the future – a vain & passionate thought, which has yet a certain sweetness. I wish I had more memorials: but there is more to be remembered than I shall ever forget.

[212] 'Demirep': a woman of doubtful reputation and chastity.

[213] Robert Leslie Ellis, "On the condition of a system of mutually attractive fluid particles," *CMJ* 2:7 (November 1839): 18–22. Ellis's paper criticised the work of James Ivory.

[214] Thomas Burcham, Trinity 1826; B.A. 1830 (Third Classic); Fellow 1832. His manners and character were disapproved of by conservative Fellows and he was refused a license (character reference) for ordination. See diary entry for 15 January 1840.

[215] Mary Jane Ellis had died in 1831.

6 August
Read – my last time in Hampstead. Called with Penelope at the Whites Hart Davises Hodgsons Longmans Murdocks Priors & Johnsons. Whom we saw & where we saw no one would be endless. I can truly say what I said untruly, why I cannot tell, in leaving Bath: I have no wish to hear any of their sweet voices again – perhaps Miss Johnson's. I should like to hear Mr. H. Davis & Mrs M. Longman sing – they need not. Yet I have no dislike to any of them, & am I hope kindly disposed to all. I liked some of my Bath friends, & why I chose to write in my journal that I regretted no one, is one of those mysteries of perversity which one cannot hope to explain. Adieu Frognal.[216]

7 August
Left Hampstead at nine, got to Hartford about twelve. On with our own horses to Rochester; the Bull where we dined is the scene of the ball in the second number of Pickwick[217] & the scene is evidently copied from nature. To Sittingbourne in the evening. Got some Saturday Magazines; in one I found an exceedingly curious article on the equable flow of sand in an hourglass[218] – tried to consider it mathematically; the results are interesting, from the analysis to fluids – but the principles are much more complicated.

8 August
Breakfasted at the Fountain at Canterbury, & got to Dover about half past four. We are not altogether satisfied with the house.

Dover is not perceptibly changed since we passed through it 37, but very much so from what it was when we were staying here in 33; every day adds to the store of painful thought which accumulates in my mind; and, which is worst, I cannot be satisfied with myself.

9 August
Read as usual; with my father towards the pier. Bought glasses in a dark shop & was deceived as to their colour. We went to the library after lounging about for a long time: a new man has got it. Out a little in the evening – cold & windy. Read 'Elite de Bons mots' an old French book: very dull, – & here & there obscene.[219]

10 August
Out after breakfast. Read. Called on the Duffs, who left cards here yesterday; to the harbour; not much going on. In the evening walked & to the library.

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[216] Part of Hampstead.

[217] Charles Dickens, *The Pickwick Papers*, originally published in instalments from March 1836 to November 1837.

[218] "On the early modes of reckoning time, V: The sand or hour glass," *The Saturday Magazine* 14–15 (1839): 143–4.

[219] *Élite de bons mots et des pensées choisis* (Amsterdam, 1704).

11 August
Went to church – service begins at half past ten. A confirmation is to take place shortly, & the sermon had reference to it. I remember when I was confirmed, Prassey asked me what a Catechism was & with my answers to that & to a second question was satisfied.

My father & I walked with my mother to Charlton, & home by the London road. Read a little before dinner. Took a little walk by myself in the twilight. Met with a mot, worthy of Rochefoucault. 'Peu de chose nous console parce que peu de chose nous afflige'. It is in the book of Ana, which contains some fine things in a heap of pure trash. Of the former, had Barnevelt saying, 'Je n'ai pas demandé grace pour mon mari parcequ'il etoit innocent; je demandois la grace de mon fils, parceque est coupable' [sic].[220]

12 August
Read diligently; at two took a warm sea water bath: no use, but pleasant. I have been ailing more or less, the six years since we were here before – six years which lie in the fairest portion of life, that 'flosculus' ['little flower'] which once lost can be restored never again. The following winter was the beginning of troubles: yet for a year before my mind was clouded my temper soured beyond it's natural fretfulness. Afterwards walked with father under the Castle Cliff & then to the pier. A heavy day, but hardly any rain. In the evening took a little walk. Read Coleridge – the Sibylline leaves.[221]

13 August
Read – curves of curvature on the Ellipsoid: my father & I walked to see the works for the railway. We went out the old Folkstone road, & outside the line of fortifications, saw the works in the face of Shakespear's cliff. There is to be a tunnel under the cliff. A great work, & dangerous withal, as the chalk comes down now & then: certainly, it is an unpropitious country for a railroad. On the pier when we returned- & in the evening to the jetty under the Castle; a quiet place, but this evening, children – tormented.

14 August
We went today in search of shade up & down the High Street; I am not sure this is the name – but no matter. After sitting in the library for some time, down to the Pier & saw two steamers come in, one a Frenchman. The evening was wet.

[*Page torn out*]

17 August
A threatening day with occasional rain. Read as usual. Walked out for some time; in the carriage to River – a pretty place, & one of the few accessible places near Dover.[222] My father & I got out a little in the evening – nothing else.

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[220] Ellis quotes from the book mentioned on 9 August 1839. 'Ana', as in 'Johnsoniana', was often used on title pages to refer to collections of sayings by one or more authors.

[221] Coleridge's early collection of poems, *Sibylline Leaves* (London, 1817).

[222] A village two miles from Dover.

18 August
At Church: could not hear the sermon, out at half past twelve. Walked on the London road with my father. Afterwards down to the harbor, where we saw Capt Duff. In the evening we returned there; saw the man who extracted 7s 6d from my father's liberality in the autumn of 33, & who made an attack on me with precisely the same story a few months before we left Bath. I then engaged the satisfaction of cutting him short, & he halted, as rapidly as an attention to dignity would permit. Music on the parade band of a regiment – I hate 'sodgering'.[223] That peace has its triumphs was thought a great discovery: it will be long before mankind will believe that war has none. Those are fine lines in Sardanapalus: 'the blood he spilt – the realms he wasted & the hearts he broke'.[224] Novimus quae sequuntur [We know what happens in the sequel].

19 August
'A day of rebuke & blasphemy'[225] that is in English: a day of Cambridge annoyance, the fulfillment by anticipation of my ratiocinating three years ago[226] – *panta konis* [all is dust]. Read tout tant bien que mal; a dark lowering day. On the jetty with my father. Read the Life of Ld E Fitzgerald[227] at the library: an enchanting book to me. In the evening out a little while dark & wet.

20 August
Wrote to Hopkins. Read. Took a warm bath & a walk under the Castle Cliff. We were told some days ago that the flints are sold at 3s 6d a ton for making china. Went to the library, the day wet & uncertain: a boat race (oars) in the evening and music. So so.

21 August
A letter from Harmer. He is going to town on returning from Ramsgate – to stay one day on his way to Southampton & proposes to me to meet him at the Soho Bazaar – The letter has been at Hampstead. It is as strange & wild as the writer, with professions of regard & affection which a life time of mutual good offices would only justify. To him it is not hollow – to me it has a chilling & unearthly tone – Read. Called at the Duffs with my father. In the evening we saw the rescue of a sheep who had got so far down the Castle Cliff, as to be unable to return. It was dark however, & we left it; Capt Duff who was there Scotchly [sic: meanly] remarking, that as the sheep was not his; he would not stay any longer. Wrote a hasty letter to Harmer.

22 August
The morning as usual. The Roses called, just returned from abroad; Capt Rose not well, which altered their plans. I walked with my father in the shade & went to the

[223] Soldiering.

[224] Byron's historical verse play *Sardanapalus* was published in 1821. See Jerome Christensen, "Byron's *Sardanapalus* and the triumph of liberalism," *Studies in Romanticism* 31 (1992): 333–60.

[225] A biblical quotation: 2 Kings 19.

[226] Ellis's diary entry for 19 August 1836 has not survived.

[227] Thomas Moore. *The Life and Death of Lord Edward Fitzgerald*. 2 vols. (London, 1831).

library. The Roses took tea with us. I like him, & admire her, which is pithy at least.[228] Talked of old faces & days: little Cogham, since gathered to his fathers, Hill, my friend Febité's patron Dr Barnes, the man of sin, poor Logan[229] whom he introduced to me – an introduction which led to our going to the examination at Prior Park in 34, & my going to the play in 35 &c &c. Things are twined together, in reality & in the mind: & often when one speaks of some apparently insignificant matter there is an esoteric meaning in what is said. But for this, many persons would be wearisome. To understand from what a man says, the train of ideas in his mind, is the last perfection of comprehension of his character.

23 August
Just as we were going out, called Mr Bridges: je ne l'aime pas [I don't like him]. Cuvier fils says of the ruminating animals that you cannot be on your guard with them 'fide sed cui vide?' ['Have confidence, but be cautious in whom you place it'].[230] Saw afterwards at a distance Mrs Bridges. There was military music, such as it was, on the Parade: Browne says that 'tavern music struck in him a deep fit of devotion'.[231]

In the evening to the library & to & fro on the Parade.

24 August
A letter from Joyce dated Perpignan. He spent two or three weeks en route. Reached Toulouse in the beginning of July; stayed two weeks in the Pyrenees with his friends; threw up his books 'as the best plan' determined to cut next term, & to degrade if he can; & set out by himself for Spain. At Perpignan he changed his plan & is going into Savoy, via Piacenza, which convinces me that his geography is a little out of repair. So he is gone to pieces – for one can hardly look upon his termination to his career at Cambridge, in any other light, than as an end to any changes of his settling down to any profession or regular way of life. Things are changed since I dined at his house, when we were both expectant freshmen. Unwell, that is unable to read – quick pulse & head confused – better in the afternoon which we spent as usual.

25 August
My birthday:– two & twenty. No use in sighing over years misspent, or destroyed by circumstances; not much either in hoarding in imagination 'what remains of life'. I dare say it will be long enough to last the average time. I am like the people in Dante compelled to walk on & still look behind them. Regret & retrospection dwell for too much in my mind. Went to Church. A Charity sermon by a Cambridge

[228] Ellis had met Rose in Dover in September 1833 and liked him.

[229] Henry F.C. Logan (1800–84), Professor of Mathematics in the Catholic College of Prior Park, a boarding school near Bath, and correspondent of Rowan William Hamilton (cf. Verburgt's chapter).

[230] The zoologist Georges Cuvier (1769–1832)

[231] 'Even that vulgar and tavern music, which makes one man merry, another mad, strikes in me a deep fit of devotion, and a profound contemplation of the first composer'. Sir Thomas Browne, *Religio Medici* (London, 1643).

man. Walked in the shade of the street. Wrote to Joyce. Read a little astronomy. Took a lounge in the gloaming, being pleasant, but I am still not quite right.

26 August
Read astronomy. Took a warm bath. Went to the library: saw there an explanation of the precept of *apo kuamon apexesthai* [to keep away from votes] – non intervention in politics.[232] Walked in the Streets. Read a little before dinner, to the pier in the evening. Looked at 'Helen'.[233] I am not sure I like it very much. Admirable as all the author's writings are,– I should be always more content with one of Miss Austen's novels. Miss Edgeworth has not always the felicity of making her reader like the characters she intends him to like; & the sympathy of the writer & reader is everything in a work of fiction.

27 August
Peacock's bill – Cambridge postmark June 25th.[234] He had written Bath on the letter in absence apparently & although Hampstead was added the 'Bath' was not sufficiently obliterated & the letter went there. The Bath mark is July 22, then came two London ones Aug. 24th & 26th. I hope the Dean of Ely does not direct letters after dinner.[235] Letter from Hopkins; kind enough; he is going to Boulogne for a day – proposes to meet me there. A bad night; found I had a headache. Read about two hours but could not go on. Read Gent's Mag.[236] Grievous twaddle. Wrote to Joyce – the former letter would not do. Walked on the pier & read, as it happened, the same book as yesterday, Helen, at the library. To the harbour in the evening. Sweet lightning.

28 August
A terrible headache an hour or two last night – better this morning. Read. Wrote to Hopkins declining his proposal. Enclosed the letter to Hoppett. Walked in the streets – there is a good deal of shade in Dover. Summer is going – one more summer. Met Capt. Duff. Read the papers at the library. Looked at Mallett's *Life of Bacon*.[237] Bacon was in the habit of taking nitre with three grains a dose every morning for thirty years[238] – I suppose it lost its effect, else this very unpleasant drug would one would think produce mischief. Walked with my father on the Parade.

[232] Ellis is jesting. Pythagoras urged abstinence from beans, and beans were used to count votes in Athens.

[233] Maria Edgeworth, *Helen. A Tale* (London, 1834).

[234] As Ellis's tutor, Peacock sent him a termly bill for accommodation and other charges.

[235] Peacock had been appointed Dean of Ely earlier in the year.

[236] *The Gentleman's Magazine*.

[237] David Mallet, *Life of Francis Bacon* (London, 1740).

[238] Bacon described them as 'grains of youth'.

29 August
Read, tolerably well: took a warm bath. Stayed a few minutes at the library. An autumn dark day. Walked with my father, first on the Pier, then westward, but we turned from the mist on the hills, & went inland towards the Maison Dieu.[239] In the evening down on the pier, talking to Penelope de omnibus rebus & quibusdam aliis [about everything and certain other things] – the latter being the larger portion. Strange it is, to see how different minds may be, in the formation of which one would expect more similarity than one finds elsewhere. Certainly it is hard to estimate the modus operandi of the circumstances which form character; like the molecular forms in nature – (& not less important in the moral world) – they escape from our investigation. Quorsum haec? [what's the point of this?]. I see in Fanny very much that reminds me of myself: something analogous in the way in which ideas follow one another in the mind. By the way, this seems to me a great means of classification of men's minds.

30 August
Read as well as I could, being distracted by Punch,[240] & very heavy in my own feelings. Count Sebastian[241] came over today & a salute was fired between 6 & 7 AM – rather startling, when one was, haply, between sleeping & waking. This was the day of the Millington festival, the shops all shut, & the streets full of people looking as if they did not what to do with themselves and were expecting somethings very grand – *ti mega kai neon* [something big and new]. But we did not stay in the town but took a long walk on the Folkestone Road. There were some small fireworks in the evening; rockets that went up as cheerlessly as the sticks came down. Altogether it was the most triste significance I ever saw. It was too bad to shut the library on the strength of it.

31 August
The last day of summer – so at least I have always thought it – nor was it much like summer, being windy, dark, & wet. Read, went out late. Bathed – it rained when we tried to walk, but later in the day we went as far as the Pavilion where the entertainment was given yesterday.

The evening very rough & wet. Did not go out. Backgammon & Spence's Anecdotes.[242] The latter a book to give one a headache & a dislike to every one mentioned in it – yet it is amusing.

[239] Otherwise known as the Hospital of St Mary or Domus Dei, built in 1203, and now part of the Town Hall.

[240] Perhaps a Punch and Judy show outside the house; the satirical magazine of this name was founded only in 1841.

[241] His Royal Highness Don Sebastián Gabriel of Bourbon and Braganza, Infante of Portugal.

[242] Joseph Spence, *Observations, Anecdotes, and Characters, of Books and Men. Collected from the Conversation of Mr. Pope and other Eminent Persons of his Time* (London, 1820).

1 September 1839
Wet, so I did not go to church. Headachy. I have been of late more than usually subject to this sort of annoyance. A letter from Warner. He did not get mine, which was directed to the care of Cattley his brother in law, till two days ago. He writes great stuff. Full of regard & expressions of kindness, to which I make but childish answers. I cannot to use a vulgar phrase, get the steam up on such occasions & would not if I could. Walked to Buckland[243] with my father. Not out again till the evening: a very blowing day. A tree drifted ashore, covered with barnacles. This day ten years ago I rode from Weymouth round Chickerill & towards Abbotsbury. 'Oh mihi praeteritos si Jupiter annos' ['Oh, that Jupiter would restore to me the years that are past'][244] was a bold prayer; what could I do with these ten years, if they were thrown upon me again, but weary them through as I did before? I am stuck by Warner's letter; it suggests to me the infinity of new ideas poured into my mind these three years. I am intimate with several I had never heard of. Some of them talk as if I had been 'born in their father's house', yet we got on very well without any acquaintance.

2 September
Read – Astronomy. Bathed. Walked inland with my father & to the barnacle tree which is 'worth seeing'; but I never care to see a thing of which I have a distinct conception. Read the Magazines. They have very little of interest. Bentley's Miscellany suits those who love horrors, & carnal energy.[245] Whoever reads it with pleasure, would go to see his best friend hanged. In August, there were two mad scenes in it; now there is one murder at least, for I laid it down. If there were a censorship, & perhaps there might be, such a work ought to be suppressed. The Murrays, who are at the York Hotel, waiting for a passage, took tea with us.

3 September
Headachy again. Read Astronomy. Wrote out a method for formula in aberration, which has occurred to me, & which I shall offer to Peacock. There is a long report in the Chronicle, which I read at the library, of a bribery case at Cambridge – amusing enough. I see Dillon Browne is there. One of Gooden's charges, so to speak against Taylor was standing up for the character of Dillon Browne.[246] We went 'en famille' to the Murrays to tea, strange man he is. There was nothing very remarkable: the second Miss Murray, like Dr Crawford. I do not generally speaking fancy Scotch people.

[243] A village near Dover, now part of the town.

[244] Virgil, *Aeneid* 8.560. The prayer was uttered by the aged Evander, a local king and distant relative encountered by Aeneas in Italy.

[245] *Bentley's Miscellany* was a literary magazine named for its publisher, Richard Bentley. It ran from 1837 to 1868, when it was merged with *Temple Bar*.

[246] Robert Dillon Browne, MP for County Mayo from 1836 until his death in 1850.

4 September
Unwell in the morning. Read Pliny & nothing else till later than usual. My discomfort went off, but I was very weak all day. I was not right before, but a cup of abominable coffee last night helped to upset me. Walked on the Pier &c with my father. Read at the library. The Murrays came to tea: a merciful Providence carries them to Calais tomorrow. Penelope had a letter from our cousin, the *homonumos* [i.e. also named Ellis], Cheltenham. She seems fixed with Mrs Maxwell[247] – a good arrangement I should say for every Lady concerned.

5 September
Read as usual. Walked to the Pier with my father. At the library; looked at Wm Godwin's Thoughts on Man.[248] I was not struck with the book, but suppose it contains much of vigour & originality; opened Burton's Melancholy.[249] I never could relish the mixture of learning, quaintness, & obscenity, which forms the staple of this admired book. Took some turns on the Parade. We met Capt. Duff. When we were at Hampstead, a place I never heartily liked, to meet any one, we knew was an event; here less so. At Bath one could never go out without falling on some one. I believe this was a better state of things for mental health; yet I am not desirous of returning there permanently. In the Heloise, St Preux writes (I forget the French) that if Julie could remain for ever young & fair, it were enough for him to see her for a moment from time to time, & he approved of her happiness.[250] Even so it is with plans: they remain for ever what they were, nor […]

[5 September]
[…] pass by melancholy degrees from early youth to the fullness of their prime, & then into decay; & for any love I could bear a place, it were enough to see it now & then & to refresh the recollections which endear it. The analogy has perhaps more of truth than seems at first.

6 September
Read – the lunar inequalities, the 9th & 11th sections of Newton.[251] Bathed. Walked on the London road. We diverged to the left to a little church, Buckland I think the name is. Walked towards the pier in the evening. Read 'Northanger Abbey' – not the author's best, but still delightful. There were fireworks, but I did not go to them, but played backgammon – 'le jeu valait bien la chandelle' ['the game's worth the candle'].[252]

[247] Ellis's aunt.

[248] William Godwin, *Thoughts on Man: His Nature, Productions and Discoveries* (London, 1831).

[249] Robert Burton's *An Anatomy of Melancholy*, published in five editions between 1621 and 1651.

[250] Jean-Jacques Rousseau's *Julie, or the New Heloise* (1761).

[251] That is, the *Principia Mathematica*.

[252] A saying from the period when candles were an expensive luxury. Ellis jests: candle = firework.

7 September
Hydrostatics. Walked with my father out on the London road & then turning to the left up a steep lane which was along the side of a range of hills, which form one boundary of an east & west valley. There are here several of these little vallies [sic], parallel to the sea, & they form the prettiest part of the scenery about Dover. Wrote to Gregory. Read 'Persuasion'.

8 September
Read a little; to Church. I find I have mislaid, I am afraid I must say lost my prayer book. The value was small, insomuch that I have been long minded to get another, but I have had it more than fourteen years. C'est tout dire [there's nothing more to be said]. Walked on the London road with my father. Met Capt. Duff, looking ill. An idle man is a happy dog, but they none of them look contented. Read Persuasion – a charming book. It is wonderful how much interest & sympathy one is made to feel for the simple & homely incidents & feelings which Miss Austen paints. I cannot think Hazlitt right, where he says,– the first two pence we are cheated of the first splash of mud we meet with dispels the enchantment.[253] It seems to me that we are taught & some of us retain the lesson to feel more for others for their joys & woes than we should do, were there no such works of fiction in the world.

9 September
Read as usual. My mother & Penelope went to Walmer[254] to fall on the Bridges – my father & I took our usual walk, & came back about half past four. I bathed – I don't think it is of any use to me, at least I have not been better than usual here. The Bridges ask Penelope to dine: she goes & is perhaps right; 'Once to deceive be his, but twice be mine' used to be a favourite maxim with Fanny; I had a little letter from her today.

10 September
Read – not well, hydrodynamics, very heavy, throughout the morning; a close oppressive day. Walked in the town with my father. There was no sun, & we went to the pier. People reading there: an absurdity, begging their pardon. Saw Griffith, 'the man with the gloves' of Trinity. His sisters make a point of staring at me, which is very gratifying. He is now a third year man.[255]

Went out a little in the evening. More & more by every day's experience I am satisfied of the unhappiness of an unruled mind, as mine is: the veriest trifle annoys me, & then the notion of being annoyed redoubles the effect.

11 September
Read – & better, Mr Couch the curate was here. Penelope had a letter from Miss J. White yesterday, hinting he was gone in search of a wife: he left Hampstead for a short time on leave of absence. It is very annoying, but very droll – he has been

[253] William Hazlitt, 'On the feeling of immortality in youth' (1827).

[254] A small town on the coast, 7 miles north-east of Dover.

[255] Edward Griffith, Trinity 1837; B.A. 1841.

tramping up & down all day. The Bridges came to lunch, that is, Mr Bridges Miss Charlotte Affleck & Miss Becket who is staying at Walmer – the elder sister of the one we met at Dalham – also Johnny Bridges, his seventh birthday; we had a huge amount of lunching, walking – shopping for some of us – 'Standing about' & weariness, & I was heartily glad when they started. Mr Godfrey we met, & he was introduced by Mr Bridges.

12 September
The odious little curate called. 'Ship Hotel' – it cannot last for people are made to pay at the Ship. Bathed. Walked to the jetty where a Russian vessel got aground last night, – but floated off this morning & apparently without injury. The afternoon became wet; got some time in the library. I see the man, who some years since blew up the post office at Cambridge was a Trinity man. His name is Brane:[256] he is probably 'gone to the bad' before now. The evening decidedly wet.

13 September
Mr Couch called again, very anxious to see me; he is an original character. We went to Walmer to leave Penelope – saw Miss C. Affleck Mrs Bridges & Miss Becket. Mr Bridges not at home. Miss Becket just unbearable – apparently she took a fancy to me; got me to put a flower in my button hole; & insisting it was put in wrong, took it out & adjusted it her own way. I thought, if she had been thirty years younger, how much flattered I should have been. Three years within a few days since I was at Walmer. I had thought not to return there.

14 September
A very rough night & wet day. Read; about three got out for an hour with my father; we went afterwards to the library. I did not see any news, or any thing else of interest. I see Boz has killed Smike;[257] which seemed the only end he could come to. Did not get out again. Read 'Mansfield Park'. I read it at Ramsgate, three years ago.

15 September
My father extremely unwell. I did not go to church, partly on that account. Walked down to the apothecaries, who is a methodist preacher. Afterwards walked over the heights & on the pier. A blowing day. My father not less unwell when I returned. We saw Dr Nobleforth. Went to bed late & anxious.

16 September
My father much better today, but very much shook. He came into the drawing room in the evening. Up at twenty minutes to six, earlier than for a very long time. Read; About half past two out in the carriage, up & down. Very pretty the roads are here. It used to seem to me that the oolite[258] made pleasanter roads than any thing else. Read Mansfield park. I finished it. A very pretty novel – more incident than is usu-

[256] Perhaps Henry Braine, a Trinity student who did not graduate.

[257] In Dickens's novel *Nicholas Nickleby*, published serially in 1838–9.

[258] A sedimentary rock (limestone) much used in Bath.

ally the case with Miss Austen, & a less melancholy tone than Persuasion. It requires simplicity of taste to enjoy her writings. After a course of G. Sand's[259] they would be unbearably flat. Even the 'drum & trumpet' style of Ivanhoe[260] & its countless imitations, disinclines one to writings whose charm is in their truth & quietness.

17 September
Not up so early today. Read much as usual. A very rough day – my father better rather. Bathed. Could not get any walking. Penelope came back, with a cold. 'This comes of visiting' as the Smiths say on another occasion.[261] Miss Charlotte Affleck & Miss Becket are going to Boulogne. Crazy women, my mother calls them & deservedly, allowance being made for conversational hyperbole.

18 September
Again a bad day. I worked all the morning; about two went to Fector's Bank[262] for my father; there is there a subscription open for the family of the mate of one of the Packets[263] who died suddenly as it was coming into harbor on Sunday. I had no money or should have subscribed, & purpose yet to do so. Why I am not sure I can tell: I was on the Pier at that time; at any rate the subscription is not headed by a string of bishops deans & archdeacons, which to say truth is not a recommendation to me. In the carriage with my mother, Penelope being hors de combat. Not out in the evening.

19 September
Read, with great consumption of scribbling paper. As the time approaches 'I see a cat' and it is well I do, or the annoyance of the thing would affect me more than it does. A miserably wet day. Played backgammon with my father. At dinner, a letter came to him from Frank. It spoiled my dinner. He read it afterwards: I was touched by it, which I did not think I could have been – poor knave & fool. The letter is long – very confused & unintelligible, written from some outpost at the Cape in solitude and ill health.[264] I think my feelings are softening: for many a day I have not thought of him but as of the reckless destroyer of the peace of his poor father whose fate it seems to be, to be good to the unthankful & the evil.

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[259] George Sand: the pseudonym of the romantic novelist Amantine Lucile Aurore Dupin (1804–76).

[260] A novel by Walter Scott, from 1819.

[261] Ellis is referring to James and Horace Smith, authors of *Rejected Addresses* (1812), but the line seems to come from David Garrick's play *Bon Ton, or, High Life above Stairs* (1775), Act 2 Scene 1.

[262] A private bank established in Dover in 1700, also known as 'Dover Old Bank'; acquired by National Provincial Bank in 1841.

[263] A packet boat was used for regular mail services.

[264] Frank (Francis) Ellis was the younger of Ellis two brothers, born in 1812. Having left Cambridge (Magdalene College) without graduating, he had enlisted in the army, but had presumably resigned his commission. He died in London in August 1843.

20 September
Penelope had a letter from Mrs Cuthbert. Rosamond Orde was poor Frank's first love, then came the odious Cotthams, & then the Fords, whom I thought not less so. But – a fine day, at least fine after noon. I went down on the pier; the late bad weather has created a great bank of pebbles in the mouth of the harbor, which the means used to decrease seem insufficient. The current produced by damming the mouth except in the obstructed part is not very strong. The harbours on the coast are all in decay. At Hastings there is not a remnant of one; the cliffs at Winchilsea overhang green fields; Sandwich communicates with the sea by a shallow & dirty ditch – sic transit gloria mundi [thus passes worldly glory]. My father went out today. In the evening walked on the Parade.

21 September
Read, with half a headache. Bathed: a wet morning, but the afternoon fine enough to permit my father & me to walk towards Buckland. We went to the library. I met my mother alone in the carriage & got in; the motion tended to improve my headache with something more real. A lovely evening but chill. Looked at Paul & Virginie; immoral trash it seemed to me.[265]

22 September
Wet, so did not get to church. Read a sermon of Hare's damnatory:[266] These are fearful subjects, at last men treat them with fear & trembling. 'Dieu creant l'homme pour le damner ensuite' ['God made man to damn him'] contains in few words a great difficulty.

The afternoon cleared up. Walked on the pier & to the post office with my father. The air has got quite the autumnal feeling, & the sky is that of autumn. Years ago we used to think of going home, when autumn got in; now I am thinking of going to Cambridge. I recollect two or three years ago, at Ramsgate, feeling childlike if I may so say, & discovering the cause in the frosty & autumnal feeling & look of the air & sky.

23 September
A lovely day. Went out for a few minutes after breakfast. Read. Walked with my father under the cliffs along the line of the railway as far as Shakespeare's cliff where the tunnel is nearer home: there is a fort close upon the beach. They talk of making a tunnel under it – indeed it seems difficult to help doing so for an embankment against the sea would be a tremendous undertaking.

Worried myself about the lines of curvature on the Ellipsoid.

24 September
Another fine day. Read Geometry of three dimensions. We walked on the London road as far as the second turnpike. Saw a macaw loose in a garden. My natural benevolence made me ring the bell at a house to which the garden seemed attached.

[265] A novel by Jacques-Henri Bernardin de Saint-Pierre (1788) about two friends who fall in love with one another.

[266] Presumably one of the sermons published as *The Victory of Faith*. See diary entry for 10 February 1839.

I found first that the house & garden are distinct; 2dly that the bird is always at large; 3dly that the damsel who opened the door had but an indistinct idea of what 'macaw' meant.

Walked up & down the Parade in the evening: dark & sad. Another year is departing. 'Je vois mes rapides annees s'accumuler derriere moi'.[267]

25 September
A dull damp day. The Mr Godfrey, who called here some time ago, has three sons at school near Dover. These young gentlemen came to dine with us. They are nice boys, the youngest being just a little of a pickle, the eldest mild & thoughtful, an intensely abstracted reader & with that pensive air which a student often contracts: he is about twelve, the youngest nine. They were very joyous, tant soit peu bruyants [rather boisterous], the youngest at least; and their house is not large enough for noisy people. By the way, the power of moving about gently & sitting quiet is essential to being a good companion. I walked in the dark; they went off at nine.

26 September
Read. Calculus of finite differences. My father & I walked into the hills – or among the hills near the Castle – remote & tranquil. I love the rounded chalk hill: with its green recesses & healthy cheerful appearance, & yet more when the mists of autumn hang upon the summit; & the prevailing impression is that of loneliness. There are few scenes of which the character varies so much as that of a sheep walk in a chalk country. In a bright June morning, & in dusk November it is not at all the same thing. In the one the seclusion is cheerful, because it

[*page torn out*]

[…] without his coming in – so I gave it up. Gooden came in to tea.

8 October 1839
Read, both before breakfast & in the afternoon. Saw Peacock. Went to Mate's rooms; took a turn with him & we saw an amazing number of Scotch cattle – three hundred I should guess – defiling at the back of the colleges. Read again. Walked by myself by the river, & in the dusk with Mate & Gooden. Walton came to tea. I forgot to mention I went to his rooms yesterday after Hall. We played backgammon.

9 October
Read all the morning. Mate came to ask me to go on the river: I declined. He Gooden & I walked to Trumpington. Back to Hall. Wrote to my father looking in at Johnson's.[268] Read. Took tea by myself. To bed at ten.

[267] Alphonse de Lamartine's 'Neuvième méditation: Souvenir', in his *Méditations poétiques* of 1820.

[268] Elijah Johnson's bookshop in Trinity Street.

10 October
The morning as usual. I sent for Sudbury, feeling soso. He is out of town: his partner came, whom I do not like, & who besides knows nothing of my habitual health. Walked on the Hills road with Gooden – the evening precisely as yesterday.

11 October
I was rather heavy all the morning; walked faintly & with fatigue in the Trumpington road by myself. Took tea with Gooden, who leaves this tomorrow and persuaded me to breakfast before he started.

12 October
There were Walton Mate & Knox[269] at Gooden's. Knox has a little of the affectation of a 'petit litterateur', the character he seems to aim at; au reste a gentleman. Saw Gooden off; walked to Grantchester with Mate & who gave me tea. I felt better today. Left Mate about nine & at tea to bed.

13 October
To morning chapel. Mate breakfasted with me. Read. Walton & Gregory called to make me walk with them which I did towards Madingly.[270] Gregory came back last night; he is not well; seems however not cut up by the fellowship failure.[271] Walton takes the journal for a year.[272] I suppose he is settled here for some time; he will hardly leave a better liked man behind him. I do not enjoy his humour much, but he is a kindly hearted man. Tea tete a tete with Gregory.

14 October
Read, Geometry of three dimensions. A fine day: walked by myself on the Trumpington road. After Hal met the Challises, & walked a short way towards them home with them. To my rooms, & to chapel. Mate took tea. Wrote a note to Hopkins to remind him of my existence.

15 October
I wrote last night to Hopkins & had an answer today, appointing two for me to call. I went & made some arrangements: a damp dull day. Mate not very well; I took a short walk with him. Met J.M. Heath – while speaking to him, I was addressed by Peacock, who asked about my arrangements with Hopkins. Whewell was with him, so I was surrounded by a galaxy of great men. Mate came to me in the evening; we set making paper boats & talking nonsense till eleven. I heard from Fanny today:– they pass through town on Thursday.

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[269] Alexander Knox (1818–1891), Trinity 1837; B.A. 1844; M.A. 1847.

[270] Madingley: a village west of Cambridge.

[271] He gained a Fellowship in 1840.

[272] The *Cambridge Mathematical Journal*.

16 October
Went to Hopkins & took a paper. Came away about two. Called on Gregory. We went out together & met Walton with whom we walked Madingleywards, & in our garden. I took coffee at Waltons after chapel & played backgammon with him; & a man there, Coneybeare of Peter House, a boor rather.[273] The games were enlivened by Walton's facetiae, & Gregory.

[*pages torn out*]

30 October
Somewhat better today. I got a chill in chapel on Sunday morning. Read some Statics. Walked with Lingham. He wrote to his brother about this odd business. He saw the lady, with whom he was much struck, & obtained her engagement not to molest him for six months. More he could not gain from her, although he used for five hours all manner of persuasion. Miss Martineau wonders these things do not occur oftener.

31 October
Went to Hopkins's. Went to Gooden's when I returned, stayed there few minutes. A wet afternoon. Played battledore & shuttlecock at Gregory's: five at once. Ridge Hume Gregory Walton & myself.[274] I had been fencing with Cockburn & was soon tired.

1 November 1839
A College examination;– afterwards walked with Jenkins on Parker's Piece.[275] Cold and windy.

Took wine at Whewell's and stayed late; had a good deal of talk with him.

2 November
Read quietly all the morning. A wet day, so I went and played battledore at Gregory's; met Lingham, who said he hoped I would come and fence with him. Where I met him, was at B. Maitland's, where were Broderick Jay, who wears a wig. Simpkinson & two or three freshmen.[276]

3 November
Taylor came to me last night with Chaucer, read a good deal then talked on with that warmth of feeling & geniality which would redeem faults ten times as great.

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[273] John Conybeare (1819–1884), Trinity 1838; migrated to Peterhouse 1839; B.A. 1842; migrated to Downing 1845.

[274] George Ridge, Trinity 1836; B.A. 1840. Joseph Hume, Trinity 1836; B.A. 1840 (26W), son of Joseph Hume MP.

[275] An expanse of grass in Cambridge.

[276] Broderick Jay not found. 'Simpkinson' is probably John Nassau Simpkinson (Trinity 1835), B.A. 1839 (10th Classic); M.A. 1842.

We went to St Mary's together but as Whewell preached it was so full that we could not get in. So with Cockburn we went as far as Trumpington & returning sat in my rooms till hall.

Taylor carried me to Knox's in the evening to hear Pearson. He was not in sorts; still I enjoyed the music and the quiet society very much. Walton came in. Taylor followed me down the stairs & stayed late. I cannot help enjoying his society very much.

4 November
Went to Hopkins. After returning called on Gregory, after meeting him in the court, & left a note at Salter's, putting him off, on account of the Union tonight. Called at Walton's also. Walked with Gregory & Birkbeck his pupil to Trumpington.[277]

Saw a remarkable rainbow: the colours of interference within the primary now singularly distinct. At the Union. After a desultory conversation in which Hudson Bagalley Chambers of Clare, the last two 'small college men', I & Stokes, the last complimenting me, the president affirmed his decision as to the illegality of the last election & the candidates were proposed, Craufurd by me. On a show of hands we were two to one.[278]

5 November
A college examination; walked with Jenkins; talked of images in the memory, how they rise up in times of depression & weariness, as if from moral exhaustion.

At Mate's after hall. Cockburn Jenkins Gooden & a freshman Dickenson son of a late member for Somerset there.[279]

Our election[280] went on magnificently, and the poll closed with 95 majority, ten or twelve being the outside expected. Gooden became a member to vote. I proposed him.

6 November
Read all the morning. Met Gregory in the court, walked with him to Grantchester. He wants sentiment, has no mixture of sentiment or superstition: at least it does not come to the surface. Walton has this and is so far more interesting.

[277] John Birkbeck (1817–1890), entered Trinity College in 1837 but did not graduate.

[278] Hudson is probably Thomas Hudson, St John's 1832; B.A. 1836. Bagalley is probably Richard Baggallay, Caius 1834; B.A. 1839 (14W), Fellow 1842–7. Chambers is probably Thomas Chambers, Clare 1837; L.L.B. (First Class Civil Law 1839–40) 1846. George Gabriel Stokes (1819–1903), Pembroke 1837; B.A. 1841 (SW and First Smith's Prizeman); Fellow, 1841–57 and 1869–1902; Lucasian Professor of Mathematics, 1849–1903. Edward Henry John Craufurd (1816–1887), Trinity 1837; B.A. 1841; President of the Union Society, 1839. 'Small college men' was usually applied to members of any college but the two largest, Trinity and St John's.

[279] Edmund Dickinson (1821–1896), Trinity 1838; B.A. 1843.

[280] Of members of the Cambridge Union.

The evening as usual. My new reader Holmes of Catherine Hall came to me for the first time last night.[281]

7 November
Went to Hopkins. After coming back, looked in on Mate; read the 'Pleasures of memory' in his rooms. Called on Walton, persuaded him to take a walk as far as the first milestone on the Trumpington road.

Gregory came to my rooms in the evening.

8 November
A college examination. Came away at two. Mate came to meet me, at Gregory's, walked with him & Birkbeck towards Grantchester. Mate took tea with me. Read as usual. It is very hard work.

9 November
Read; called on Cockburn; on the stairs met Taylor, with whom I walked on the Trumpington road. He asked me to go to his rooms in the evening, which I did & found Walton Hume Cockburn, the first & last talking metaphysics. The second not the less a charlatan for being noisy & boisterous. I believe that writing some days later I have transposed these two days: the 9th I walked with Gregory and Birkbeck, the 8th with Taylor. Returning we met a gentleman and lady, strangers apparently: very striking the latter was, that air of voluptuous hauteur that some people admire greatly. It is not my taste. After hall found a note from Fanny, & a card from Mr Paul the clergyman of Finedon. They – he & Miss N. Paul – were passing through here from Dalham. Fanny very pressing that I should see her beauty. So I being curious to find out if they were the people we had met, went to the Hoop – a strong measure – but they had gone out to dinner.

10 November
To chapel. In a letter from my father I find Morris, whom I remember & who was one of the Walmer world, a Johnian who was eternally plucked, has caused the death of Miss Gregory, of the same world to whom he was engaged.[282] He was to get a living, if he could get a degree, & this was a sine quâ non to their marriage. But he wrote in despair to her, and she drowned herself. A thing which a man never could forget, 'a fatal remembrance'.[283]

Heard Melville at St Mary's; went with Taylor. A popular preacher, a being I cannot bear.

Gregory Mate Walton Bouverie[284] took coffee with [me] after chapel. I asked B. Maitland.

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[281] Henry Holmes, St Catherine's 1833; B.A. 1837 (18W).

[282] The only possible Morris, Morice or Maurice is William Morris (St John's 1839), but his admission date seems to be too late.

[283] Thomas Moore, 'The wintry smile of sorrow'.

[284] Philip Bouverie (Trinity 1838), B.A. 1843. Cf. 5 February 1840.

11 November
Went to Hopkins. Returning, called on Walton, went with him to Lingham's – we walked on the Madingley road. After returning we saw Walton off. He started on the Sandhurst[285] appointment question, singularly habited in a straw hat and brown cloak: a dimidiatus Robinson Crusoe.[286] After chapel Jenkins & Knox took tea with me, the latter apparently an uneasy-tempered man, which I believe is his character.

12 November
A college examination would have taken place today, but was on account of the oratorio put off. Read all the [*pages missing*]

[15 November]
[…] adopted all the suggestions I had made, which made me regret that I did not offer to write the letter – partly 'for the fun of it' but more because I should have written a better letter for the purpose. That the English of some parts was questionable was not so bad a fault, as that it was all half preachment & half timidity; a few short & plain sentences without fear & full of meaning was what a sensible man would have written. The most amusing part was his laudation of his own unspotted character; this & the commentary his conversation afforded with the odd use of the phrase 'forfeiting honour' were perfectly womanish.

16 November
Went to Hopkins in the wet, with a Macintosh[287] of Mate's. The afternoon was not so bad as the morning, when it rained incessantly. Called on Lingham and took a turn with Jenkins. [I] proposed him at the Union, whence I took the life of Ld. E. Fitzgerald, a book I used to read in Johnson's shop[288] last year as it never occurred to me it might be at the Union. It delights me, as much as ever; it may in some degree be from associations, independent of its merit.

17 November
I did not go to chapel. Read till twelve. Gregory came to walk me out, the day being very tempting. We tried the Madingley road, for which he seems to have a penchant. Coming back, he spoke of Taylor as a sneerer. Nothing can be further from his character; but Gregory has very little of the sort of sensibility which alone makes a man a judge of men's character from the trivial acts which one sees in everyday intercourse. It is for this reason, that women often judge so accurately of temper & disposition: to understand a man's understanding requires one commensurate to his.

At Taylor's and Knox's in the evening. Jenkins singing and playing – it was very pleasant.

[285] The Royal Military College, Sandhurst.

[286] 'Dimidiatus' = half-size.

[287] A waterproof coat invented in 1822 by Charles Macintosh of Glasgow.

[288] See diary entry for 9 October 1839.

18 November
To Hopkins. On returning called on Mate and stayed some little time with him. An uncomfortable day. Taylor far from well. I went out later and took a short turn. Jenkins took tea with me. I tried to explain to him the parallelogram of forces.

19 November
A college examination. I had a headache; after getting away I went to Walton's and got him to take a short walk. Gregory was with us. Another dark damp day – not very strange in November. The evening as usual, by myself.

20 November
Read all the morning. A letter from my father talking of coming down. Walked with Gregory to Trumpington; he tasked me with 'keeping my opinions snug'[289] in jest, yet seriously. Apropos I think to my trying to moderate the way he was talking before Lingham of the Irish rebellion. I do not want people to come to me with Baa Baa black sheep, but if Gregory believes me either ashamed of or unwilling to defend my views, he is mistaken. If he thinks I would like this or that opinion, to win the good opinion of this fool or that, he is yet more mistaken.

21 November
To Hopkins. Ordered a cloak. Mate not quite well. Saw Jenkins with him. Went out, called at Cockburn's. Jebb came in, sat there till hall time. In a shooting jacket of Cockburn's, drying my coat by the fire. My dress seemed to perplex Jebb very much.

I took wine at Jenkins's yesterday. Gooden Mate Cockburn Murray[290] – a man who was captain of the poll once upon a time &c. Gooden as usual setting Cockburn right à tort et à travers.[291]

22 November
A college examination. But I did [*pages missing*]

[2 December 1839]
[…] all the invitations I have had since I have been here. I would have given something to have been able to go to Barton last year – and to say truth turned away from every Bury coach I met for some time afterwards. The visit might one would think to have been very pleasant, whether or not. I felt and still feel the real pleasure of receiving kindness.

To Hopkins. Walked with Lingham. An excellent foolometer[292] he would make. An excellent fellow, pity one has so often to add, a noodle.

Taylor took coffee with me.

[289] Keeping quiet about them.

[290] Perhaps William Murray (Trinity 1835), B.A. 1839, M.A. 1842.

[291] Indiscriminately.

[292] Someone whose foolishness makes him a standard for measuring stupidity (*OED* 1837).

3 December
After a college examination, I went to Gregory, who proposed a walk, we went along the Trumpington road. Not so bad a day as yesterday. Gregory told me of Cowie's[293] drunken speech at the Scotch dinner Saturday.[294] I had heard of it from Taylor. He proposed à tort et à travers,[295] the health of the Editor of the C[ambridge] M[athematical] Journal – 'a thing I write in myself sometimes', a fact by the way not before known.[296] This fact though Cockburn is answerable for.

At Taylor's after hall. Holmes of Emmanuel there, a friend of Pearson's, a man who burst into tears at some music Pearson played (once).[297] A sensualist obviously, which is not at all incompatible with the relish for music.

4 December
Read, all the forenoon. An idea occurred to me yesterday evening, which I put down – & the result of it, is a demonstration that Lagrange's famous propositions with respect to the stabilities of the eccentricities & inclinations, are only an approximation to a proposition accurately true & known long before, viz, the conservation of areas. So far then as this opens the stability of the system so far is it opened, but the researches of Lagrange introduce no fresh principles, and show only how much symbols will confuse principles.

With Gregory on the Madingley road, looking for Walton. Gregory likened himself to Miss Edgeworth's Forester, at least while he was a hobeldehoy. True enough I should think.[298]

Looked in on Gooden. He dining in his rooms, with that 'secret of a man', as Taylor well called him, sitting close beside him.

5 December
An examination at Hopkins's. Coming back, I went to Gregory to tell him I had added true understanding to the eccentricities, in the proof given of their stability. He proposed a walk at two. I had a note from Lingham, who is ill in bed requesting me to sit to Nightingale[299] at half past one, which I did. A three quarter face, so not finished at one sitting. To Trumpington with Gregory. Coming back, we were joined by Mr Brown, a Scotch Episcopalian, & now select preacher – a for-

[293] Benjamin Cowie (1816–1900), St John's 1833; B.A. 1839 (SW and Second Smith's Prizeman); Fellow, 1839–43; Professor of Geometry at Gresham College, 1855.

[294] A Scottish Society was founded in Trinity in the early-1830s.

[295] Without rhyme or reason.

[296] There is no record of Cowie's having published in the *Cambridge Mathematical Journal*.

[297] William San(d)croft Holmes (1815–1849), Emmanuel 1834; B.A. 1839; M.A. 1842.

[298] Forester is the eponymous protagonist of one of Maria Edgeworth's *Moral Tales* (1836); he is good-hearted but introverted and awkward in society.

[299] W.H. Nightingale, an artist active 1836–40.

ward, free and easy, smug, well fed man. Hopkins came to me in the evening. Talked of my degree, said precisely what he said to me last year.[300] It upset me then; now I am hardened against any annoyance of that kind.

6 December
A college examination. After it, took a short walk – a miserable day – after it, went to Gregory's to play battledore & shuttlecock but found it too dark, and left him. Walton & Hodgson of Peterhouse straining their eyes about it. I had expected Hopkins again this evening, but he did not come. Tea at Mate's. Jebb came in.

7 December
To Atkinson about my papers. Also to Hopkins, who told me to come in the evening, and to Maitland's. Read languidly. Gave Taylor 'Consolations in Travel'.[301] Cutting it open with a breakfast knife I in some awkward flourish cut my ears with it. I was greatly diverted with the result, which was the more amusing as I cut my hand twice during the day, with the same knife. The consequence was that returning to my rooms after I had started to walk by myself, to wash the wetness from my face; I was called on by Gregory, & we walked to Trumpington. This is Saturday, and I have been with him every day this week. I don't like sworn brotherhood, more especially when the man does not in all points seem congenial to me.

Took coffee en famille at Hopkins's. An old lady there sa belle mère.[302] I was there on business, & the coffee was surplusage.

8 December
To chapel. Read, but not well. Walked out with Taylor. We called at Cockburn's. He joined us. We went towards Cherryhinton: a miserable day. Cockburn Jebb. Taylor took coffee with me. We sat talking till eleven; cut up Gooden. I do not know if he deserves it: certainly he provokes it by a perpetual tendency to superciliousness, & by occasional rudeness. No man talks oftener of 'gentlemanly', yet he is always rather a cockney than a gentleman, and frequently is absolutely illiberal by way of being facetious. He is in great form just now: 'his dreams', to quote Joyce's last letter, 'are so golden at the end of a trial'. Somehow he was far better when the tide was running against him. My motto for his coterie is not very bad, 'Et his dantem iura Catonem'.[303]

[300] That Ellis would be Senior Wrangler.

[301] Humphry Davy, *Consolations in Travel, or, The Last Days of a Philosopher* (London, 1830).

[302] Mother in law.

[303] Virgil, *Aeneid* 8.670: in the underworld, the righteous are in a place apart, with the austere moralist Cato giving them laws.

9 December
Returning from Hopkins early I read an hour, and then went to Cockburn's. From thence to Jebb's and the three went to see the fat one, or large one rather. It comes from America, English bread: Durham Hereford & Sussex. Took a turn on the Hills road. Then Cockburn left us, and we turned west again with Taylor on the Trumpington road.

A very cold damp day.

10 December
A college examination. Not till three. Went to see Lingham, & was let in. The room dark, he in bed, very much broken: his complaint, inflammation of the lungs, and I believe he has broken a blood vessel. His dream, the clock with 21 divisions, & the finger of the hands which held it pointing to 21, might well be fulfilled; & what is the consolation, he is convinced that the time of the presage is passed away.

A pretty clear day. Returned to Lingham's after hall, but did not stay.

11 December
Read at home till two. Walked with Gregory on the Trumpington road. He and I get on wonderfully well. I should like to see him with manners.

To Craufurds after hall. There were Gregory Hume Jebb Taylor Birkbeck &c. Went to chapel, and after it to Linghams. He goes away tomorrow. Craufurd came to me in the evening, to ask my signature to a petition to himself as president,[304] to discontinue Smith's the proctor's 'portfolio' – said proctor being extremely unpopular. I gave him my name but thought the preventing in very bad taste. Hume was busy arranging for the same object.[305]

12 December
[*pages missing*]

[17 December]
[…] any social relation: a man who drinks tea out of the saucer and balances it on three fingers.

18 December
Went to Hopkins, but did not stay. I am to look over some subjects & then return. Found I had a cold, & was otherwise not well. Gregory asked me to walk. I agreed, but went afterwards to excuse myself; played battledore & shuttlecock with him. Dined in my rooms & saw Sudbury.

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[304] Of the Union.

[305] John Smith, Fellow of Caius 1828–49, was Senior Proctor 1839–40, and was extremely unpopular with undergraduates. See the entry for this day in *Romilly's Diary 1832–1842*, 184: 'the gownsmen mobbed the Senior Proctor and […] battered Caius Gate with a large beam & broke through it'. The portfolio was a collection of short pieces and illustrations Smith had edited: J.J. Smith, *A Cambridge Portfolio. Volume I* (London, 1840). No more appeared.

19 December
Stayed in all day; I put an aegrotat on;[306] read as well as I could. I read a good deal of Mrs Hemans. After all a mannerist, and the gorgeousness of which her admirers talk wearies me. I want simplicity. But there is a great deal very sweet, & the moral effect of the whole is good & pure.

Gregory & Mate sate with me all the afternoon. Walton looked in in the evening – & Gooden.

20 December
Rather better today; my cold is gone, but I am not right. Headache. Went out for a few minutes and met Knox, who had asked me to walk, but I had declined. I do not know if it is the kind of slight that he would take amiss – in reality it was none, for I was only going to be out for five minutes.

A good deal of headache in the evening.

21 December
A lovely day. A letter from Harmer, telling me of his marriage.[307] Not to Miss Robertson but to the daughter of a physician at Southampton; he seems very happy. I do not understand it. 'Devotedly attached to his mother & sisters',[308] he has seen the last of them die these last few months, attached as he gave one to understand he was to his cousin. He is as full of his new love, as if nothing had occurred to make him a sad hearted man. The ardour & the fickleness are both out of my way. It is for men like him that the institution of marriage is of use. A profligate man is not bound by it at all: for myself, I believe I should live contentedly all the days of my life with a woman I set out with loving, but without any obligation whatever. But gusty inflammable unstable men like Harmer, require some restraint.

Went towards Trumpington with Mate. Bought the Essays of Elia – a very pleasant book.[309]

22 December
Read – a dark dull day. Sat to Nightingale in Taylor's rooms, for Lingham. The likeness is to be a ¾ times face. There never was anything so remarkable as the result; the fact is he can do nothing but profiles, & then not well.[310]

Hot,– so I dined in my rooms, & was obliged to send to Heath for an order, my aegrotat[311] having expired & the kitchen shut on Sundays.

Gregory sat with me till chapel time.

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[306] An exemption note based on illness; it usually referred to being excused from an examination.

[307] Perhaps Henry Marven Harmer (Queens' 1839), moved to Trinity College, Dublin 1840.

[308] Probably from Timothy East, "On theatrical amusements," in *The Evangelical Rambler*. Volume III. Part I. (Dublin, 1825).

[309] Charles Lamb, *The Essays of Elia* (Paris, 1835).'Elia' was Lamb's pseudonym, from 'L[amb]'.

[310] W. H. Nightingale, active 1836–40; four portraits are in the National Portrait Gallary, two in the Victoria and Albert Museum. This portrait of Ellis is not listed in his *ODNB* entry.

[311] See note 306.

23 December
Went to Hopkins, but found he is not in Cambridge. Read in my own rooms, I thought it was no use staying at Hopkins's when the genius loci was gone. Called at Gregory's and Walton's; went to the Union and returned to my den, it being a very damp afternoon; walked up and down the room. Dined in hall – Gooden voluble in nauseam, about this man's place & that. Walton took coffee with me. Gregory came in but did not stay long.

24 December
Whewell in the morning. Saw Sudbury. Read; stayed chiefly in my rooms. Took some broth. Taylor came in just before I ordered it, & had some with me. Mentioned Knox's saying to P (as his friends call him) that he had taken so strong a dislike to him, that he was ready to quarrel with everything he said or did. A woman to feel so, a simpleton to confess the feeling. I half suspected something of the kind. There is no dislike for openly speaking in this: it is small natured, which is a different thing. It argues rather a diseased & ill-governed imagination than malignity. But a man, who has a rational regard either for his own peace, or for the dignity of his character would resolutely put the feeling away.

Better in the evening.

25 December
Went to chapel. John Brown preached & well, as far as I could hear him.
After chapel, walked with Mate & Cockburn; they took me to Chesterton, where I had never been – rather a pretty village, but it lies very low, and has a malaria aspect. After coming back, Mate went to the Union & Cockburn and I took a turn on the Hills road. Hall at half past three; Cockburn & Jebb dined at our table, so the party was once again as it used to be in the first year before I knew any of them. It is a weary while since those days. Now that all is over it makes me mournful to reflect on them: one seems to have lived two or three lives in the last three years. Now when I look back to my last six months in Bath & recollect how intensely present they once were, I feel that life is in reality long if measured by the ebb & flow of impressions.

Mate & Gooden took tea with me. The latter is in an uncomfortable frame of mind.

26 December
A miserably wet day. Went to Hopkins, found he had not yet returned. Read; called at Walton's, and proposed a walk. He came to me, but as it was wet, we went to Gregory's and played battledore & shuttlecock: Ld Napier there. Played also backgammon with Walton.

Gregory had an Xmas dinner today. I was asked, but went in the evening; an ill-assorted & merry party. There were Smith Law Hume Birkbeck Strettell[312] Napier Hodgson of Peterhouse, & it may be sure more. To Taylors afterwards.

27 December
Read all the morning but feebly; went to the Union, & looked at the papers. To Walton's, Gooden there. He & Taylor have synchronised in making free with offerings to Walton the one Wordsworth & the other Shelley's prose works. Walked with Walton a little way in the Trumpington road. He is a man of most extreme opinions: at least has great capabilities for receiving any wild view, so it be only wild enough.

Gregory sat with me after hall, & Mate & Gooden came in.

28 December
A clear cold day. Tylor proposed to me to join him & Cockburn in an early walk,– which I did, & we went towards Grantchester. Home about twenty minutes to two. Read till hall. At Mate's afterwards – I am surprised at myself for going, but did not exactly know how to refuse. Hell, like all parties. Yet I stayed late.

29 December
Read in the morning. To Grantchester with Taylor – coming back met & were joined by Napier & Gregory. His lordship[313] asked me by a note received at half past nine to breakfast at half past ten. I take for granted he did not intend to treat me casually. We talked as we walked back of Pompey & Caesar, aristocrats & demagogues.

At Taylor's after hall. Walton the only guest. Jebb & Cockburn dropped in.

30 December
Read till two. Gregory came to make me walk: Walton and Mayor were of the party, but walked by themselves, to Grantchester. A very cold day. Back just in time for hall.

Mate took tea with me. Read &c & went to bed without seeing anyone else.

31 December
Read, desultorily. Cockburn & Taylor called; at two they returned & we went out to walk. We went to the top of the Castle hill & then dined below. I had never been there. Down the bank we went, & after going across country for some time came out on the dirtiest road I ever saw. I got very tired & Taylor proposed to carry me through a very muddy bit. Up I sprang – off blew my hat into a pond. There was something very absurd about the scene. After returning & purification at home we took a short walk on the London road.

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[312] Edmund Law (Trinity 1835), BA 1840. Two brothers, Alfred and Henry Strettell, Trinity 1836; B.A. 1841. 'Hodgson' is probably Joseph Lowther Hodgson (1818–1861), Peterhouse 1836; B.A. 1840; M.A. 1844.

[313] Lord (Francis) Napier, entered Trinity in 1837 but did not graduate.

While I have been writing the bells have begun to ring in 1840. A senseless triumphing over the invincible enemy. I must go to bed for I have been busy almost ever since five o' clock.

1839 did to me what all years do: taught me some painful lessons, destroyed some kind feelings, lessened the dying feeling of innocence. But the sense of duty & the readiness to sacrifice to it have not, I believe I may say diminished.

1840

1 January
Went to Hopkins's & stayed some time with him. To Peacock's; he had expressed a wish to see me, spoke of the tripos, 'a song of degrees'.[314] I find he still expects me to be at the top – which is impossible. Felt idle; read in Taylor's rooms Sheridan Knowles's plays.[315] Went to Cockburn's, found him and Taylor setting out for a short walk. I joined them, & the walk was protracted and to me made fatiguing. We went to Histon where I had never been. A pretty village but close on the flats, and to judge by the churchyard not healthy.

2 January
Not very well today; the weather is oppressively mild. After reading as well as I could I went out with Mate. He had an engagement at three, & I went to the Union. Read the magazines, & brought home a volume of Crabbe's tales.[316] In the evening I could not do anything, and went to Taylor's for a light book. Walton came to my rooms, & we came to my rooms and played backgammon. Afterwards I read Undine which Taylor lent me.[317] It is a charming book – I read on and finished it – & went to bed, full of the impression. It is a fine conception, & the execution I should say admirable – nothing can be more striking than Undine's mournfulness when the shadow of the soul is cast upon her – nor more touching than her disappearance & the closing scene of the knight's death.

3 January
Better; down late. Taylor came in before I had breakfasted, and I went to breakfast with him. Very idle – unfit for work – read Undine again & other things. Went out by myself, met Walton who turned with me. Gregory in hall asked if he should find me in my rooms. I got some messages &c, and he & Walton came in. Gregory leaves this[318] tomorrow, and it will be some time before 'we three shall meet again' … so

[314] Ellis puns on the titles of some of the Psalms, which were 'graduals', designed to be sung by those ascending the steps on the Temple Mount in Jerusalem.

[315] James Sheridan Knowles (1784–1862); his best-known play was *The Hunchback* (1832).

[316] Rev. George Crabbe (1754–1832), East Anglian poet. His sets of tales were published in vols. 4 and 5 of his *Poetical Works*, in 8 vols. (London,1834).

[317] Friedrich de la Motte-Fouqué, *Undine: Eine Erzählung* (1777). An English translation appeared in 1818. Undine was a water nymph who fell in love with a mortal man; they married and had a child, but he was unfaithful to her.

[318] That is, this town/place.

it is, 'our days are broken into parts'.[319] Very long will it be before some other three of which I have been one will be formed again;– never until all that gave them value is departed.

Backgammon with Walton.

4 January
To Hopkins's. Paid fees at the Registrar [sic] Romilly's[320] & at the junior proctor's. The whole amount is £7 14s 6d, included the father of the college whom I paid yesterday. At the proctor's I made a declaration that I hold no living &c, & have not £24 odd fixed income, either in right of my wife or my own right.[321] I was prepared for a total abnegation of all property.

I wrote to my father some days since about my movements, saying I should prefer being at Dalham to home between the examination and degree. Apparently this went to Dalham, and I had a note from Fanny for Sir Robert today. I named Tuesday week; I am very glad of the arrangement, as in all respects it is the best that could be made.

A wet day – a short walk with Walton & tea at Mate's.

5 January
To Peacock about my seat in the examination; he kind & inclined to be useful.[322] To Taylor's; read till half past two, walked with Cockburn & Walton. We met the Litchfields, I amused Cockburn with an anecdote touching them.

To chapel. John Wordsworth's grave open by Newton's statue.[323] It gave me a turn: the funeral is tonight or tomorrow. Holmes called sans rime ni raison. Mate had tea.

Tomorrow the examination begins. I am very cool, yet shall play a losing game. However, 'Medea superest'![324]

6 January
Breakfasted at Taylor's, bringing my tea &c. Cockburn was expected, but came late. We went in at nine: there is an ugly practice of fining a shilling a minute.[325]

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[319] 'When shall we three meet again /in thunder, lightning or in rain?', ask the three witches in *Macbeth*, Act 1 Scene 1. Richard Monckton Milnes, 'Mutability': 'Our days are broken into parts /And every fragment has a tale /of the abandonment of hearts'

[320] Joseph Romilly (1791–1864) – Trinity 1810; B.A. 1813 (4W); Fellow 1815 – was the Registrary (originally 'registrarius'), the chief executive officer of the University.

[321] That is, he was eligible to receive fellowship income.

[322] Ellis asked to be examined in a separate room; the request was granted.

[323] John Wordsworth, eldest son of the Master of Trinity and a Fellow since 1830, had died on 31 December.

[324] Medea's response ('Medea remains') to a servant's gloomy prognostications in Seneca's tragedy *Medea*, lines 164–5.

[325] The fines were for late attendance in college examinations.

First paper till half past eleven; after coming out to dissipate ourselves, Taylor Mate Cockburn & I took a walk by the river, the first reading his hydrostatics as we went along. At one until four, cleared the papers – Taylor Cockburn & I walked till near five, they came and dined in my rooms. Walton Mate Gooden came in, in evening.

7 January
Breakfast as yesterday. Took a walk with Mate & Cockburn towards Cherryhinton[326] between two papers, & after a disagreeable problem paper with Cockburn to the parallelogram.[327] Dinner at Taylor's. Saw Walton Cockburn there. Mate came in. Backgammon with Walton – felt done up.

8 January
Between the papers Mate & I walked on the London road – & after a most 'disgusting' problem paper of Gaskin's, Taylor, Cockburn & I took a turn towards Barton. There was an *eranos* [328] in my rooms of us three, Cockburn ordering dessert. Gooden came in. Challis came to see me, immediately after the second paper.

9 January
A day of rest. Wrote to my father, called on Walton, & walked with him. We went on on [sic] to Byron's pool[329], so to Grantchester: the fields & plantations we traversed filled me with melancholy. The weather was for the first time since Saturday, in unison with all blue devils. I felt unwell, quite jaded & depressed.

10 January
Walton left us today – I regret him. After the morning papers Hopkins came to see me. Spoke advantageously of what I had effected &c. A turn on the Hill's [sic] road brought it to one after the second paper. Dined at Cockburn's; Gooden Jebb & Taylor. A scrambling dinner – lucky we had anything to eat.

A magic lantern was proposed & ordered. Before it came, Sheehan & that mooncalf Strettel came in. The former sang villainous ill, one of the Irish melodies; between this a general noisiness, & Taylor's strong propensity to buffoonery, I could not stay, but went to Knox's and played backgammon with him; beat him 13 to 4.

11 January
With Mate Cockburn Taylor to see Uranie, a head of Raphael's.[330] Exquisitely beautiful – the nose & mouth perfect. I am not sure I like the eyes so well. After all it is miserable to criticize a beautiful face feature by feature.

After four, took a turn by myself, and dined alone in my rooms. So ends the fifth day.

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[326] A village 3 miles south-east of Cambridge, now a suburb and usually spelled Cherry Hinton.

[327] A favourite walking route across the river from Trinity. It gave its name to Parallelogram Road, which was renamed Grange Road in 1879.

[328] Discussion meeting; originally, in Homer, a dinner to which each participant contributed a share.

[329] A pool next to the River Cam near Grantchester, so called because Byron was supposed to have swum there. The area is now a nature reserve.

[330] A sculpted head by Raphael of Urania, the muse of astronomy.

12 January
Being Sunday – was a day of rest. Read idly.

[*pages missing*]

[14 January]
[…] had come to offer congratulations of all kinds. Hopkins said I was considered a senior wrangler among senior wranglers. Smith[331] that I had it down & beat Goodwin the second by 300 & odd marks.

After hall wrote to Fanny & to my father, & sent them both lists. At Taylor's – gave Mate coffee. He is 14th & disappointed.

Heard from Joyce at Bath. He is I think in a bad way. They are going to reside in Lansdown Crescent.

Burcham came to me to congratulate in the evening. Peacock sent for me, he said I should get a fellowship the first time of sitting,[332] which tends to make it worth while to try.

15 January
At a quarter past nine to the Combination Room, where Burcham as father of the college gave breakfast to the questionists. A great many men there. I was introduced to Field, our fellow. A very good breakfast & I sat between Burcham and Taylor. Thorpe[333] [*sic*] came in, 'I had as soon see the devil' said Burcham then the venerable disappeared. At ten to the Senate House. Put on bands and hood,[334] Hume sedulously superintending. Then mingled in the crowd: congratulated and was congratulated. Mrs Challis sent for me, & I went & spoke to her. Whewell came up & after congratulations hinted at the impropriety of being where I was; for which I relief I felt obliged. I returned to the bar where my friends were. Hopkins sent me down to the platform as I was to be marched up all the way. When all was ready, he and the other esquire bedell made a lane with their maces, and Burcham led me up. Instantly, my good friends of Trinity & elsewhere, two or three hundred men, began cheering most vehemently, and I reached the Vice's chair surrounded by waving handkerchiefs & most head rending shouts. Burcham nervous; I felt his hand tremble as he pronounced the customary words 'vobis praesento hunc iuvenem' ['I present this youth to you']. Then I took the

[331] Archibald Smith was one of the Tripos Examiners for 1840.

[332] Graduates had three chances of success in the annual Fellowship examinations; those sitting for the third time were to some extent favoured.

[333] Thomas Thorp (1797–1877), Archdeacon of Bristol 1836–1873 educated at Trinity College, Cambridge, which he entered in 1815, graduating B.A. in 1819 (8W). He was Assistant Tutor 1822–34; Junior Dean 1829–32; Tutor, 1833–44; Vice-Master 1843–4.

[334] Formal academic costume.

oaths of allegiance and supremacy and knelt before the Vice,[335] who pattered over the 'Auctoritate mihi &c' and shaking hands wished me joy. I turned back, & walked slowly & stiffly down the Senate House. More cheering. Hume met me, & led me to the open space just at the bottom – made me sit down, & said I was pale, which I suppose was true, as I did not feel the excitement the less for showing but little symptom of it. Up came some gyp, with a bottle of salts, which I declined at first, but was bound in gallantry to take when I found a young woman had sent it to me from the crowd.

There was a great deal of cheering and groaning à tant propos, during the three quarters of an hour I stayed afterwards; Roberts Joh.,[336] Heath, Walton just returned, and Perry.

The afternoon became wet just as Gooden Mate & I were going to walk. Took some glasses of Sauternes at Gooden's. Went to the Union with Mate, got some books there, played [*page missing*]

25 January
We left Cambridge at ten, without seeing anyone I knew. Walton did not come to take leave. I imagine he has a morbid feeling with reference to taking leave &c. Got home a little after four. Found things here much as usual. Played a little backgammon.

A lovely day but very cold.

26 January
[W]et morning, so I did not go to church. Read a little. There are many good books belonging to the house we are in but of course I was inclined to be desultory. Sam Barrow called; he is we will not say what but very unlike my Cambridge friends in point of ability. He repeated what he had said before about 'blushing for shame' [*sic*] when Mrs Napier had enquired for me.[337]

I did not go out.

27 January
Fanny was expected Wednesday, but there was a letter today, to say Sir Robert[338] [w]ished to detain them for two days more, to which with not the best will in the world, she agreed.

I called on S Barrow with my father & saw him. We saw also Baillie who looks broken, and very fat. Dined at the Temple. Sat beside Turner of Trinity, a friend of Cockburn and of Joyce's. Dull man, as I always thought him.[339]

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[335] Vice-Chancellor.

[336] Perhaps William Roberts (St John's 1835).

[337] Caroline Napier, wife of Colonel William Napier.

[338] Sir Robert Affleck, her father-in-law.

[339] Perhaps Isaac Biass Turner (Trinity 1837), BA 1841, though he was surely too junior to have the offers mentioned at 22 April 1840.

28 January
Wrote to Crowfoot, and to another of my congratulations. Walked with my father: a very dull wet day, even when not actually raining. Dining at the Temple. No one I had any knowledge of, near me, & to say the truth, I did not fancy the set I was in: hardly, if at all, gentlemen, noisy & disputatious.

29 January
Letter from Fanny. Robert Affleck who went to Australia about four years ago, suddenly returned & proposes to start for America.[340] In consequence his father thought of coming up with Fanny but changed his mind. She & Affleck accordingly arrived in the evening. I did not go to the Temple partly as they were to arrive & partly for another reason. Marked some problems & walked with my father. Went to Dent's.[341] Dent spoke of the singular fact that the rate of chronometers with new springs increases from a couple of years, if the spring be made by heat, & decreases if it is made by pressure. I formed a precarious hypothesis which would explain this.

30 January
Marked some problems. Elizabeth Murphy called. I wrote some letters. I have had since being in town two from A.P. Falconer.[342] The first of congratulation, the second written I hardly know why, except because I asked him it was possible I should meet him in Bath this spring. Both very kind, and more valued because I have seen nothing of him of late, & he has had full time to forget me. We parted in Sydney Gardens in June 1836.

Called on Jenkins, but did not see him. A very miserable chill day. Did not stay out above an hour, but felt the worse even for that. Mr Affleck dined with his brother, & both leave town for Dalham early tomorrow.

31 January
Read a little. Miss Edgeworth &c. Went with my father to the gallery in Lowther Street, a place which gives me a strong accession to useful knowledge & practical science, as strong as the French lady's dislike. Called on Jenkins, he twice on me, & I saw him the second time for a few minutes as I was just going to the Temple, where I dined the last time.[343] Jenkins just as usual.

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[340] Robert Affleck, Fanny's brother in law, son of Sir Robert (94th baronet) who later became the 6th baronet). Later generations of the family lived in Australia, where some had 'colourful' (i.e. criminal) lives. Cf. 18 February 1840.

[341] A clock-making firm: see 10 July 1839).

[342] The Falconers were a well-known Somerset family; Alexander Falconer was probably a Bath acquaintance. Sydney Gardens are the oldest park in Bath, having been laid out in 1795. Cf. 2 February 1840.

[343] Ellis had been admitted to the Inner Temple, one of the Inns of Court, in 1838, and was called to the Bar in 1840.

1 February 1840
Unwell with a cold today – so was my father also: the weather being very damp & chill is very cold giving. I stayed at home read languidly & so on. Better in the evening.

I forgot to mention at the time that with Mate's letter which he sent to Newmarket there was one to me from Joyce, inviting me to come & see him at Bath, & some days after I had one of congratulation, which I answered from town & accepted conditionally. I should like to go down there again.

2 February
Did not go to church. Walked in the circle of Regent's park with my mother. The Palmers called. The general not much worse apparently for being a ruined man.[344] He was so in reality a long while before the election at Bath made it manifest. Mrs Palmer says Alexander Falconer has bought the farm which he has at Beckton. I do remember when he first put it on his cards, & his apparent satisfaction in the territorial air it gave.

3 February
Read some of Laplace's theory of Jupiter's satellites.[345] Had a letter from Cockburn enclosing one to Joyce, which he requested me to address, as by his having had no answer his former one had miscarried.

In the carriage with my mother & Fanny: a wet afternoon so I got no walk. The sky very fine.

4 February
Looked over Laplace's investigation of the stability of the system of Jupiter's moons.[346] If this be perfect there must be some other proof of it, for that given is approximate only, & so far from our being sure of the continuance of the law as Airy says we are not sure it will continue if it does not depend on a perfect adjustment.

Again in the carriage with my mother; – after coming in, took a short walk by myself into the Regent's Park.

5 February
I worked a little at the lines of curvature on the ellipsoid. Had letters from Bouverie, Gregory and Harmer. There was not much in any of them, except a little mathematics in Gregory's & enthusiasm in Harmer's. I wrote to Gregory. My father went out today & I with him. Mr Bridges called & sat an immense time. He goes to Dalham tomorrow. We did not go out till later, to the Strand &c.

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[344] Major-General Charles Palmer (1777–1851), MP for Bath 1808–26 and in later periods.

[345] Probably Laplace's 1790 memoir on the satellites of Jupiter, which was followed by a sequal in 1791 and 1793.

[346] Either in the 1790 memoir or in *Mécanique céleste*, which appeared between 1799 and 1825 in five large volumes.

6 February
A fine day. Began a paper on lines of curvature for the Journal. I have been reading Montesquieu's Esprit des Lois these few days.[347] It seems to me a very shallow book. One finds in it no answer to fundamental questions, no reference to first or indeed to any distinct principles.

Went with my father to call on Elwin,[348] whom we saw at the office near Westminster bridge:– a nice situation. To a coachmaker's in Longacre &c.

7 February
Read Edgeworth's memoirs.[349] The first volume, by himself, is amusing & pleasantly written; the second falls off. Biographies are generally bad books, & the conclusions are mostly similar: 'una senum facies' ['old men all look the same'].[350]

A wet day; in the carriage. Called on & saw Mrs Lousada[351] sitting in a minute room stuffed with a piano & three children. John Lousada is a man who early made his option for otium sine dignitate.[352] I do not know if he could have made much of a profession, but would have been better to try, than to sit down at two and twenty not exactly 'to suckle small fools and chronicle small beer',[353] but to arrive as near it as the case admitted of.

8 February
Worked at my paper and read a little. Walked with my father. Berkeley square – one side at least crowded with people to see the royal cakes at Gunters [for the royal wedding]. The amount of vulgar curiosity people have is extraordinary.

Called on Sam Barrow who has been unwell but he was out.
Fanny indisposed and went to bed. Played backgammon.

9 February
Went to the church in Vere Street[354]– the sermon preached in what I should have thought to be an Irish accent, but which is in reality Cornish. Wrote a little on curvatures; walked with my mother in the park. Mr Elwin called afterwards; brought his cousin W. Elwin, a Pembroke man, 16W in Griffin's year.[355]

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[347] Montesquieu's *The Spirit of the Laws*, first published in 1748; first English translation 1750.

[348] Marsham Elwin, Pembroke 1830 and B.A. 1834, an equity draughtsman and conveyancer.

[349] *Memoirs of Richard Lovell Edgeworth*, 2 vols. (London, 1820).

[350] Juvenal, *Satires* 10.196.

[351] A member of a family whom were close to the Ellises (cf. Stray's chapter in the present volume).

[352] An undignified leisure: a play on the common phrase 'otium cum dignitate' ('a dignified leisure').

[353] *Othello* Act 2 scene 1.

[354] St Peter's, founded in 1722 by the second Earl of Oxford. F. D. Maurice (1805–1872) – Trinity 1823 migrated to Trinity Hall 1825, original member of the Apostles and Knightbridge Professor of Moral Philosophy, 1866–72 – was the incumbent 1860–9.

[355] William Elwyn, in fact 17W in 1837, when Griffin was Senior Wrangler.

Later called with my mother at the Waymouths. Mr Waymouth's arm in a sling.

10 February
Letter from Gregory. Smith[356] wants to see the Smith's Prize papers, so Gregory wrote to ask for mine. I wrote a note to Smith to say I had them not. And as Gregory said Walton wished for my theorems on the stability, I sat down, wrote them off, & a letter to Walton to accompany them.

Walked in the Regent's park with my father. I like getting out of the streets.

11 February
I heard today from Mrs Kilbee, a tardy congratulation with an invitation to Ireland – nugatory & so meant, but there is no use in quarrelling with people.

Found, considerably to my annoyance in Laplace, the investigations for which I have been gathering credit, & which I sent to Walton yesterday. I wrote to him to stop the printing & consoled myself with the reflection that it was better now than later.

Walked with my father in the Regents park.

12 February
I heard from Goodwin, in answer to a letter of congratulations. I wrote him some time ago. Read a little – mathematics & the Arabian nights – the latter I always begin with great delight, but weary of after a day or two.

Walked again in the Regent's park with my father.

13 February
Letters from Cockburn & Jenkins. For all he says, the former [*illegible*] is gone – Jenkins tells me no more the Tripos news. Marsh taken ill. [*page missing*]

[17 February]
[…] apparently, but uncouth.

Read Miss Edgeworth's Harrington. I have imbibed a good deal of her writings lately and am ready to acknowledge their great merit & cleverness. Harrington is certainly not one of the happiest.[357]

18 February
Read's Poinsot's treatise on Rotary motion with Whitley's 'divination'.[358] As it stands, it is not an easy book, and the interpreter is the most difficult of the two.

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[356] Archibald Smith. See 1 May 1839.

[357] Maria Edgeworth, *Harrington* (1817).

[358] Louis Poinsot, *Théorie nouvelle de la rotation des corps* (Paris, 1834), published in English as *Outlines of a New Theory of Rotary Motion* (Cambridge, 1834) – note the speed of translation. John Whitley was mathematics editor of the *Leeds Correspondent*.

Walked with my father down to Elwin's office. Met a string of carriages: we found they were going with congratulations to the queen.[359] A miserable day, so we came home almost directly, taking Dent's in our way, where I met & shook hands with Edward Kater. Noodle unconditionally.

Robert Affleck – the last time of his appearance. Fanny bent upon his going out again, & advising him to take this & that, which he takes good-humouredly. The advice not likely to be worth much, first because she knows nothing of business or money-making, second because she knows nothing of Van Diemen's land. Thirdly because the advice is not given 'sans arrière pensée' [without a second thought].

19 February
I ought to have gone on with Whitley.[360] But was tempted to diverge into some problems which took up a good deal of time. Walked with my father to Taylor & Walton's to give directions about binding Cauchy's exercises & Poisson.[361] A worse day than yesterday, snow and east wind. We sent as far as the quadrant and returned.[362] In the evening I completed a problem.

20 February
A very cold day with snow. Read as usual. My father went out in the carriage. I walked with Affleck in the streets but did not stay out long.

Mr Elwin dined with us. He has been more than six years in the office which he has now, so time passes; he was much as usual. A pleasant men, a great <deal> of taste, but superficial throughout.

21 February
The weather grows more & more severe. Read Poinsot & with tolerable success. Walked with Affleck, round the Regent's Park in forty minutes. So we inferred the circumference to be about two & a half miles. I had a letter from Gregory today, in which he mentioned that Deighton[363] wants [*page missing*]

[26 February]
With my father to Boyle's in Regent street, to Carbonell's again to Cook's & to one or two other places. A dark day, but not so cold. Met Mr Affleck in Regent Street.

Read Pliny's letters in the evening.[364]

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[359] Victoria and Albert had married on 10 February 1840.

[360] See diary entry for 18 February 1839.

[361] Augustin Louis Cauchy (1789–1857), French mathematician; Siméon Denis Poisson (1781–1840), French mathematical physicist. Cauchy's *Exercices de mathématique* (1828) was not published in translation in London, so Ellis perhaps used Taylor and Walton just for binding.

[362] The Quadrant: the central part of Regent Street, where shops had external colonnades to protect pedestrians from bad weather.

[363] J. and J.J. Deighton, a local bookseller and publisher of the University Calendar.

[364] Pliny the Younger's *Epistulae*.

27 February
My mother wished me to go to see a house in Gloucester Place, so I left Lagrange's Theorem, at which I was at work, & went there & elsewhere. Home between one & two. Mr Elwin was to have dined with us, to meet the Bouveries – but sent a note to excuse himself, on account of a bad fall he had met with, which had hurt his face very much.

Read a little, wrote to Walton, put my letter in the post office, & took a little walk. Marsham Elwin & the Bouveries dined with us. The former went out in 1834 & not in honours.[365] Before they came & after they went, read Coleridge Remorse.[366] The plot is I think slight, but there are many fine passages. Met Robert Affleck this morning.

28 February
Read very languidly, for two hours; unable to fix on any subject, or follow out a single train of ideas. A letter from Taylor – satisfactory enough. Gooden will be first or second; France[367] for choice but apparently still he himself calculates on being fourth, but Donaldson says he has beaten Hodson.[368] 'O the pity of it' if he is third, without having read seriously since his scholarship, nine hours a day would have put him tolerably high, and no man could physically afford it better.

Out in the carriage & walking, to see houses. The one in Gloucester Crescent taken, a close dingy dirty place, & the rent positively very high; comparatively not, & if we are to stay in town, perhaps could not do better. But what possible motive there is for staying I confess I cannot see. Wrote to Hoppett[369] about going down to Cambridge which I mean to do Monday for some days. To say the melancholy truth, I should like to stay longer. I have been thinking a good deal about my plans – the present is a critical moment. There is no use to stay *thumin emon katedon* [eating my heart out] doing nothing at home. If I get my fellowship in September, a couple of months after I ought to begin law, but to it I feel increasing aversion. I begin to understand how men go into the church as a matter of convenience. If I did so, under the actual circumstances of the college, everything it can give lies before me. I should be a tutor before I should have got my first brief, on the other hypothesis. I think I could make a really good tutor, private & public, doubt if I could be a lawyer, & I am sure it would not suit me. Besides I look to being an old bachelor, so no place is better than Trinity. But there are weighty objections, positive and negative.

[365] See diary entry for 9 February 1839.

[366] *Remorse* was a tragedy in five acts, written in 1797 as *Osorio* but rejected for performance, and performed in 1813 under its new title.

[367] Francis France (1816–1864), St John's 1835; B.A. 1840 (Senior Classic); Fellow, 1840–64.

[368] George Hodson (1817–1904), Trinity 1836; B.A. 1840 (Third Classic); Fellow, 1841–60.

[369] Thomas Hoppett, Ellis's gyp.

29 February
Read Thucydides, and Murphy's analysis of the properties of Laplace's Coefficients.[370] The latter often very elegant. Late in the afternoon walked in the Regents park with my father. Spoke of my plans: I have no intention of being idle. I could not bear to be so, yet I feel crushed & for the present at least, ambition is dead. I am sick of many griefs. Four or five years ago, I thought a senior wrangler would look to being either Lord chancellor of archbishop of Canterbury; now I feel like some sick brute who would fain leave the herd to go into a corner to die.

Read Murphy, Thucydides, & an abstract of a paper of Macaulay's. Robert Affleck dined with us.

1 March 1840
A very cold day, so much so indeed, that I deferred from tomorrow to Tuesday, the plan of going to Cambridge. I should like to be there when the Tripos comes out. To the church in Curzon Street: sermon partly on charity, with a great many hard names & imputations cast out right & left, 'as if to show whoe'er was edified, himself was not'.[371]

Called by himself on Elwyn; his face discoloured but not swollen – he fell against a waterbutt – & spoke of diverse matters, chiefly touching views of occupations. He speaks in high terms of N.S. Wales. Says, a man may fail if he is a fool, &c, but he is satisfied that friends of his who have gone out with ten or 15 thousand pounds will return with the same sum and increase. This part had no reference to myself; I do not think my vocation is for feeding sheep. Read King John.[372]

2 March
My father wishes me to defer going to Cambridge while the weather is so cold. I wish to go, but as it is a matter of gratification, would not set that against uneasiness to him, though there is I think no reason for staying here. Read Thucydides & did one or two problems. Walked in Regent Street, Pall Mall &c idly & purposelessly. Sam Barrow called. I have not seen him these five weeks. He has been ill again. At first silent, then warmed & opened; to make matters short, Mr Barrow has lived too fast – is going to give up the Grove & leave Bath. Which is worse, he tells his sons that he has given them educations, & they must help themselves. I have understood his property was vested in trustees for the children, in which case matters are ultimately safe, but if not, as it is all personal it may all melt away, & leave not even a trace of it's existence. Sam thought of Australia, but had not money to carry him there. The bar for years does not pay, even in favourable cases. His friend D'Eyncourt is going to make his father use his interest to get him some clerkship.

[370] Robert Murphy, *Principles of Electricity* (Cambridge, 1833).

[371] Cowper's *The Task* (1822), with 'themselves'.

[372] A history play by Shakespeare.

So when I get to Bath, a house where I have been always kindly welcomed will be in the hands of strangers.

3 March
A finer day, so I took a place for tomorrow in the Telegraph. Read Thucydides. Worked with some, but not complete success at the subject of the tautochronous curve, by a new analysis of the question, which is at least recondite.[373] After determining in a series v in terms of s & s, the latter being the initial one, I substitute for v in a dynamical equation. The result is I remark the differential equation of the curve. But this must be independent of s; therefore I make s infinite, whence I get the values of the disposable constants. The method applys [sic] happily in a medium resisting as v, as v^2 is not convenient. Besides the coach office went nowhere. Met Col. Bunbury, looking broken – 'remains of an ill-spent life?'[374] The Afflecks dined at Lady Mackworth's.

4 March
Left London at ten. The only person in the coach was a lady, whose name is, I have since found, D'Aquila, who told me as a matter of news, that both the first and second wranglers this year were pupils of professor Challis. She is one of the evangelical set here.

Dined in hall. Saw Gooden Taylor Cockburn. Took wine at the last's rooms. Walton there besides those I have named. Taylor went to a party at John Maitland's – he has finally closed with the Apostles, which I regret,[375] & Walton to his pupils. Gooden & I stayed & had tea, and afterwards went to see Gregory, who was unwell & in bed. Played backgammon with him.

Met Lingham. The lady whom I have mentioned so often is dead. He saw her as she earnestly requested a short time before her death. She was delirious, but I do not know whether she recognized him or not. The surgeon who attended her said she died of brain fever. He joined his request to hers that Lingham should see her. So ends this melancholy and remarkable story of a woman's love.

5 March
Breakfasted tête-a-tête with Taylor. Took a turn with him in our grounds; a bright morning & warm in the sun. The air felt like spring, & my heart felt lighter than it has done for many days. Called on Bouverie on whose progress Walton does not report favourably; on J M Heath, with whom I spoke about fellowship reading; on Perry to explain my occupation of the rooms I am in – Child's, in the New Court[376] – the same staircase I was in originally, but on the second floor, which makes a great

[373] Robert Leslie Ellis, "On the tautochrone in a resisting medium," *Cambridge Mathematical Journal* 2 (1841): 153–4

[374] Apparently a quotation; particular source not identified,

[375] Tom Taylor was the leading member of the Apostles in the 1840s.

[376] Edward Childe (Trinity 1838) or Arthur Childe (Trinity 1839).

difference. Walked with Cockburn & Taylor, joined by Walton & Gooden to Chesterton &c.

Dined at Gregory's who is sitting up & stayed five hours which seemed five centuries.

6 March
I had a terrible headache in the night, which however went off, but left me exhausted in the morning. Called on Gregory, Ld Napier & Craufurd there. Went to Taylor's rooms – he not in – lay on his sofa & read L. Hunt's 'indication'.[377] I am more at home in his rooms than in the New Court. Walked by myself in the streets. Got a copy of Moliere for Cockburn & left it in his rooms with the motto, 'Memor nostri vivas' ['Don't forget me'].[378] Went with him to have my hair cut at Richardson's. I have not been in the shop since our first year, & from circumstances which I could hardly explain, a great deal of matter for reflection was excited. Sat with Gooden & Cockburn in Taylor's rooms. He was gone to a Whig dinner. Tea in my own room's, now occupied by Kingdon.[379]

7 March
This like yesterday and the day before was bright & spring-like. Gooden & Cockburn breakfasted with me, & we afterwards took a turn in the grounds, Cockburn getting down on the pier of our bridge, and performing other 'feats of agility'.

Went to Whewell, & had a long conversation with him about the fellowship, the method of induction, the value of Bacon's writings, the character of their merit, the application of the doctrine of probabilities to philosophy, which we agreed in thinking a vicious principii petitio. He was very civil. Then tried to see Peacock, but he was not in. Walked with Gooden in the shade of streets, in King's grounds &c, & along the Trumpington road – met Peacock on horseback.

The tripos list[380] was expected tonight, but was deferred. At Cockburn's after hall; there arose a breezy argument about Napoleon which became a bore. Stayed for tea after coming into college for a short time with Taylor. Afterwards played backgammon with Gregory, who is, after all, a rude man.

8 March
After breakfast, looked in on Gooden, and then walked out to the observatory – in church time, which was gauche considering. As I ought to have known I found no one at home. Afterwards took a short turn with Knox & went to Cockburn's, he engaged in burning letters previous to going down: a melancholy sight. Then to St

[377] Leigh Hunt, *The Indicator and the Companion: A Miscellany for the Field and the Fire-side*, 2 vols, (London, 1834).

[378] Horace, *Odes* 3.27.

[379] George Kingdon, Trinity 1840; B.A. 1844 (8th Classic). Became a Roman Catholic and a Jesuit, 1847; Professor of Theology at St Beuno's College, Wales, 1854.

[380] For the Classical Tripos.

Mary's with him & Jenkins. Every body there: Julius Hare preached, a sermon full of thought & beauty, but here & there coarseness was confounded with strength. After it walked with Taylor & Cockburn & came back, rather late for hall. Went to chapel. Hare was there & and a good many other strangers. I tried today to see Peacock but failed.

Tea at Taylor's; Gooden & Cockburn there. Stayed late.

9 March
A dull morning. Saw Peacock. He spoke a good deal about possible & impossible college reforms,[381] said a wide field of honourable ambition lay before me if I chose to remain in the college. This I believe to be true, and a college life would if I may judge by the effect these few last days have had on me suit me better than most others. Peacock lamented the extreme difficulty of keeping men of ability in Cambridge, since the prospect of reductions in the church – remarked that few young men of any ability would willingly make up their minds to live & die on a fellowship, & very few would determine never to marry. For myself, I think I could resolve on both. I am not bold enough to contemplate the formation of ties, which would not improbably entail a lifetime of bitter & unavailing repentance. It does not cost me much effort of imagination to conceive distinctly what an unhappy home is: the grave of good feeling & of peace. But another objection is the necessity of orders.

Went to Cockburn's & walked with him & Cockburn [sic] towards the hills. The afternoon became bright & warm, & we sat down on a heap of stones; pleasant moments which past too soon.

Hopkins asked me to dine Thursday. I accepted. I expected Lingham after hall, but he disappointed me.

To the Union a debate on closing on Sundays, brought forward by Neale. I spoke against it, a few unprepared words, but a good deal to the purpose, & was well received. As soon as I done I got off in a fly to the Observatory to have tea; no one there. Miss Copsey grown into a woman: she was a wee thing when I was at Papworth.[382] Came back a little after tea, went to Taylor's. Gooden & Cockburn there.

All very much done up by the fatigue & excitement of the Union, which was excessively tumultuous later than I stayed.

Saw H. White today: he has got his B.C.L. degree.[383]

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[381] See Peacock's *Observations on the Statutes of the University of Cambridge* (London, 1841).

[382] Papworth St Everard, where Ellis had coaching from Challis. In 1831 Challis married Sarah Copsey, a widow; so Miss Copsey was her (elder/est) daughter and Challis's stepdaughter.

[383] Henry White (Trinity Hall 1835, Trinity 1835), LlB 1840; called to the Bar 1843. The Civil Law classes led in fact to the LlB degree.

10 March
I went out early; saw Gooden, before his going to the law schools. The Medal examination was yesterday.[384] Jenkins was with him – we walked together for some time & he came & rested in my room. Porcher[385] came in with a message from Taylor, that Cockburn was going off at 12 o'clock. We went to see him off, but found he was not going till three, which gave time for a walk to the extreme point of the peninsula called Newnham; we sat down for a few minutes by the sedgy waters of Cam, then returned to Trinity. Jenkins left us, and we three went into the library, which looked delightfully fresh and calm. I had a note from Lingham this morning, excusing himself on the ground of unpleasant business yesterday evening, which he wished talk over with me. I missed him however, & after sitting some time in his rooms went to Taylor's, where we had luncheon or dined, before Cockburn went off. It was half mournful half merry. I am weak enough if it is a weakness to be much depressed by any partings. When Cockburn was gone Taylor & I took a short walk, & I returned to my rooms, a little out of spirits, and the afternoon as in sympathy became cloudy & dark. Tea at Taylor's – I found him with two apostles, and myself de trop. I stayed however, out of curiosity. Then to Jenkins's who gave me some music & then to my rooms. Between hall & chapel I was at Lingham's, who had Needham with him,– so his confidential communication was again deferred.

11 March
Jenkins came to breakfast with me. I had a letter from Joyce with very little news in it. Their house is still in expectation. To Gooden's – he was at breakfast; on to Lingham's. The drift of the confidence he wished to make me, is his friend's Needham's marriage. Of course it is a very sad business, the man being a great & not well-disposed fool, and without a cross,[386] but I cannot see what advice I could give or why I was told.

Went to Taylor's. Stayed there reading by myself for some time, then in my own room. Felt half unwell, & out of spirits. Later I went out, subscribed to Peacock's testimonial, met Mrs Hopkins, & ascertained at Stevenson's that the Smith's prize men <u>are</u> entitled to copies of Baring's 'Meditations'. Challis said he thought they were exhausted.[387]

Gooden came to me after hall. We took a turn & came to Taylor's. The tripos list is enprinted & we saw the effect of it on Taylor. He was cut up decidedly – a rare circumstance with him.[388]

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[384] For the Chancellor's Medal for classical composition. Two medals had been awarded annually since 1752; in 1841 Gooden won the first medal.

[385] A college servant; he was also Alexander Gooden's landlord.

[386] That is, has not been exposed to life's difficulties.

[387] 'They': the stocks of the book.

[388] Taylor was Fifth Classic; he had expected to be higher.

Tea at Gooden's, & then to Deighton's to await the result. Word came the list would not be out till half past ten. So we adjourned to Walton's whom we found still pupillizing;[389] however he was soon at liberty, & we stayed playing draughts & backgammon & reading Percy's ballads[390] till the time named. But Deighton's was shut, & at the Hoop, where the examiners met, we were told that the list would not be out till half-past eleven. Ultimately we found it would not appear till nine next morning.

12 March
At nine I was at Deighton's, but found it was put off till half-past ten. Jenkins & I wait [*page missing*]

[14 March]
[…] some games of backgammon.

15 March
A very wet day so I did not go to church. Read some of Schleiermacher.[391] It is mystical. I expected that Taylor would call, but he did not. About two the day seemed disposed to clear, but was never day for ten minutes together. I did not get out all day, but read a little of the book Jenkins gave me, & Plato, till I was filled full of both some time before dinner. In the evening I looked at the Religio Medici & urn burial[392] again, and also at the Dissertation volume of the Encyclopedia Britannica.[393]

16 March
Read Mackintosh's Dissertation[394] regularly, being heavy & languid,– unfit for exertion, & unable to rest. Taylor called about two, & made me walk with him. We went to the National Gallery, & stayed some time. Parker's Plague of Serpents is a fine picture – I noticed it today particularly. After a little walk,– home. Read Mackintosh in the evening: I like him.

Penelope had a letter some time since from our cousin, who mentioned having dined with a Trinity man, Mr W. Jones,[395] who magnified my name exceedingly. I suppose it is the spes gregis[396] of the year below.

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[389] Teaching pupils.

[390] Thomas Percy, *Reliques of Ancient English Poetry* (1765).

[391] Friedrich Schleiermacher (1768–1834), German Reformed theologian, philosopher and biblical scholar who laid the foundations of hermeneutics.

[392] *Religio Medici* (1643) and *Hydriotaphia* (1658), both by Sir Thomas Browne (1605–1682).

[393] A supplementary volume of essays.

[394] Sir James Mackintosh's *Dissertation on the Philosophy of the Seventeenth and Eighteenth Centuries*, first published in 1830 as a supplement to the *Encyclopaedia Britannica*.

[395] Willoughby Jones (1820–1884), entered Trinity College, Cambridge in 1837; B.A. 1843 (40W); M.A. 1847.

[396] Virgil, *Eclogue* 1. 15, referring to the new-born animal seen as providing the future of the shepherd's flock ('spem gregis').

I remarked in myself with Taylor today, and I dare say he did too, a tendency to bitterness in remarks on indifferent matters. I believe it is the result of general imitation: susceptibility to annoyance, & a mind incapable of putting away sources of pain. I often feel a comprehensive dislike to people in general, myself by no means excepted.

17 March
Read Mackintosh, whom I continue to like, till one. Went to Rochard the Younger for a first sitting.[397] My mother has long had a wish that I should be sketched. The likeness of a young man is doomed not to be an object of interest to any one – his surviving friends will have known him with another aspect. To be sure my biographer may make a frontispiece to the first volume with 'Aet. Suae 22' underwrit.[398]

I came home with my father not long after the sitting was over. Taylor dined with us; talked away at a great rate well & good-humouredly, but perhaps too much. The other gentleman 'very dull in the tilbury'.[399] O si …, but I suppose 'dis aliter visum'.[400]

18 March
Read Macintosh & Stewart;[401] I was languid & did not get on very well. To Rochard at two. A prater & boaster, partly from natural vanity partly from 'a deliberate regard to his own interest'. I saw the sketch at a distance for he would not let one come near. I dare say it will be like, & if it is, so far flattering. I felt quite sad last night when Taylor was here looking at my likeness which Scovell did eight years ago, comparing it with my melancholy physiognomy. We sent on to Charing Cross, & to Parker's to enquire for the Calendar. At Brown's,[402] we enquired for Col. Napier, who is still as when Joyce wrote to me, in Hertfordshire, but is getting better.

19 March
Read as usual. I was going to call on Joseph Hunter, and went in the carriage to Torrington Square; he was not at home, as in truth I suspected, but I saw Mrs

[397] Simon Jacques Rochard (1788–1872), miniaturist, eleven portraits at National Portrait Gallary, several in Victoria & Albert. *ODNB* does not list one of Ellis.

[398] Such portraits were usually captioned in this way: 'aged 22'.

[399] *The Treasury of Wit & Wisdom* (1842), 179–80, 'A very nice footman': a servant asked why he left his master said inter alia, 'he was so very dull in the tilbury'. Taken from R. H. Barham's memoirs, written by his son, and much anthologised. Barham was well known as 'Thomas Ingoldsby' of the 'Ingoldsby Legends'. A tilbury was a light open two-wheeled carriage.

[400] 'The gods decided otherwise': Virgil, *Aeneid* 2.428.

[401] James Mackintosh (1765–1832), Scottish jurist, Whig politician, historian and philosopher, and Dugald Stewart (1753–1828), Scottish philosopher and mathematician, one of the central figures of the later Scottish Enlightenment. Perhaps Ellis was reading James Mackintosh's 'Stewart's *Introduction to the Encyclopaedia*' of 1821.

[402] Brown's Hotel, in Albemarle St, off Oxford St.

Hunter, & two daughters, Cassandra, & I suppose Polyxena. Evan[403] is engaged on some translation of Cambridge statutes; he is going into the church. So is Prate's son; he is entered at Oxford, but does not commence residence for a year or two. After staying a sufficient while I took a wandering walk, & by instinct got out of London by the Hampstead road – turned off it, not without regret, & went to the top of Primrose hill, which I descended on the other side, & returned home by the Regents Park, much the better for the fresh air, & still more, for the quiet. The streets jade & exhaust me very much. I am not strong & to say the truth, begin to find myself unfit for the wear & tear of active life. Wrote a little mathematics. At Mackintosh in the evening.

20 March
I set to work on a paper for the Journal on lines of curvature – the same as I was on, when circumstances called me off.[404] I preferred making a fresh start to piecing what I then wrote. In short things, the appearance of unity is essential. I wrote for about here hours, & then went with my father, but as my cap & gown which I wrote for had not come, we agreed to postpone the sitting, & went eastward, as far as the general post office, enquiring as we went along at one or two places for the parcel I expected from Cambridge. Returning from the city, called on Gooden, who was denied, I believe he was at home, & that I could have seen him, if I had made any point of it, but I was in a hurry & did not. He called on me yesterday. At Taylor & Walton's, wrote two letters, one to Hoppett, one to Jenkins, about my cap & gown. We were late rather, and should have lost the post, by not writing till we got home.

Read Stewart & Mackintosh in the evening. The parcel about which I had taken so much trouble came of itself.

21 March
Finished & sent off to Walton my paper on lines of curvature together with a short method of finding the variation of the nodes & inclination. I read very little, as I was detained some time by a mistake in working.

I had a note from Taylor, saying he called two days ago; the servants say no, perhaps he mistook the house, the only supposition consistent with charity to both parties.

At Rochard's; we got on a good deal today. I noticed a very beautiful head he has in one of his rooms. He told me it is a copy after S. del Piombo of a portrait of Vittoria Colonna.[405] The face is very classical, the forehead & nose nearly the Grecian

[403] Evan Hunter, Trinity 1835; B.A. 1839; M.A. 1849; ordained deacon (1841) and priest (1842).

[404] Robert Leslie Ellis, "On the lines of curvature on an ellipsoid," *Cambridge Mathematical Journal* 2 (1841): 133–8.

[405] Sebastiano del Piombo (1485–1547); the portrait is c. 1520–5. The original is in the National Art Museum of Catalonia.

ideal, & a sufficient refutation of Lavater's remarks.[406] I called on S. Barrow. We did not go anywhere afterwards.

22 March
I got up with a cold, & otherwise not well, so I stayed within all day. I believe the wind & damp has affected me, but instead of producing a decided cold, it has taken another turn. There is a false concord in the last sentence, but it does not signify.[407] Read Stewart, Mackintosh & Montucla;[408] not very diligently, nor profitably. No one called, so I was free from all interruption.

23 March
Read languidly – Stewart's first dissertation[409] & ten or twelve pages of Stallbaum's prolegomena to the Theaetetus.[410] At two went to Rochard's. A very unpleasant day, & as I was still not right I did not feel inclined to stay out longer than necessary. Taylor broke his promise of calling. He is a very good fellow, but inconsiderate. I have been a recluse long enough to know that to be forgotten & neglected is the common fate of those who do not swim with the stream. 'To forsake the course', as Hobbes forcibly remarks, 'is to die'.[411]

Played backgammon.

24 March
I was much shocked at finding Mrs Jenkins's name in the list of deaths, & did not recover from this impression all the morning. The death of a person I knew, especially when connected with a familiar acquaintance, chills me. I called on Gooden, saw him, & heard from him that she died of some liver complaint. Her health was good, but she took hardly any exercise. Gooden dreaded the effect on Jenkins: it was a happy household, & she was the centre & point of union. But Jenkins is too gentle & too pious to suffer inordinately from the loss. There will be no self-reproach & no corrosion in his grief, nor the strivings of a mind conscious at once of it's strength & it's utter helplessness.

The Afflecks left us for Tunbridge wells this morning at eleven.

Read as usual, then as I have mentioned called on Gooden came home & did not again go out.

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[406] That is, the head showed displayed no 'bumps'.

[407] A plural subject with a singular verb.

[408] Jean Montucla, author of *Histoire des mathématiques* (Paris, 1758).

[409] Dugald Stewart, *Dissertation Exhibiting the Progress of Metaphysical, Ethical and Political Philosophy* (Edinburgh, 1824).

[410] Johann Gottfried Stallbaum produced two complete editions of Plato, the first with text and apparatus (1821–5), the second with prolegomena and commentary (1827–60). His edition of the *Theaetetus* appeared in 1839.

[411] Hobbes, *De Corpore Politico, or, The Elements of Law. Moral and Politick* (1650), 9.21.

25 March
Read Plato. Had a note from Taylor excusing himself for not calling, or rather apologising for not having done so. He goes away tomorrow: writes in the style of a despairing lover. I wrote an answer which I hardly think he will get, saying what I say on the other side, that I am meet to be forgotten, & ready to forgive those who forget me.

Left a card for Jenkins, from whom I had a few hours later a note, saying he would have written announcing his mother's death, if he had known my address. It seems he looks for sympathy – he had mine – but to me his would be nothing. Walked as far as the Strand with my father. In the evening, again at Plato.

26 March
I was not much inclined to read. Tried some mathematics. Read Stewart & wrote some notes on the history of Ethics. Between two & three went out with my father, only in the Regent's Park: a very bad afternoon. Sleet & rain mixed but at intervals fair. I came in somewhat chilled. Read Elia & solved a problem. The papers, 'The Blackamoor' & XII of the 'Popular fallacies' & that melancholy one 'That we should rise with the lark', are what I like best in the second series. The first mentioned is most exquisite.

Backgammon in the evening; tolerably successful.

27 March
A letter from Mate. No news in it – he tells of being in town at Easter. Read Stewart, and Reid's Section on Visible Geometry.[412] The latter contains a good deal of amusement; the only principle involved is an abundantly evident corollary from Berkeley's theory of vision. Went to Pearse's in Long Acre with my father & at Dulau's ordered Champfort's Oeuvres choisies.[413] I get no books as matter of amusement, & am a little ashamed of this exception. I remember long-ago (that I should say so) 'Tout ce qui est beau se resemble, ce qu'on aime ne resemble à rien, et rien ne peut le remplacer'; the distinction between love & mere admiration is perfectly & accurately defined; I say perfectly, because there is not much more to be added.

28 March
Wrote to Walton, enclosing him some trifles for the Journal, as makeweights, if they please him. To Sam Barrow, in response to a note received yesterday evening, in which he says he is going to Bath, and proposed we should travel together. I

[412] 'The geometry of visibles', in *The Works of Thomas Reid (*1872), 1.147–52. Reid's geometry was a version of spherical geometry, his knowledge of which he used to refute George Berkeley's idealism.

[413] Sébastien-Roch-Nicolas Chamfort, *Oevres Choisies* (Paris, 1813). Chamfort published collections of maxims, a genre of which Ellis was fond.

wrote back that my going was uncertain as to time, & not quite final. I do not know if I am right in thinking Joyce's silence arises from the awkwardness he feels in writing to put me off, or whether he is tired of me. The last I think very improbable. Besides I am not sure if I do right in leaving home now, under all circumstances, & I have learnt of late to sacrifice a good deal to a possible sense of duty. After all too, & excepting my aunt, Mrs Crawford, and especially the Napiers, there is no one left at Bath, whom I care to see, & of these, the second would not make much difference. Wrote to Henry. I had little to say, & somehow wrote constrainedly. Mentioned Adela Everett's death. She thought herself a good deal in love with him once, & ought to have known whether it was so or not. He did not care a rush for her. I used to think this was all 'as it should be'.

Read a little Horace. In the Regent's Park – a fine day. Mild but dark.

Read the Monthly Chronicle.[414]

29 March
Went to a church in Quebec Street. An odd but not offensive sermon, the church itself handsome.

Afterwards, wrote some notes on metaphysics till two, and walked in the Regent's park. A very pleasant day. The spring seems to be commencing in reality. During the finest days of my stay in Cambridge there was ice to be seen in situations sheltered from the sun.

Read Stewart.

30 March
Worked a little at a problem of Gaskin's about a trick with cards. Read Stewart – on Hume's writings, Spinozism & necessity. Went out later by myself my father staying to write two letters on business. I returned for him, & we took a turn in the park. In the evening I played backgammon, & solved the problem in last year's papers, about the mode of [*page missing*]

3 April 1840
Up early, though the morning was cold, & worked at probabilities. In writing to Gregory yesterday I proposed an essay on the subject for the Journal. Walked with my father to Coutt's & Dent's. Saw Dent: he is full of Airy's paper on the magnetism of chronometry, which bears on his plan of replacing by glass the [s]teel balance springs.[415] I had walking enough when we got back. Draughts again in the evening – an east wind and unpleasant day.

[414] A literary periodical published from March 1838 to June 1841.

[415] George Biddell Airy, "Account of experiments on iron-built ships, instituted for the purpose of discovering a correction for the deviation of the compass produced by the iron of the shops," *Philosophical Transactions of the Royal Society of London* 129 (1839): 167–213.

4 April
Again at probabilities. Letter from Walton, recommending me to wait for Whewell's book on induction before publishing on probabilities. The advice was only a reiteration of my own idea. I think of writing to Whewell on the subject. Went to Upton's with my father to see the conclusion of a loan he makes. An hour & twenty minutes; the same time returning, an hour there. The case is one of a son ruined by his father – not so rare a one, as for the honour [of] humanity it should be. The mortgagor's son [was] at Cambridge, a Magdalene man.

Not out again;– read De Morgan's odd book on probabilities– a marvel.[416] Chilly & uncomfortable in the evening.

5 April
Got up not very well, & with a spot on the edge of the iris of one of my eyes, which I do not quite like the look of. I operated unsuccessfully on it with the point of a penknife, which requires a steadier hand, than mine often is. Went to church, saw Hume, so did not see me. Went to see Jenkins. He was with his sisters & some visitors in the drawing room, all in mourning. His youngest sister looked very pretty, more than usually so – interesting. I was right in my anticipation of Jenkins's feelings. He loved his mother very much; loves her memory still, & yet is perfectly composed & resigned. Resignation & humility are two virtues in which I am as yet very much to seek. Saw Dr Bright.

Walked in the Regent's park with my mother. Elwyn was in the drawing room when we returned, & stayed some time.

6 April
Went out early to see Travers[417] about my eye – which he says has nothing materially wrong. Between waiting & other matters I did not get back till one. I had however been up & at work early. Read a little; Macaulay's paper on Bacon.[418] Finely written; as for Bacon's philosophy, he does not understand it's spirit. The passage, where he speaks of the gratitude owed & paid to great writers, beginning 'time glides by, fortune is inconstant, tempers are soured' is extremely beautiful. Out in the carriage little, but my head would not stand it, so I came home, read Craig's appendix to Cheyne's principles of religion,[419] & lounged into the Regent's park with my father.

Stewart & draughts.

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[416] Augustus De Morgan, *An Essay on Probabilities: and on the Application to Life Contingencies and Insurance offices* (London, 1838).

[417] Benjamin Travers (1783–1858), eye surgeon, appointed surgeon to Queen Victoria in 1837.

[418] Thomas Babington Macaulay, "Review of Basil Montagu's *The Works of Francis Bacon*," *Edinburgh Review* 66 (1837), 3–104

[419] George Cheyne, *Philosophical Principles of Religion* (1705), a hostile response to Newton's *Principia*.

7 April
Not up in so good time as yesterday. I forgot to mention two letters from Cambridge yesterday: one from Gregory giving me an account of poor Temple Frere's death by drowning in getting out of college by the master's garden, the other from Heath[420] – his bill in fact. I did not do much today. Read Homer & Stewart. Walked in the Regent's park with my father: a cold miserable day – we were caught in the wet. I was chilled, but did not take cold.

Read some of Reynolds's discourses.[421]

8 April
Read Plato. Letter from Walton touching a mathematical difficulty. I wrote a hurried answer, but to the point I think. An invitation to my father & me to dine at Elwyn's to meet Ld Camperdown, who is come up sooner than expected. Accepted, out late by myself & in spite of hail & showers I got a good walk in the park. Dressed loungingly, a thing I enjoy: somehow odd bits of time have with me a peculiar character. I am never more disposed to muse, than when I ought to be engaged on some trifling occupation.

At Elwyn's we were four. Of course I took but little part in the conversation, which however was not without interest, as it reminded me of days, qui ne reviendront plus [which will never return]. Ld Camperdown, civil – I have thought he neglected my father lately, which may be accidental: whether or no, a man may be neglected by friends of all ranks, and to be sore on account of rank, is not for a wise man or for one who studies his own ease.

9 April
Two days since, I wrote to Whewell, stating my notion of writing a little essay on probabilities,[422] & asking if his work on the Philosophy of induction would interfere with it. I had a very civil answer today, saying he was very glad to hear of my intention & wished me to persevere as 'he was sure I would throw light on it'. In a musing fit, at the hour corresponding to yesterday's, I looked over some old letters, & one of the kindest I ever had, Mrs Hopkins's. It struck me, how much more real a pleasure it is, to be liked & to receive kindness than to any possible success can give. Whewell's letter showed that one of the most arrogant of men of science was ready to acknowledge me as a fellow labourer in a favourite field of speculation – yet it gave me much less gratification than the other. It is truly said, that to our kind feelings and affections we must look for happiness.

Read Plato. At three went out by myself, over Primrose hill towards Hampstead as far as the Conduit fields. Back a little before five; a cold day.

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[420] Ellis's tutor, J.M. Heath.

[421] Joshua Reynolds, *Seven Discourses Delivered at the Royal Academy* (London, 1778).

[422] Ellis's 'On the foundations of the theory of probabilities' was read at the Cambridge Society in February 1842 and published in its Proceedings in 1844.

My father & I dined at Baillie's to meet Ld Camperdown, Elwyn, Maconnochie & George Phillips – the last Lady Duncan's father. Baillie looks ill – out of spirits. There was very little to be remarked.

10 April
Read Plato before & after breakfast. Read Guizot's history of civilization in Europe & Galloway's book on probabilities.[423] About three went out by myself, & walked for two hours in the Regent's Park. A lovely day, but almost too hot.

I should have gone out earlier but Pratt called & I was glad to have seen him. He & Joyce seem great allies. He speaks in higher terms of his geology that I should have expected. Pratt's son is going to Trinity Cambridge, & is intended for the bar.[424] He mentioned Bullen is turned Unitarian; he might better have left it alone. At his time of life, a man's opinions are surely but of little consequence. Dined at the Goodens'. Burcham Donaldson Law Long Key & two more. Burcham abused Trinity people to me, & told a delightful anecdote of Carus.[425] The only diverting thing in general conversation was Donaldson's saying grace. After dinner they talked of surgery & operations, till I was perfectly sick. Long – a would be wit & can't be gentleman kind of man. Key much the same, leaving out the wit.[426]

11 April
I was not much inclined to do anything today; read a little Plato, & a good deal of a light book. At two to Rochard's, but he said Monday was the day he fixed on, as was the case. Over to Parker's[427] for the Cambridge Calendars – there were some alterations in it, and the C[lassical] Tripos papers are given.

Dined at the Bouveries. A pleasant party; the son is at home for Easter. On coming home, I found a letter from Mr Napier saying simply how sorry he was to find that I had never got his letter of congratulations, & indulging in prognostics of what I am to do or be. Nothing – a héros manqué. I wish I had got his letter, for I missed it, & in spite of his faults, he is a fine fellow, & I feel to his memory, to his local habitation & his name.

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[423] Guizot, *Histoire générale de la civilisation en Europe: depuis la chute de l'empire Romain jusqu'a la révolution Française* (1828); Thomas Galloway, *A Treatise on Probability* (Edinburgh, 1839).

[424] For Pratt, see diary entry for May 1839. His son Charles was admitted at Trinity on 27 June 1839; B.A. 1843.

[425] William Carus: see diary entry for 12 May 1839.

[426] George Long, Trinity 1818; B.A. 1821 (30W). Professor of Greek and later of Latin, London University/University College London. Thomas Key, Trinity 1819; B.A. 1821 (19W). Professor of Latin, London University, 1828–41. Key and Long had both taught Gooden, and were well known to his family, who lived near the University.

[427] The bookseller, printer and publisher John Parker, whose shop was in the Strand. See David McKitterick, *A History of Cambridge University Press, Vol.2: Scholarship and Commerce 1698–1872* (Cambridge: Cambridge University Press), 328–51.

12 April
Went the church in Quebec street; Hume gave us seats. He was there with a large party of brothers & sisters, & looked quite fraternal. Which was perhaps a more respectable character than his appearance always indicates. Read a little & did two of Gaskin's questions: generating functions.[428] Travis called to see my mother, which us within till near four. Then into the Regent's park. A very fine warm day. Read Plato in the evening; I got on tolerably well with it.

13 April
Read Plato & Guizot. At two to Rochard's, who finished the face. I think it is, as far as I can judge, a good likeness. Afterwards went with my father, as far as the bottom of Regent Street, where I turned back, as he was going to the Strand, & called on Hume; then took a turn in the Park & came home. In Regent Street, saw the youngest Miss Lowther – Mrs Bridges as she is now – & la belle Blanche. They did not see & perhaps would not have known me. Miss Blanche Lowther still handsome, but the first freshness, which 'dies in youth's brief morn', is past.[429] I have not seen them before since 1836.

Joseph Hunter dined with us.[430] A very odd man: talked well though of the beginning of Genesis, which he looks on as intended to explain several obvious phenomena, as the sense of shame, the repugnance felt towards the serpent race, &c. He remarked, & to me it was new, that the casualties which on the long run must have happened would destroy life necessarily in any animal of which we have any idea. A rock of a hundred tons would have crushed Adam the first day in Eden.

14 April
Read Plato, but laid him down in weariness, & wrote an answer to a letter received this morning from Sam Barrow, dated 'Sessions Court Bath', & written partly for the appearance of being affairé[431] in court, partly to explain what I already knew about Napier's letters. As surplusage he told me what I had heard before – his sister's Matilda's marriage with Edgar Blake, brother of a man I met at Freshford in June 36. Matilda Barrow when I saw her about two years ago was a prettyish little girl about seventeen who had apparently set up for espiéglerie.[432] Went with my father to pay two bills for Mr Kilbee, & then walked a little, but the very threatening sky made us come in. Read Reid & old letters in the evening.

[428] Thomas Gaskin (1809–1887), St John's 1827, an examiner for the Mathematical Tripos.

[429] Shelley, 'To a magnetic lady': 'Feelings that die in youth's brief morn'.

[430] See diary entry for 3 June 1839.

[431] Busy, occupied.

[432] Impishness, playfulness; misaccented by Ellis.

15 April
Penelope is going to Tunbridge Wells to Fanny, & I to accompany her on the journey. Yesterday we should have gone, but for some mistake about the coach – so it was put off till today. We had a very pleasant though rather warm drive, & arrived at Calverley Parade about four & a half hours after starting. The country is pretty between London & Tunbridge. After resting we went down to the wells (Fanny is taking the waters & looking all the better for having left behind the excitements of London in general, & Gloucester Place in particular), & then took a walk on the heath & in Calverley Park.

After dinner, Affleck & I walked as far as Rustal[l] Common, the evening lovely. I confess I wonder why anyone lives in London as a matter of taste.

16 April
One of Col. Houlton's daughters, Miss Catherine Houlton, married a son of the man who bought & built houses on the Calverley Estate. The houses do not fill so he gives his son one of them to live in, I do not know on what terms, & another son who married last year Miss Flora Houlton has got another of the villas. Quorsum haec? She invited all the party for Saturday to dine, which the others accepted, but I return to town that day, so could not without changing my plan, which for more than one reason, I did not like to do. But I went with Fanny to call & express my respect. He is very handsome, with a pleasing manner & a good look. I remember about him years ago. Henry[433] used to give her Camellias & talk diffusely about what an excellent life she would make – a circumstance which somehow gave her an interest for me.

We took a long, too long, walk towards Speldhurst; & got back done up, just at dinner time. Lying on the sofa, I got some eau de cologne up my nose, which roused me to sudden life. The pain was at first excessive.

In the evening took a short walk with Affleck.

17 April
Being Good Friday; we went to church, & on account of the sacrament did not return till twenty minutes past two. Hodson of Trinity there. Fanny Affleck & I afterwards walked to the well, or spring rather, & then into the country – we found a pretty & what today was important a sheltered walk; & met the Offleys, mère fils et fille, the latter something in face & voice like Miss Hawkins. Back about five. Read Blackwood.[434] Heard from Gregory today, but little in his letter.

I took a short brisk walk in the evening with Affleck; the wind having fallen it did not feel so cold as I had expected.

I have now kept this diary a twelvemonth, more honestly, I venture to affirm, than I ever did before. I am not conscious of any misrepresentation or supposition. Omis-

[433] Ellis's brother.

[434] *Blackwood's Magazine*, founded by William Blackwood in 1817.

sion there has been of unpleasant matter of more than one kind – the general impression ought to have been uncomfortable to be quite accurate. But this I could not attempt to give, without grave risk of exaggeration.

18 April
A note from my mother, urging me to stay a few days longer in Tunbridge, to which Fanny joined her requests: but I had made up my mind, & saw no sufficient reason for changing. I said however & sincerely that I should like to return, & it was half fixed? I should do so. But circumstances have since made me think differently, & I am afraid Fanny will hardly give me credit for meaning to do what I said.

Alone in the coach – a pleasant day, but I did not feel well.
Found a letter from Napier, inviting me to Freshford. I accepted, & determined not to let Joyce's protracted silence, which looks like trifling with me, influence my movements. The definiteness which this gives to my plan of going to Bath, makes me think Tunbridge unpracticable.

19 April
Went to church & sat on the Humes' seat, which was half empty. Joseph Hume called on me on Friday. Read the papers idly & purposelessly. Walked in the Regent's park. Gooden called while I was out. The sun hot & sickening, & my own feelings not quite comfortable. However better than yesterday, & in the evening I took a little walk with my mother, which was pleasanter than that in the afternoon.

Read Stewart's theories of perception.[435]

20 April
I was better today, but felt languid. A warm & bright day. I did very little in the way of reading. Read some Horace, one of two of the Satires. They are admirable. The grand parts of the Odes I do not like. 'impavidum ferient ruinae' ['let ruins strike the fearless man'] I used to think sublime; but now it seems hardly better than fustian.[436]

Walked in the shade with my father – got my hair wet, which was a considerable relief.

In the evening, took a turn in the Park.

21 April
Worked at probabilities. I wish to take time about the subject, since my views are not yet matured & I think they will lead to some things of interest. Wrote to Mate, supposing him at Cambridge.

[435] Probably *Elements of the Philosophy of the Human Mind* (1795) or *The Philosophy of the Active and Moral Powers of Man* (1828).
[436] Horace, *Odes* 3.3.

Went with my father to Cook's & one or two other places, & to the Water Colour exhibition. There was not much there; one or two things of Miss Corbaux's pleased me, but on the whole I was disappointed.[437]

Dined at the Temple; sat beside an Oxford man, who gave me some notion of the way, in which men's minds at Oxford are steeped in logic & Aristotle.

22 April
Wrote letters to Walton, Fanny, Burcham, & yesterday to Gregory. Did one or two problems. A very fine day. Walked in the Regent's park; the trees just coming out.

On returning, I found Gregory had called – he is at the hotel in Furnival's Inn.[438] I was going in the carriage to the Temple, & called there, but as was to be expected, he was not within. At the Temple, sat beside Turner of Trinity. He has been offered a curacy in Jamaica worth £300 a year; is tempted to relinquish the bar of which he will make nothing. Not a bad fellow, but very heavy.[439] Hawker[440] of Trinity & many others I knew in Cambridge were in Hall.

23 April
Got up unwell; a little cold, & a good deal of discomfort. I believe the coming of warm weather has affected me. I read a little however, not to much purpose, & late in the afternoon took a turn in the shade, but soon came in being somewhat overcome. My father dined at Elwin's. I invited Gregory & Hume to dinner for Friday. Both accepted. Read Mill's Political Economy[441] & played backgammon. Very heavy in the evening.

24 April
The weather hotter than ever. I was however getting better all day, & stayed within which I think contributed to my doing so.

Read some mathematics – not a great deal. Hume & Gregory called by appointment. The latter I hear from Gregory is thinking of an appointment in a Unitarian college at Manchester.[442] They stayed about an hour. Wrote a good deal after they appears to advantage away from Cambridge.

25 April
Did some mathematics & read Mill. I felt better today, & went in the carriage to call on Gooden. Excessively hot. I think this is the hottest weather in April I

[437] Fanny Corbaux, born in 1812. She was also a noted biblical scholar.

[438] This had been an Inn of Chancery, attached to Lincoln's Inn, but since 1818 had been unattached to any Inn.

[439] See diary entry for 27 January 1840.

[440] Edward Hawker, Trinity 1836; B.A. 1840.

[441] James Mill, *Elements of Political Economy* (London, 1829).

[442] The Manchester Academy (1786), moved to York in 1804, then back to Manchester in 1840. Its final move was to Oxford in 1889, where it is now Harris Manchester College, a constituent college of Oxford University.

remember. In 1832 there was some very warm weather in April. I saw Gooden; he dines with us on Tuesday. Mate called while I was out; Hume had seen him in Lincoln's Inn yesterday. Read & idled all the rest of the day. Played draughts. Gooden told me Mate tried to find Joyce on a short stay he made on his journey at Bath. But as he thought he was in Lansdown Crescent, of course he did not find him. Jenkins I had almost forgotten called on me today. He goes down on Thursday. Pearson has taken his name off the boards, rather than leave Grantchester during the vacation.[443] 'He had got his piano there', he said, & go he could not make up his mind to [*page missing*]

[29 April]
[…] feel very much inclined not to do anything. Read Shelley. Stayed in the house all the afternoon & gave up my notion of going to Bath Friday on account of the unpleasantness of travelling during the continuance of this hot weather, joined to the necessity of being a quasi-prisoner after I got there. Went to the Temple to mark, but did not dine there. Took a turn in Regent's park in the twilight. The evenings are half chill. I saw Wightman of Trinity Hall at the Temple.[444]

30 April
At length I heard from Joyce. The letter, besides what I expected, namely, a pressing invitation to go to see him at Woodlands Place & hints of reasons for not having written before, mentions Howell's (of Caius) death, & with more feeling that I should have given him credit for.[445]

He mentions having heard from Gooden, who writes in a supercilious tone of his competitors, but very kindly towards Joyce.

The weather was not quite so warm. I wrote to Penelope, in reply to a note received from her today. Also to Joyce saying I should be in Bath Monday, or as soon after as the weather would allow me to be.

Late I took a walk in the Regent's Park, but not far.

1 May 1840
I had a letter which should have been from Gooden, but was from a Cambridge tailor. Read Mill. I have nearly finished his book. Went with my mother to call on people in Hampstead. We saw the Hart Davis's. Mrs Hart Davis on a couch. She is better she says, also the father & sister.

Mrs Longman there. Also we called on the Whites – saw Miss Sarah & Miss Caroline White. Mrs White very ill; the doctor, very ill in mind & body; & Miss J. White very suffering; altogether a melancholy house.

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[443] To take one's name off the boards was to give up membership of a college.

[444] Hugh Weightman, Trinity 1835, migrated to Trinity Hall in 1837, B.A. 1840.

[445] Alfred Howell, Caius 1833; B.A. 1838; died 24 January 1840, aged twenty-four.

Lastly saw the Johnstones. Miss Johnstone as usual, but weak & feverish. She has been in some strange state of mental disease for a considerable time since I saw her. The Collingwoods there; the mother looks mad, the two daughters both peculiar. One I should say decidedly imbecile.

A gloomy course of visits.
Took a short turn in the Regents park.

2 May
A letter from Gooden with the list of scholarships. Also one from Joyce. He tells me Freshford is out of the question, Pamela Napier being so ill that they see no one. I was very sorry to hear this: it has thrown a gloom over my expedition to Bath. I hope at any time I should have been sorry to hear of the poor girl's illness; as it is, there is something more to be said, & human selfishness tends to dwell on what is personal to oneself. Also he mentions having found at the Institution, a mathematical MS of mine, which must have been lying there these four years. Strange would it have been had I found it when in Bath last. I remember leaning out of one of the Institution's windows that time & thinking of the many hours I had spent there. I seem still to feel the pressure of the stones against my hands: the calmness of that moment seems to have perpetuated the impression. The perfect calmness of introspective contemplation, of thought wholly dissevered from action, has a charm beyond most things: there is another kind of calmness which I have felt too, when the mind is steadily fixed on one object of pursuit, & feels it's energies rise with the occasion – like the former it arises from the absence of discord between the thinking & willing parts of man.

Went in the carriage to Taylor & Walton's to take my place &c. Wrote to Joyce in a shop to tell him of having done so. Not out again. Read Mill, wrote to Mate.

3 May
Went to church, did not hear the sermon which I am pretty sure was no loss. Hume called & stayed some time. Also the Strangs i.e. Mr Strang & Mrs Weymouth. I did not go out at all; gave directions about my things, read Mill & finished it. I wish to read some other book on the subject.

Hume brought me no news. He has seen Rochard's sketch of me: does not like it.

4 May
At ten left London in a railway train, which took us as far as Reading.[446] 35 ½ miles by the line the railway takes, in 1 h 36! The quickest rate I observed, was 3/4 mile in 75'. At Reading, we got into a coach. My only companion, except for a few miles was one lady or quasi lady. The road was often dusty & the weather, as warm as was agreeable. Arrived at Bath about half past six,– where I found Joyce waiting for me. Dined at the York House & came to Woodlands Place in a fly. I find that the illness of Pamela Napier, is a bad case of hooping cough, which Bunbury's little

[446] Great Western Railway trains from London had been running since 30 March.

child, who has been at Freshford, introduced there, & which has attacked two or three of the party. This settles conclusively my going there, as I have enough maladies of my own without picking up any new ones.

5 May
After breakfast, Joyce & I went down to the Institution, & sat there for an hour or two. It is much as it was and I enjoyed the air view & recollections very much. On to Mrs Maxwell's – found Henry & Anna Maria Lyte[447] there. They go away tomorrow. I did not like what I saw of either: the young lady has, if I am not mistaken, a large dash of denial in her constitution; not a good companion for my cousin Penelope, on whom I thought I perceived her influence. Au reste, she has a magnificent figure, but can hardly be called pretty. Mrs Maxwell wanted me to dine, & to join a party *suggeneias* [family party], to include besides Penelope Ellis & the Lytes, but I could not & so accepted for tomorrow. She took me to Woodlands Place in her carriage, & I was soon after called to council, touching a note from Mrs Napier, of which the principal part was, an enquiry if Mrs Joyce knew anything of my movements as the Colonel was very anxious to see me. An answer, which I saw, inviting him & Miss Napier & Caroline to dinner Thursday. I wrote a note, explaining why I had not written to him, apologising for not riding over to Freshford, on the sense of being afraid of hooping cough.

From this, & other circumstances, the conversation at dinner fell chiefly on the Napiers. Pamela & Caroline are the rising beauties of the family. Louisa was said to have altered a great deal – she is but a few months more than twenty, so that it is hardly time. I would not be a woman, to see myself fade away so soon.

Colonel Napier was spoken of with the warmth his fine qualities deserve. I remember with regret that when I dined with the Joyces in May 36 I spoke depreciatingly of him & of all the family – although I liked him & them.

6 May
Yesterday, after dinner Joyce & I walked across Hampton down, to which we are close. I rode over it with Alexander Falconer in Feb 36. Joyce & I spoke of my plans & feelings. I have always been unhopeful, & now am more so. I begin to feel that something has passed away, & would give the senior wranglership to be again seventeen. I know that people would be apt to say, it is soon to talk in that way: that in force of mind & character, in consideration in society, in juster views – I have gained much in the interval. All this I know, but in the first place,– no future Olympiad will change me as much; in the second, hobledehoyhood with its vague images of beauty, it's dreamy ambition seems to me the fairest portion of life. I never wish to be again a boy, fishing for nominative cases in the Delectus,[448] riding & pony & drinking milk and water. I would not live over again that season of mental strife & so to speak

[447] The Maxwells and Lytes intermarried; Anna Lyte, daughter of the hymnodist Henry Lyte, was later Anna Maria Maxwell Hogg.

[448] Delectus: a graduated collection of Latin or Greek passages for translation, usually with notes.

desolation which I passed through when I began to think. But time, which may make me anything from junior dean to president of the republic, can never restore the summer of 1835. As I then felt, I shall not feel again. Ichabod, the glory is departed.[449] Those were not days free from pain, but they had a charm now lost. Pain too has become a part of myself. I have not lost this brightness by sensuality, & honestly believe myself more gentle more susceptible of kind feeling now than then.

Word came that Napier was coming in by the boat. Joyce & I walked down the hill to meet him. He did so, & sat at the Institution an hour & a half, then walked up Milsom Street &c. Napier went to call on Miss Phipps in Raby Place. I walked up to Woodlands Place, dressed & walked down again. Met Napier by appointment at Tilley's & saw him off by the boat. Called at the Camperdowns, went to the Institution & reached Bennet Street a little before five. The Gore party came later, Bessy not to be compared to Penelope, who is really a very pretty girl. Played dominoes with my cousins, a kind of thing I like. A wet evening: the first rain for a long time.

7 May
Went early into Bath, called on the Crawfords, who asked me to dine today, the only day they had. I accepted & went to the Institution to write a note of apology to Mrs Joyce. Frederick Joyce coming in at the time took it. Then to Bennet Street. Penelope was sitting with her particular friend Caroline Browne. Young lady friendships are odd things, very demonstrative & not very permanent. Subscribed to the Institution. Read Maculloch on taxation[450] there & walked up with Mrs Joyce, who called to look for her son. Previously Joyce & I walked to the new bridge below Norfolk crescent.

Dressed & went to the Crawfords in a fly. No one there but a Miss Dorian I think. The doctor looks old; vhe spoke of his views of things in general – they are not far wrong. I imbibed from Mrs Crawford some news of what has been doing here the last four years. Miss Jenkins i.e. Mrs M. Martin 'is gone to the bad', which à priori was not improbable.

8 May
I expected that Napier would have come in but he did not, owing I suppose to the wetness of the morning. Joyce & I went down & were sprinkled before we arrived at the Institution. As it cleared we went on & lounged into the Bath exhibition of pictures. Not very interesting & not a soul there. Called in Bennet street & sat till three. At the Institution I found Joyce & wrote an answer to notes received this morning from Fanny & Penelope. The latter speaks of the immutable future in opposition to the transitory & irrecoverable present & past. It is well thought & well expressed; they are lucky to whom another state of being is a definite & unterrifying prospect.

[449] See diary entry for 27 May 1839.

[450] John McCulloch's article on taxation in the supplementary volume of *Encyclopaedia Britannica*, 1824.

Then we came out, & after dinner walked along the top of Claverton & half way down the Brassknocker hill. Of course, many & many a forgotten thought recurred during the walk. Pamela Fitzgerald, the unrighteousness of the government of 98. Milton's sonnets. The 'snow that falls into the river'. The 'waters that scarcely seem to stray'.[451] The adventure of being run away with down the hill. The ride up, after a sparing dinner of boiled mutton. All these recollections (trivial enough to be sure, many of them) are connected with the Brassknocker.

9 May
Joyce & I went down to see if Col. Napier had come in; we met him by Sydney Gardens. Joyce after a while left us. Spoke of my views with very kind interest. He clings to the notion of my going abroad after getting the fellowship. Says he would have me look for some of the commissionerships, of which there are now so many. The government wish to make a civilian party, at the bar & elsewhere of men of science & ability; & my father's views, & my own college honours, would render me at least an eligible candidate. Then he thinks I might by degrees make myself useful to the Whigs, & parliament & the rest would lie before me, if I found I had the kind of ability required. In the meantime, I should destroy my little stock of health & narrow my views by plunging into law immediately.

At twelve, I left the Colonel at the Phipps's & found Joyce at the Institution. He proposed a ride, & Sanders Watson joined us. My horse came to Bennet street, whither I had gone at two, & Joyce had been waiting for me. We rode up together to Lansdown Crescent. I went in & saw Anne. Kippis has been ill but is now recovering.[452]

The three then went up on Lansdown, galloped around it, & to Prospect Hill, thence we went down the sheepwalk to Weston & so home. Many & many a time have I taken this ride, much oftener when I was a mere boy, then during the latter years of our residence in Bath. Thus the kind of associations connected with it differs from those I have already mentioned. I am not saddened by them.

In the evening took yesterday's walk.

10 May
Went to church at Bathwick. After service called on my aunt & invited myself to dinner. Went on to the Barrows. Fanny & Matilda besides Mrs Whale. Returned to Bennet street, went with my cousin to the Octagon. Coming out, I was surprized into accepting an invitation from Lord Camperdown to dine today.[453] I was sorry for it directly after, & went & excused myself to my aunt. Then to Woodlands to dress.

[451] From Byron's 'Lara, a tale' (1814).

[452] Andrew Kippis Watson (1800–1877).

[453] Adam Haldane-Duncan 1812–67, 2nd Earl of Camperdown (Trinity 1829); MP for Bath, 1841–52.

Lady E. Duncan sat next to me (Capt Ellis, the Andrews & Sykes made the party) & led the way to enquiries about Frank? – which she made with interest & regret. I was half surprized at her doing so, but impressions early produced, and which do not come into contact with the realities of life, are often very permanent.

There has been a report Ld C. told me of his marriage. After dinner a long conversation with Ld Camperdown first about my father, of whom he spoke as he deserves. Then by a natural transition, of what his having accepted the offer made him after the Reform Bill might have done for me, & finally of the great chance there would be, if my getting in for Bath next time, moyennant [by means of] a certain expenditure, & certain arrangement with reference to the candidates.[454]

Hobhouse, he thinks, might be prevailed on not to stand, & give me his interest. Then my connection with Napier would get me the second votes of the Roebuckites. The idea is, that Hobhouse & Roebuck will not pull together from personal feeling – but that a new man might combine the advantages of both.

11 May
Went into Bath with Joyce & at the bottom of Pulteney street, met Col. Napier with Mrs Napier, Louisa Caroline & Sarah. The latter greatly grown, so much so that I hardly knew her. I should not have perceived that Louisa was altered; people look, especially when in delicate health, betters from one day to another, & she is subject to a certain degree of puffing when exposed to the wind.

I walked to & fro with the Colonel all the morning. He took me to Harrison's a protégé of his, a self-taught arithmetician & half mad; au reste an old soldier. I bought his book – five shillings which preyed on my vitals. He introduced me to Landor a pompous married man, excessively negligently dressed. There is no doubt great talent in Landor & he writes fine pure English, but overrates himself prodigiously.[455]

Pratt, Blaydes a clergyman and two young ladies, school girls, dined with us. An argument after dinner on the promulgation of opinions. Everyone who spoke, meant more than he said, but the cloth of one of the party required 'reticence'. The origin of the conversation was Joyce's very unjustifiably saying that I had said Napier would talk irreligion before his daughters.

12 May
I found myself very unwell this morning. Did not get up till two. Wrote two notes, one to my aunt, one to Sanders Watson. I was to dine there today, i.e. with the Watsons, but excused myself. Read Byron & Rousseau (the Confessions) all morning, & talked with Joyce who kept walking round the room all the while. Not good for

[454] Camperdown, then MP for Southampton, won the Bath seat himself in 1841.

[455] Walter Savage Landor (1775–1864), writer of English and Latin poetry.

feverishness. After getting up, read Robertson's Charles Vth[456] and received two letters which had gone to Bennet Street. Chess in the evening.

This day eight years used to be [*illegible*] & noteworthy.

13 May
Better this morning: played chess & idled till twelve when the fly came which was to carry me from Woodlands Place. I left it without much regret, conscious that I made a mistake in coming to it, as I should have enjoyed myself much more by following my own devices, without the restraint of staying with the Joyces. I have not fallen in love with them, & it was a little too bad to demur at losing my society when I was only going among my own old friends & relatives.

Went to Bennett street; sat there some time. Then to the Institution, & returning thence, I sent to my lodging, dressed & to Bennett Street.[457]

There dined there the Gores, Miss Ackland. Miss Caroline Browne came to tea.

14 May
Napier came in today. I was not sure of his coming, & when we met I was obliged to go to Norfolk Crescent to the Gores, where I took luncheon; always a bore to me, & particularly so today. Miss Ackland was there – we went away together, & walked through the private walk, of which I happened to have a key. Many years since I did so before. Miss Ackland asked me to dine Monday. Accepted. We parted. I went to Miss Williams's, the colonel[458] just gone, so I walked in pursuit of him as far as Laura Place, then gave it up, took a fly & returned home. Out in my aunt's carriage as far as the viaduct on the Warminster road. A very lonely drive. Saw Napier on the poop of the iron boat, which passed not far from the road.

Dined at the Barrows. A Mrs & Miss Hilbert & Caterris, all connections of theirs, made the party. Matilda Barrow looked very pretty, rather less lively than two years ago, with more of reserve & less childishness.

Took a turn with two of the girls along the terrace walk – a lovely evening.
After leaving the Grove, I walked down Lansdown crescent & met Sanders Watson there.

15 May
I went to the Institution immediately after breakfast, and read there for two or three hours – Maculloch's [*sic*] article on Taxation. Saw Pratt & Joyce. I was strongly reminded of my old studies in the Institution, so quiet & so soothing. Sed quod simile est nequit esse [but something like that cannot be] & the past never returns; the shadow on the dial never goes back. This day four years was that of

[456] W. Robertson, *History of the Reign of Emperor Charles V* (1774).

[457] Bennett is correct, the previous 'Bennet' wrong.

[458] William Napier.

the eclipse. Walked with Joyce through the park to the Victoria nursery, which was Collens's.[459]

Mr Barrow took me to Ld Camperdown's. Jacob Barrow & Hobhouse were the other guests. The last I liked tolerably well. He has a vacillating [unfined?] look & manner, which agrees with his character. Il affiche liberalism, & carries it too far.

I was very uncomfortable all dinner time.

16 May
Met Col. Napier in New Bond Street, & walked with him, till he went to call on the Philippses. When we reached Ray Street there came on a shower, & he said he was intimate enough to take me in, so in I went. Miss Phipps indeed is a half acquaintance of mine since before we left Bath. She is a very nice girl, & what is more, good & amiable. The father is an old brute; she & a younger sister live with him & the rest of the family are dispersed. So she is in many respects to be pitied.

At the Institution found Joyce. We took a turn together & I went to Bennett Street.

Joyce took me to dine at the Pratts. Sutcliffe there. The rest underbred relations of the host. The whole party I think below par. Lacryma Xti produced – not a fine wine, though I dare say what we had was a good specimen as Pratt seems to pique himself on his wine.[460] But the claret was the worst I ever tasted, and the port, though proné [recommended] as being 30 years in bottle, only tempted one to ask, why it was kept till it was not fit to drink.

As soon as I could get away, I went to the Grove, for this morning Sam Barrow came up to me, as I was walking with Napier, & told me he was in Bath for a day. He is looking for what he cannot get, a Newfoundland judgeship. We walked in the tunnel walk[461] – two days before we left Bath we took this walk, & I remember thinking it was the last time. So but for this flying visit of his, it probably would have been. Left him at twelve, full of 'auld lang syne'.

17 May
To church, the Octagon, with my cousin. Left her on coming out & walked to the Grove with Sam Barrow & Caterris. Stayed there some time then called on the Watsons, walked down by Cavendish Place, crossed the crescent & then went home. Wrote a long letter to my father.

Dine with my aunt; no one there. Read the book of James &c in the evening.

The Watsons told me that Hammet has lost £8000 in mining speculations, & leaves Bath in consequence. A bad business for my old enemy Ellen Linkwood.

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[459] Collins' garden, an open space in Bath and a favourite of Ellis's.

[460] Lacryma Christi (the tears of Christi), a wine grown on the slopes of Mount Vesuvius.

[461] Bath has the longest walking tunnel in Britain.

18 May
I found Napier at Miss William's; went with him to the Guildhall on some business of his. We then took a turn together & as I was engaged, we parted early. He will not be in town again before I go, & so we shook hands, and said goodbye – with sincere regret, on one side I am sure.

Went to pay some visits in my aunt's carriage; she staid at home. Penelope & I went in it. I called on the Bullens, whom I had seen & shaken hands with in the course of the morning, & Lady Bateman & the [sic] John Rothery. It came on wet, so we gave up going any further & returned to Bennett Street. Afterwards I walked to the Institution, read political economy there, went to my lodgings & dressed.

Penelope & I dined at Miss Ackland's, & met the Gores there. A pleasant evening – music & old recollections. I had not been in the house since June 34, when we went to hear nightingales. I was full of Parasina in those days.[462]

I went to Bennett Street with my cousin, & stayed till eleven.

19 May
This was a cold unpleasant day. I went to the Institution after breakfast, found Joyce there, & after some time took a walk with him through Widcomb[e] & Lyncombe up on Combe Down & so back by Prior Road – we were more than two hours about it but walked slowly. A beautiful vale it is: I mean Lyncombe, & the views near Prior Park. But the day was cold & dreary.

I dined with my aunt – a partie quarrée [a foursome]. The Brownes took Penelope out walking, & my aunt immediately spoke to me about her. Mr Christie, whose proposals she declined on the score of narrow means, told her, first in a letter & then at a recent interview, that he hoped to be able to increase his income, & in the meantime should consider himself engaged. She refused him absolutely & briskly: 'she had changed her mind'. The same evening they met at a party, danced together. She led the way to an 'explanation', & concluded by accepting him. This is of course only heads[463] of what I was told. But she acted very inconsiderately & has entangled herself with a man, whom I believe she does not care about, & whose income is much too small – £500 at the outside.

Today there was a flower show, where she & Christie met; she came home triumphant & excited, the Baileys there, father & son, 'gave him the tips of my fingers'. I know very little of her feelings, but strongly suspect there is some other attachment in the case – to Bailey perhaps, possibly to someone I have not heard of. My aunt is but half in her confidence. I think on this hypothesis one might see what was influencing her conduct in rejecting & accepting the same man within twelve hours, & she seems to me to look thin & anxious, as if something was on her mind.

[462] Byron's poem 'Parisina', which features a nightingale, was published in 1816.

[463] A summary.

20 May
Was on her mind or were on her mind, whichever is most correct. If it is so, she has & deserves my pity. Mr Christie called today, & I understand an engagement was made: a very unwise step.

I lounged idly about all the morning, then rode with Sanders Watson, by Charlcombe & Wooley, to Swainswick, so up on Charney down, which we rode round, down towards Bathampton, up the glen between Charney & Little Salisbury, & home by Sackhall & Camden Place. A long ride which our wanderings protracted.

Dined at the Watsons. No one there. Kippis looking better than I expected. The rooms very handsomely furnished. The poor dear Watsons' head just a little turned, enough to swear by, in the vulgar phrase. Walked on Lansdown Crescent with Sanders before going home.

21 May
I got a tiresome invitation from Mrs Joyce for today, which I accepted.

I went in to pay some bills, then to the Institution, & returned to Bennett Street. Col. Glover & three sons & daughters there. Also Miss C. Browne – all at luncheon.

We were going to Prior Park. The party was the Gores, John Maxwell, Penelope & I; & was joined by Miss Armytage & Christie. Some walked, I went in aunt & Maxwell's carriage. We were shown over Prior Park. Not much to see, that any of the party but myself saw. I saw many ghosts, 'rerum simulacra'.[464] The library was burnt down in May 36, many months after I was there, & the new theatre is fitted up as a library, so that I did not recognize it. But as I went up the stairs leading to it, thinking of nothing less, I felt that there was something associated in my mind with the scene, though what it was, I could not at first recollect – something like the favourite story of the climbing boy, who finds his way down the wrong chimney.

However, forgotten or recollected, c'est fini. It was hardly worth coming to Bath to make this discovery, yet it has been made, & would not have been made so soon without.

We walked down through the grounds, Christie poking his nose in a very amusing way into the folds of my cousin's parasol, which he carried. No one, however, observed this mannerism but I – at least, I think not. Dined at the Joyces. S.P. Pratt came to tea, which prevented our walking, which I regretted as the evening was lovely, & I wished to take a last look down the Brassknocker Hill.

Joyce came into Bath with me. We walked across the crescent, I went up to our door, & took the knocker in my hand, but let it go without disturbing the repose of the

[464] Lucretius, *De Rerum Natura*, 4.239.

deserted rooms & passages.[465] The shutters are shut, one leaf in the drawing room was left ajar, & the impression of the whole is utter desolation.

22 May
After doing some business I went to the Institution & met Joyce there by appointment. We went into Sydney Gardens, walked about there & sat under the trees. They have a desolate air, which indeed always seemed to belong to them. We afterwards went in a fly to call on Bond at Weston, but he was out, & returning on John Duncan, who was also out. We returned to the Institution, & then gradually lounged up to Belvedere, where we shook hands & parted. A fine bright day, the sun rather troublesome. It was then a little after three. I sat down & wrote this journal & afterwards, a note of farewell to Napier. This brought me to five o'clock. I dressed & went to Bennett Street. Christie, Miss C. Browne & Bessie made the party. The first named is a pompous man rather. I left my aunt at eleven, & walked up & down our crescent till midnight, then went home & wrote till after one.

23 May
A chill dark day, fit for partings. I breakfasted & took leave in Bennett Street – Christie announced before I got off – & started off, John Rothery in the coach as far as Chippenham; talked of his eldest son, who is probably going to Trinity.[466] After he left us, I began to doze, & continued partially asleep for three or four hours. This was owing partly to my not sleeping much last night, partially to mental oppression, which is apt to take this form with me. Dined at Newbury. Got home a little before nine. My father & Penelope dined out.

It is over now, & I enjoyed it less than I might have done, but I was not quite right, the greater part of the time. The impression it leaves is saddening. My last visit in 38 was more cheerful. Bath has fairly become to me, 'a garden of faded flowers'.[467] I may deceive myself in thinking that my feelings are completely changed; but there has been going on a great deal of hardening & materializing process. Nevertheless, I am glad I went, if only to see the nobleness of my aunt Maxwell's nature, & to learn to render her character the justice, which if I had parted with her forever four or five years ago, I might have refused.

[465] Ellis refers to the house at 12 Lansdown Crescent where his family had previously lived, since moving from no. 18 in 1831.

[466] Four men of that surname went to Cambridge, but none to Trinity.

[467] Thomas Moore, 'O banquet not'.

24 May
Went to church. Mr Dibdin preached, better than usual. Afterwards went with the Afflecks to their lodgings in Windham Place. Walked in the Regent's Park – a fine afternoon. Dined at the Humes. Babbage[468] there, with whom I had a good deal of conversation: he introduced the machine, his 'infernal machine' as some one called it. Also Wheatstone, who is a 'man of science', & some others – a party of 14, including two Miss Humes & a cousin of theirs.

Babbage a gentle mannered man, urbane is perhaps the word; he looks though as <if> he is a hard biter.

I mentioned the parliament scheme to my father, who did not, rightly I think, fancy it.

25 May
[*part of page missing*]

[26 May]
[…] much broken by illness.[469] He has been an invalid now these two years, & resides now at Cheltenham. Elwin rather out of sorts. There was very little said which could be remembered, and both the Afflecks & Hume went away to parties.

Walmesley stayed late & I got exceedingly sleepy.

27 May
Read Brown diligently. I was engaged to go to Rochard at four, so went out a little earlier than usual, & walked in the Regent's Park, from whence […] no more [*rest of page missing*]

[*pages missing*]

[4 June 1840]
[…] time, but is not ill done. I treated the mother lightly, attacked Walton's politics, half in jest, half in earnest; likened Sheehan to one of his own leaders, doubted if Napier was not over lordly for a liberal, & enquired whether it was necessary to form a club to do nothing.

Mate called about two. He is not looking well. I went out with him to walk. He would not stay for dinner.

Cockburn, Forbes, Philip Duncan & Mary Paul dined with us. Duncan looked more benevolent than ever; he is a bore though to a certain extent – but I like & respect him. Miss Paul does not rise in my regard. She stayed the night here.

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[468] Charles Babbage (1791–1871), Trinity 1810, migrating to Peterhouse in 1812; B.A. 1814; founding member of the Analytical Society. The 'infernal machine' was his Difference Engine.

[469] A Bath friend who had given Ellis an edition of Horace in 1829.

5 June
Gregory sent me Smith's problem paper.[470] He is one of the Trinity examiners this time. I worked at it for a good long time. Wrote, but did not send a letter to Gregory about it. Also some metaphysical notes.

Met, by appointment, Cockburn at the Academy's exhibition. We stayed there an hour and a half, & to my surprise meet Crowfoot there of all odd people.[471] He goes to Reading for the summer, & is to be ordained on his return. Also, I think, I saw Arthur Joyce, but much improved granting his identity. 'Je suis dans une position fausse' ['I am in a false position'] with respect to him. I then came home; met Hume. His party let yesterday. It seems that Joseph Hume [is] no longer what to me he was for so long, a wandering voice, a name read of in the papers – & nothing more.

6 June
Breakfasted with Forbes[472] at his lodgings in Half Moon Street. Pirie of Trinity, 5th in Smith's year, & now a lawyer & lawyerlike & a friend of Forbes.

At eleven went with the latter to the Athenaeum where he proposed me. It is so long before I can be blackballed that the anticipation nowise affects me. Before then, it is likely enough that I shall 'sleep that sleep whence none may wake, where none shall weep'.[473] So be it. I have familiarized myself to the idea of death; & in the many moments of despondency, which my own infirmity, & that of others, produces, took to it as a release, & feel that it is no use to live to give & receive pain. We were not made to torture one another – but men do it. I see it & am sick, but feel bitterly, that I am not entitled even to satisfaction of condemning.

Came home. A hot day; not out again till late. Cockburn called but did not stay long.

7 June
Not very well this morning; did not go to church. Read Brown &c, & did some mathematics; took a turn in the Regent's Park, in the inner circle, which is the quietest part. A fine day. Barstow of Trinity has been immortalizing himself at the late election by breaking a man's head.[474] He was fined by the magistrates, but is going to appeal, on the privilege of the University.

Later, I went out again.

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[470] See diary entries for 29 April 1839 and 10 February 1840.

[471] See diary entry for 25 April 1840.

[472] James David Forbes (1809–1868), Scottish physicist and glaciologist; Professor of Natural Philosophy at the University of Edinburgh, 1833–60.

[473] Percy Bysshe Shelley, 'Hellas' (1821–2).

[474] Thomas Barstow, Trinity 1836; B.A. 1841. He was denied a scholarship because of his conduct, and fined by the town magistrates. See *Romilly's Diary 1832–42,* 192, 194.

8 June
Read Brown diligently for two hours & more. Wrote a letter to Gregory, & this time sent it, to thank him for the problems. Went with my mother to call on the Humes. They were out. I did not go out till late, & then not far, as Dr Chambers was expected. He came at length, said my pulse was excessively languid, & that there was some irregular action of the heart. He naturally ascribes it to hard reading; I am disposed to refer it to other things.

Challis & Cockburn dined with us. The former is in town on account of the Greenwich visitation & called yesterday. He is looking well.

9 June
Read Brown, but was too languid to get on well; worked at an equation in the figure of the earth. A very close day; I kept within all the afternoon, & went in the evening to the Temple. Cockburn Taylor Bailey & I made a mess. Bailey was in force & amusing. He is a cleverish fellow but has not much mind, & is but an indifferent hand at making a salad. I came back & took a turn in the Regent's park.

10 June
I had letters from Joyce, Gregory & Napier. The first contained but little. He said he had heard minute particulars of what I was to do at the next election from two or three people – but found they all came from Dr Crawford. He knew nothing about the matter & was angry I had not told him. Now he affects to be particularly well informed. The spite of so small a creature as Crawford, however, however shown, or however hearty it may be, is of no consequence whatever. Gregory's was in response to mine, and mentioned some particulars about the examination. Smith says Jones is as good a man as any who went out below Goodwin. Napier's was to tell me he had previously written to me to Cambridge, & had sent a proposal which he thought I would have noticed, touching politics.

I wrote him a letter, in which I told him my present views or no views on the matter. I was very much agitated by these letters, by two of them at least, and did not recover all day.

I went out late, to Cockburn's & thence to the Temple, where I concluded this term. After dinner Cockburn & I took a little walk, & I called on Arthur Joyce, by way of getting rid of the awkwardness I feel with respect to him. Came home with a headache.

11 June
I felt shook this morning & out of sorts. We were going to Richmond today, but the plan was given up in consequence of my not being well. The Queen was shot at yesterday on Constitution Hill.[475] I went in the carriage with my mother, & amongst

[475] Her daily 6pm carriage ride was predictable and indeed publicised. This attack was the first of seven in the period 1840–82.

other places, to the vicinity of the place. She went to it. I felt very languid & did not. But although I kept very quiet, I had a fit of languor, more intense than any I have had these three years. The machine seems out of joint, just now. Marian Affleck & Sir Robert called today; I just saw & shook hands with the former.

12 June
I received from Cambridge today, Napier's first letter. He repeats his advice to travel, & evidently his leaning is against any political or other occupation just now: and I believe he is right. The proposal, however, is to make overtures to Roebuck, providing that he can in no way seek to reconcile vital differences, or in any manner weaken Roebuck. I wished to learn what his proposal was, although, as matters are, it cannot affect me. Also a letter from Lousada Barrow, dated Bellary, 24th April, and which was in town two days ago.[476] Not much news in it. He asks, but somehow faintly, after familiar faces. Blanche Lowther not forgotten, 'so doth beauty like a dial hand steal from his figure & no pace perceived'.[477] But the letter is full of kind feeling & affectionate reminiscences. Saw Chambers again.

Out in the carriage; saw Edward Impey & one of his sons, who is at Addiscombe;[478] walked home through the parks with Penelope; met Mrs Chambers & her daughter. Took a turn in the Regent's Park.

13 June
Wrote to Napier; I said that what I had already showed sufficiently what my views were; that were I to stand I must be counted with the Whigs & not with Roebuck, & that I am not radical enough for the latter. That I should adopt something like his plan, that (as he had alluded to my private circumstances) I might say, I was independent of a profession – so far as to be able to live quietly without one – that if I felt my health unfit for active life, I should betake myself to Trinity, & live there as a quasi fellow.

It struck me that this day four years ago, my journal contained an expression of the bitter feelings then connected with Cambridge: that the time was out of joint! What I meant, I did not care distinctly to express, but have done all that in me lay to set it right, & now I look to this place as my probable life-long home, to it's society & ways as my society & ways. So much for consistency, at least for the outward signs of it, for I still regret, & see no term to my regret, all I left at Bath in 36. The impossibility of returning to those times or of realizing their anticipations & dreams has given a different direction & greater prominence to my views for futurity, but has not altered the feelings with which I regard them.

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[476] Ellis's childhood friend was serving in the army in India; he was twice chief commissioner of Oudh. Bellary, a city in the state of Karnataka, India.

[477] Shakespeare, *Sonnet 104*.

[478] A military seminary set up by the East India Company in 1809, taken over by the state and closed in 1861.

Cockburn & Taylor called;– I walked with them. Called on Hume & in Euston Square. The Afflecks & Ms Paul took tea.

14 June
Went to church. Heard the Athanasian creed & one of Dr Dibdin's sermons. Much more spirit in the former, but not perhaps the best. Read Whewell's book on the Philosophy of Induction, a work of much thought, but not free from obscurity.[479] Very many of the views, are so far my own, that they have, more or less perfectly formed, passed through my own mind.

Walked by myself in the Regent's Park. I am sorry to say, my father is again lame, & unfit for walking. I hope it will go off as before.

A fine dark windy day. I stopped to listen to a field preacher: quis nescit Volusi Bithynice.[480]

Read Whewell again.

15 June
I was surprized to get a mathematical tract by post today. It is by 'James Booth B.A. T.C.D.' – who sent it to me I have no idea.[481] My name is put on the title page 'T.C.C.'. The postmark is London & Cambridge.

Read all the morning till past three. Whewell & Plato. Gooden called, & sat for an hour. He told me some college news, not of any interest. Dressed, took a languid walk. I do not feel very well; came back & read Plato again & went with my father to dine with the Camperdowns. Elwin, Col. Jervois,[482] Lady Duncan just returned from Madeira & a Mr Maitland. Dull. Ferris told me Willoughby Jones,[483] who has I see got a first class, glorified me most exceedingly. He is the man I mentioned some months since as being at Bath. A banana produced at dessert – something between a pear & a bad fig.[484]

16 June
I had a note from Cockburn, who said he was going off hurriedly, & regretted he could not call.

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[479] William Whewell, *The Philosophy of the Inductive Sciences, Founded Upon their History*. 2 vols. (London, 1840).

[480] Juvenal, *Satires*, 15. 1: 'Volusius of Bithynia, who doesn't know the kind of monsters that crazy Egypt worships?'

[481] James Booth, *On the Application of a New Analytic Method to the Theory of Curves and Curved Surfaces* (Dublin, 1840). The book was presumably sent by the author, a graduate of Trinity College Dublin (TCD).

[482] Colonel William Jervois (1821–1897).

[483] See diary entry for 16 March 1840.

[484] Bananas had been known in Britain since 1633; they became popular after John Paxton bred a successful cultivar in 1835.

Forbes called; he goes Thursday. Read and finished the Theaetetus.[485] Also Whewell's book & worked at some of Booth's problems. His method applies happily to some cases, as every conceivable method must. Went out for half an hour by myself; dined early & went to the House of Lords. Ld Camperdown gave me an order yesterday, but by some mistake, I thought there was no house, & came away.[486] I was just as well away, as I had a headache & was otherwise not well, but the subject was one in which I take some interest. I walked home all the way.

17 June
Better today; it was cooler & reviving. I read some fifty pages of the Gorgias[487] & some other matters. Saw Dr Chambers. Went out by myself, to Dulau's about Cousin's translation of Plato.[488] I was detained by the wet; looked at 'M. Crepin', a work in the same style as M. Vieubois, but not it strikes me so good.[489] Returning, I as overtaken by the rain, & went into the Pantheon.[490] There are one or two tolerable pictures there: a copy of Titian's Ariadne, which is a beautiful picture. Lamb's remarks on it I like very much.[491]

Dined at Mr Wainwright's. 18, so of course, rather a heavy business. But Gen. Golding & his daughter were there, & Fanny being there we came into contact. Many years it is now since the intimacy with the eldest daughter, who is since dead – sixteen or seventeen I suppose. I can just remember her; Golding was a familiar name then, & mixes with many of my earliest recollections.

There was music in the evening, but I did not stay long.

18 June
Read a good deal of the Gorgias &c. Wrote something on the doctrine of parallels. Called on Hume, & then on Gooden, found neither at home. I came back by the Regents' Park, & staid out a shower under a tree. I was tired when I got home, & read Plato drowsily. I did go out again & read a little in the evening.

19 June
A decidedly wet day. I read for three hours & finished the Gorgias. I felt, when I had done, that I was stuffed with Plato. Robert Affleck & his brother called. The former has been incognito in town for the last month. An odd fellow – something queer in the family.[492] Jenkins also called & sat more than an hour. He has got a second

[485] Plato's famous dialogue on the nature of knowledge, written c. 369 BCE.

[486] An order: a permit to attend debates.

[487] Socratic dialogue on rhetoric and sophistic oratory, written by Plato c. 380 BCE

[488] Cousin's French translation was published in 13 volumes between 1826 and 1856.

[489] Rodolphe Töpffer, 'the father of the comic strip'. *Monsieur Crepin* (Paris, 1839), *Monsieur Vieux Bois* (1837).

[490] A large building on Oxford street, built for entertainments in 1772.

[491] Charles Lamb's 'On the productions of modern art' (1833).

[492] See diary entry for 29 January 1840.

class,[493] which he is, & rightly, very much pleased at. He did not tell much in the way of news.

I could not get out at all.

The Afflecks & Miss Paul came to tea.

20 June
Having finished the Gorgias, I read Schleiermacher's exposition of it & of the Theaetetus,[494] & confess that, whether the fault is the author's or translator's, or my own, I did not make much of it. Read Whewell, & worked on a problem of Booth's. Later in the day, I saw a solution of it, much more simple than his. I am inclined to doubt if his views are, on some points quite distinct.

I walked by myself in the Regent's Park; a very lovely day. I stayed there between two & three hours.

There was nothing in the evening.

21 June
To church; a long & very foolish sermon, about the Queen & Oxford. Afterwards to Wyndham Place for a few minutes. Out in the carriage, in the afternoon, in Hyde & the Regent's Park. A lovely day. Walked in the latter in the evening – a crowd waiting to see the Queen who was not to be seen for a reason as conclusive as the Governor's in the Critic. Read one of the Pickwick papers & Whewell on Morphology &c.[495]

22 June
Read Whewell, wrote something on probability. It is odd, how much the effort of composition distresses me. Saw Chambers. Went out with my father who was however obliged immediately to go back. I walked in the park till six. The Afflecks dined with us; Miss Paul was late. They were going to a party. Mrs Collingwood & two daughters came to tea – a very odd trio. Mrs Johnstone is recently dead. A laborious evening. Mrs Hume has asked Penelope & me for Thursday.

A very fine day.

23 June
Affleck & I made an arrangement to ride yesterday, & went out at 11 this morning. We went to Golders Green, & turned off between it & Hendon into a lane which took us to the Edgware road, by which we came home between one & two.

I stayed at home & read some time; then took a walk for an hour by myself. Saw Mrs Chambers while I was out.

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[493] In a college examination.

[494] *Schleiermacher's Introductions to the Dialogues of Plato* (1836), translated from the German by William Dobson.

[495] Whewell, *Philosophy of the Inductive Sciences*, Book 7.

This day four years ago I was introduced to Alexander Falconer's Oxford brother, & he predicted I should take a good degree, I believe because I abused Oxford mathematics.[496] Two years, I rode over to Freshford, praeteritos si Jupiter annos [if only Jupiter would give me back the years that are pass].[497]

24 June
Read as usual: Pritchard's Origin of the Celts, to which I do not much take.[498] I heard from Gregory. He mentions his & Walton's having received copies of Booth's book, & says his estimate of it coincides with mine. He says he has been struck in Whewell's book with the difference of Whewell's present & old views about the laws of motion, & with the curiously close coincidence, by which I too was surprized, of some of his present notions on the first law of motion with views I have often expressed, e.g. that time cannot be a cause, because time is the condition of existence of causes, & asks if I have been speaking to Whewell upon the subject. I have not, but have often sported the idea in examinations. I caught the germ of it, viz. Kant's view of time & space, from Logan a long time ago. Curious if I made my fortune with Whewell from so casual an advantage.[499]

Walked by myself towards Hampstead. They are making hay there; called on Mr De Symons. A lovely day.

The Afflecks, Mr & Miss Paul dined with us. Mr Paul a 'jovial person', which is not a sort of thing I like at all.

25 June
I read the same book as yesterday & some other things, and at three went to ride with Affleck. The day however was so threatening that we gave it up, & walked instead towards Hampstead. It did not rain, but was cold & windy.

Penelope & I went to the Humes in the evening. There were some twenty people there, a good many of them relations. Some music & a quadrille. Miss Ella Hume to whom I talked for some time, is a very good little radical. It gives her individuality, but is not altogether becoming. Joseph Hume her father came in late from the house, & incontinently addressed me on the subject of sugar.

26 June
A letter from Forbes: only some ex[amination] papers he has been setting at Durham; & one from Napier, marked 'confidential', and which is confidential after the fashion of the child's 'I know something, but I am not to tell'; but the upshot is, that he thinks my chance at Bath so much improved, as to make it worth while to try.

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[496] William Falconer (Oriel 1819), Fellow 1827–39, mathematical lecturer 1827.

[497] 'O mihi referat praeteritos si Iuppiter annos': Virgil, *Aeneid* 8.560.

[498] James Pritchard, *The Eastern Origins of the Celtic Nations* (1831).

[499] See Verburgt's chapter in the present volume for the Logan-Ellis-Whewell connection regarding Kantian views on time and space.

Hobhouse has been doing something, I conjecture, or Roebuck feels weaker than he did. But I am completely in the dark. I wrote an […]

[**10 November 1843–25 January 1844**
TCL, Add.Ms.a.218/41]

10 November 1843
The letters for which I had written came from the Club. One was from Coutts,[500] another from Tom Murray of Coleraine.[501] There was a newspaper from Guernsey containing an account of Napier's row with the Royal court: also an envelope containing two numbers of Col. de Haviland's book, and directed by Emily Napier.[502] I went, half breakfasted, to the schools, sat there three mortal hours: the men were at work on my Euclid paper. Then to my rooms until hall, trying to work and unable. I, in the vulgar phrase, snubbed very harsh for being as I conceived uncivil to Taylor – extreme folly I admit, but I was out of sorts. Walton came in after hall. To a party in Lodge, the best I have seen there. A. Hope and Lady Mildred[503] are staying in the house. Talked to Thurtell.[504] I was struck by the sensibility and kindliness of nature he shewed.

11 November
Breakfast at Blakesley's to meet the Hopes. Lady Mildred was suffering from toothache, au reste nothing remarkable. There were there J.M. Heath, Merivale[505] of St John's, one of the Kennedys,[506] Phelps & so on. Afterwards took a turn with Sedgwick.[507] I suspect he like the rest of them, of us I should say, could preach in earnest on the text 'It is not good for man to be alone'. For the most part, a college is a collection of vies manquées [missing lives]. Read over the Euclid papers – plucked three out of twelve. Knox and Mate came to me in the evening and sat late. The former goes away on Monday. We were talking of ghosts &c. He was much moved. I mean he was very 'eerie' and gave us to understand, he had undergone the visitation of a spectral apparition, and had suffered much from it. He is no believer in the reality of these things. I asked him what he knew of Shelley's views on such matters. He said not much, but that Mrs Shelley had told him Shelley would come to her for refuge from frightful sights terror stricken and half wild.

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[500] A private bank.

[501] Probably one of the Irish tenants inherited by Ellis from his father, who had died in 1842.

[502] Thomas F. De Haviland, *Some Remarks on the Constitution of Guernsey, one of the Channel Island, formerly a part of the Duchy of Normandy* (1847).

[503] Alexander Hope, Trinity 1837; B.A. 1841; later Beresford-Hope. In 1842, he had married Lady Mildred Cecil, daughter of the Marquess of Salisbury.

[504] Alexander Thurtell, Trinity 1825; B.A. 1829 (4W); Fellow of Caius, 1830–49; Tutor, 1836–46.

[505] Charles Merivale (1808–1893), St John's 1826; B.A. 1830 (Fourth Classic); Dean of Ely, 1869–93.

[506] Several Kennedy brothers were at St John's.

[507] Adam Sedgwick (1785–1873), Trinity 1806; B.A. 1808 (5W); Woodwardian Professor of Geology, 1818–73.

12 November
Went to St Mary's early. Heard not more than a few sentences of the sermon. Wrote a note of thanks to Potts[508] for sending me two copies of his wife's verses on the queen's visit and left it at his house. Passed the evening at Mate's with Cope.

13 November
At the schools till twelve and walked a little. After chapel the examiners moderators & proctors met in my rooms. I gave them coffee and we made the list out. A man who was plucked came to me afterwards to know how it had come to pass. O'Brien he had already seen who referred him to me. Honestly, I could not tell him. He passed in my papers and I am too deaf to have been able to follow entirely the marking out of the list. So I sent him on to Colenso[509] who acted as secretary. Poor devil – he haunted me all the evening. A fine looking man, but so subdued, & with the fatal note in his hand, all chafed & bruised. Rooke of Magd[alene].[510]

14 November
A quiet day. I worked at my problem paper, and wrote to Knox and De Morgan.[511] Yesterday to James Connor of Clinura and Mr H. Ellis. I did not get out until late. Goodwin called on me. Saw Walton. He has heard from Gregory but no news. Dined at the lodge. Hallam the historian there. A fine forehead, and manner sometimes reminding me of Ph. Duncan but less kindly and more nervous. Rapid in enunciation but not in reality. He seemed now and then as if he would neither finish his own sentence, nor let anyone else finish his. Gave me no hint of what the communication was to be about [*part of page cut out*]

[…] latter a little affected like himself. Joyce wont to say he had seen wives whom he wished his ideal wife perfectly to resemble, but no girl who would make such a wife. My view is just the reverse. Matrons make the cold reality too real: the old history of the little pigs.

15 November
Lectured; went to the Senate House about being nominated to the Observatory syndicate. Found I might as well have stayed away, and so as it was very cold, I left them, and returned to my rooms. Slept before the fire for an hour. Mate woke me by coming in. He stayed some time. Afterwards came in Walton. I was to have gone to a party at Hopkins's but charged Mate with my excuse. He was with me until nine, talking of old times.

[508] Robert Potts (1802/4–1885), Trinity 1827; B.A. 1832 (26W). A well-known mathematical coach.

[509] John Colenso (1814–1883), St John's College, Cambridge 1832; B.A. 1836 (2W); first bishop of Natal 1855, prosecuted for heresy in 1863.

[510] Charles Rooke, Magdalene 1839), did not graduate. Captain in Suffolk militia 1846.

[511] Augustus De Morgan (1806–1871), Trinity 1823; B.A. 1827 (4W); Professor of Mathematics at London University (later University College London).

16 November
Wrote part of the long planned paper on the method of least squares.[512] Mate came in, with whom I went to Magdalene and there parted. I found Frank civil and ready, and as far as I could settled matters with him. Afterwards walked with Taylor.
[*part of page cut out*]

She is like Mrs Rich. Napier also the Challises. Clarks[513] and Cummings. Donaldson said once of Mrs Clark she was a person who would put a knife into any one who displeased her. She is not ill looking, rather a hard face perhaps. So has the professor. I heard some time since that he followed the man whom he afterwards shot from place to place for several months; dogged him over half the continent until he came up with him & killed him. The poetical justice of a place like this of course added that he had never had a quiet mind since. No doubt there was great provocation but as the injury was irreparable a wise man would have cooled in less time.

17 November
Lectured. I had an odd letter from some attorneys, apparently Barber and Bircham, saying that having been informed that I was the representative of the late Francis Ellis of Bath, they wished I would call on them, as they had a communication to make relating to his affairs. The letter was addressed to C. Terrace. There seemed to me something louche about the business as they gave me no hint as to what the communication was to be about. Also a letter from De Morgan, a very quaint one certainly. Saw and half settled with Frank's gyp and bedmaker. The gyp a 'decent' fellow enough, the bedmaker disagreeable to deal with as most women are. Paid Frank's bill, £184 odd. I am now about £300 out of book, in the vulgar phrase, by the administration, and without any very clear idea as to when I shall be paid. The gyp brought up the books etc, amongst which I found some bills, ten to twelve pounds. A little Virgil which I used to have was one of the books, scribbled with the scribblings I used to be fond of. Thinking of all the deaths and changes since I last had the book before, I tried the sortes, and got 'Infelix cui te exitio fortuna reservat' ['O unlucky race! What end has Fate in store for you?'].[514] Odd.

Thurtell dined in hall and came to me afterwards. A thoroughly sound healthy man. He talked freely and let out much of his own character – a man with strong animal energy, a vigorous mind, no great sympathy with 'the sorrows of my lord Plumcake',[515] with kind feelings despite the little dash of hardness which a practical man either has or to a dreamy person seems to have. Venit puellis nuper idoneus [I

[512] The paper designed to give a refutation of Ivory's proof.

[513] William Clark (1788–1869), Trinity 1803; B.A. 1808; Professor of Anatomy, 1817–66. He had married Mary Willis in 1827.

[514] 'O gens infelix, cui te fortuna reservat?': Virgil, *Aeneid* 5.625.

[515] A character in Mrs Edgeworth's *Helen, A Tale* (1834).

used to be liked by girls][516] [*text scribbled over*]; so much he confessed and perhaps might have said more. But he was so far at least discreet.

18 November
Wrote part of the paper already mentioned & a letter or two. I went out for a few minutes before hall. Afterwards did very little. Mate came to me in the evening.

19 November
The sacrament in our chapel. Towards Grantchester with Mate. Read H. Coleridge's poems.[517] Some sonnets show much poetical feeling, & power of introspection. The tone of the whole that of a man qui a manqué sa vie: which is probably the case. Walton in the evening. Martineau[518] in chapel said Craufurd had heard from Gregory he did not expect to live over Xmas. I should think him a man not to say so without just grounds, for he is neither fanciful nor I imagine timid.

20 November
Got to witness my execution of a power of attorney to H Ellis to collect rents. He has gone on so long without it, I do not know why he should want it now: but so it is. Lectured. Saw Romilly and O'Brien about the previous Ex[amination]. The former said of Hildyard[519] he is the most crotchety man in the world except Smith of Caius[520] – mind you follow no advice of either's and then you have a chance of being right. Wrote to Maria James Ford Fanny Eagles and H. Ellis. Walked with Mate. Taylor busy painting the beauty he picked up at the menagerie the other day: would not show his sketch, but said I might come and see the original.[521] He has marvellous facility of admiration, so that I might very probably be disappointed. Except for the 'consul's daughter', I have not been smitten for an indefinite time, any thing to the contrary notwithstanding.[522]

21 November
Unwell today. Saw Sudbury, who confirmed what everyone says of the unhealthiness of the season. Idled all day, being unfit for any thing. Walton came in; he has a strange mind certainly and an odd way of proving theorems in human nature, e.g. that sorrow impairs the 'logical faculty' by narratives about people

[516] 'Veni puellis nuper idoneus/et militavi non *sine* gloria' ('I used to be liked by girls, and was quite good as s soldier'): Horace, *Odes* 3.26.

[517] Hartley Coleridge. *Poems* (1833).

[518] Alfred Martineau (Trinity College, Cambridge 1836); B.A. 1841; Fellow 1843.

[519] James Hildyard (1809–1887), Christ's College, Cambridge 1829; B.A. 1833 Second Classic). A contentious don who tried to block the appointment of an Examiner in 1842 and was himself blocked in 1844.

[520] See the diary entry for 11 December 1839.

[521] It appears that Tom Taylor, a keen amateur artist, persuaded the local beauties to pose for him.

[522] Presumably one of Taylor's portraits.

which are *ouden pros to Dionuson* [nothing to do with Dionysus].[523] As for instance in the particular case I have mentioned, he gave me a long account of some scamp he met at Boulogne, who lived upon so much a week, said he had been at Waterloo, was dead shot and in the habit of sleeping under haystacks when he went out shooting. Letter no.2 from B & B, a renewed invitation to visit them. I strongly suspect this is michin malicho:[524] some kind of experimental action on a bond or note of hand. Because 1st my father was much too careful, and in too easy circumstances, to leave any claim unsatisfied. 2nd any transaction beyond a mere tradesman's bill, has since he had been described as of the Royal Crescent Bath passed through the Baxendalls, and application has of course been made to them to know who was his personal representative. Business which in all probability originated since /26 does not in ordinary course start up in this abrupt manner. 3rd the anxiety for an interview indicates that I was to be shown certain documents and abruptly asked to recognise their validity, a common device in such cases. I sent both letters to Upton, desiring him to see how the land lay, as well as he could. Assuming I am right I my conjecture, I have quite made up my mind to fight the battle out.

22 November
Another day like yesterday. Settled the previous Ex[amination] paper with O'Brien who came in the evening. Saw Mate.

23 November
Better. Wrote on probabilities. Upton wrote to say Barber was to call on him. Martineau called and Grote[525] who has been ill. He was in Edinburgh. Saw Gregory, and gives rather a more hopeful account of him.

24 November
Again better. Wrote a letter or two, settled some papers. Sent for one of my class and gave him a screed of doctrine. Crowfoot called and sat some time – a good fellow. Mate I saw in the evening and Taylor who has not satisfied himself in painting the girl I mentioned. I am not much surprized thereat. He told me people in general took his portrait of me for a copy of an old picture: judging from the 17th century collar he has given me, and indeed the stern calm look [it] would do very tolerably for a puritan. I think it is like, but the expression is at least exaggerated.[526]

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[523] A Greek proverb perhaps related to the move away from dramatic events focused on Dionysus to the wider range of subjects treated by the Greek tragedians. Ellis's point is that Gregory's alleged evidence is not relevant to his case.

[524] Sneaking mischief: best known from its use in Shakespeare, *Hamlet* Act 3 Scene 2.

[525] John Grote (1813–1866), Trinity College, Cambridge 1833; B.A. 1831 (First Class Classics); Fellow 1837; Knightbridge Professor of Moral Philosophy, 1855–66; Ellis's closest friend in his later years.

[526] This is one of several portraits of Ellis mentioned in his diaries, none of which have survived.

25 November
Against Sudbury's[527] advice forth I went to the Senate House, having borrowed he master's fly and I believe the master's man to draw it. However that may be, to the Senate House I went in this uncouth equipage, with people looking at me considerably. As Walton would say, it was all over but shouting, nearly all the men were gone. O'Brien himself was gone, but returned. I stayed until the last gave in his papers – who should he be but Hamilton[528] of Pembroke, now of Caius, who should have gone out nearly two years ago. I got more of the papers and looked over a dozen or two. Thurtell called, said Hamilton was unprofitable. He was one of the most disagreeable swaggerers I have encountered but seems subdued now.

26 November
Read idly; annoyed at not hearing from Upton about his interview with Barber. I confess the thing teases me au tant soit peu. Saw Crowfoot and Mate: did not get out.

27 November
Mate persuaded me to go out, as the day was very fine. As I was going to my rooms Marsh of Trinity Hall, and now father there, came up to me to enquire about Matcham of that ilk, plucked the other day. I gave him what information I could. Then came O'Brien; he set all the papers in order. I rejected two men, he one. A curious things occurred about this one. O'Brien made each man, whom on conversation he found duly prepared sign his name and go forth without farther examination. He showed me today the list of signatures and I at once recognised the man he had rejected as one of those he had passed as not needing examination. I hope and believe we were right in taking the authority of the list as against that of the papers, which were probably what he had done before O'Brien spoke to him and amounted to very little. I gave an examination in my rooms today. Three men came. It was by way of doing something and was something.

28 November
No letter from Upton. One from Barber saying he will wait until I am in town. So he has backed out of his visit to Upton. I will wait until I hear from Upton about it. Everything confirms my first impression. Began an analysis of the subjects in the Senate House examination. Wrote a good deal on probabilities.

Read some of Gray's life. Walked by myself: a most lovely day. Saw Sudbury: I do not improve rapidly, and am somewhat inclined to be bluedevilled. Libera me. Sent for Grant and Blackburn.

[527] Ellis's doctor.

[528] Arthur Hamilton, Pembroke 1839, migrated to Caius 1841; B.A. 1843.

29 November
Upton wrote to say Barber had not kept his promise; which I knew, and that he was inclined to stir himself up by a visit. I had also letters from Coates and Ellis. Took a turn with Mate. Met Blakesley, [who] asked me if I would go on lecturing next term. I said I could not decide now, but that I felt less disinclined than I did at first. An answer which binds to nothing.

The truth is, I find Cambridge much less pleasant than when I had more friends here, say last May or this time two years ago. On the other hand as February draws near I ask myself where in the wide world I can be unless here or where I often am more uncomfortable than here. What Kilbee coarsely told me was true, 'That won't last long', meaning my going about, soon won't be the welcome guest you were. Quite true: added to which I have no taste for going about. Mais que faire? It answered the purpose at the time: ma vie est manquée that's the truth of it. No one but a something too much of this.

30 November
I had looked for a letter from Upton; none came but one from Penelope which I let lie a while, thinking there could be nothing in it contained. What surprized me as much as anything he could have told me: news that Maria expects to be confined in March. It had never occurred to me or anyone else as a possibility. I have been ordering matters about at Clinura and Ballybay: giving James Connor[529] two years rent subscribing to the hospital & so on, and now it is something like an equal chance whether I have any part or lot in the matter. I could not help laughing at myself as I should have done at anyone else, so 'done'. I doubt if it is quite handsome of Maria, but I suppose it cannot be helped. Penelope asks, 'Am I wrong in not being glad?', a casuistical question which applies to me also, and which as I cannot answer, I am disposed to put by treating the matter as lightly as may be. I think I know one person who is a friend of mine after a fashion, who will be right glad at what looks like a disappointment or mortification to me, or to anyone else, indeed one of the curious turns of human nature.

It is so hard for a man to know his own feelings except where he has the testimony of actions to appeal to, that it is some satisfaction to me to know that I have shown that money does not affect me much. I do not speak of what I have given away, but of what I have passed by. One word would have given me, would probably yet give me something like twice the fee simple of the lands in question. Why was it not said? Why not, why not, except that it seems my destiny to be all compact of half impulses and imperfect emotions, to be rocked by every wave, on the shore of the great sea on which I dare not put out. So has it been ever, here for instance where though I had a motive which has now gone down into the grave, I yet went stumbling on from one piece of good fortune, with no definite ambition, & there-

[529] One of Ellis's Irish tenants.

fore without the satisfaction which attends hopeful and successful efforts. But to return whatever the reason was argument of my weakness, whatever it me be, at least it may serve to prove that for which I have adduced it. Taylor brought me a paper to set questions from for a lad who wants a certificate of his acquaintance with algebra from someone with a status here. I examine him and was satisfied. His name is Cunningham. He seems to know what he is about a great deal better than some of us in this place. He is going I believe to Sandhurst or some similar establishment.

1 December 1843
Lectured. Out by myself on the London road. Wrote to Barber and Bircham. We have been practising carte & tierce for some time with no result.[530] Read and idled. In the evening there was a preliminary meeting of the examiners in my rooms. I had made an analysis of four years' examinations, of which much was made. I however found it so inaccurate that when Goodwin left me at eleven I went to work and reproduced a considerable portion of it afresh which I sent to O'Brien. I consequently was up until two.

2 December
It was arranged that each examiner should bring a certain number of questions on certain fixed subjects. Mine are Euclid, Diff[erential] Calculus, Hydrostatics and Physical Optics. I began on Hydrostatics. There came in the Sidney man whom we had disqualified for honours & whose case was precisely similar to the Magdalene man already mentioned only it was not detected in time.[531] I was marvellously civil to him & to set him right in his college gave him an apologetical note to take to his praelector. Afterwards came in a Trinity man who from some change in his plans wished to go out in honours; I told him I should make no difficulty about it, but would examine him quietly whenever he would come to me to and give him advice on his plans. He seems to have a due horror of being plucked. Business done. He claimed a kind of acquaintance as being an ex pupil of Johnstone, of whom we had some talk. People turn up in a very odd way, occasionally. This man seems of my standing, and has been at Oxford. Johnston is married to his brother's wife's sister: there was a *husteron proteron* [a later coming earlier][532] in the case which has shocked his patron and cost him pupils.

Today came the solution of Barber's mystery: he has a vision of property real and personal under £5000 which is vague, recoverable and wants say £10 per cent for giving me information, or more for he has a client round the corner, like Sarah

[530] A fencing term: 'parrying'.

[531] Not identified.

[532] Perhaps an illegitimate birth.

Gamp's Mrs Harris.[533] No class of people are worse to deal with than principals who affect to be agents. I wrote to Upton that £10 per cent was the outside, that I should not be bound to proceed if I did not like the case, nor prevented from compromising at any stage. It is very possibly, if not altogether a dream, a hard case in which I should not act for my own benefit, and certainly will not for Barber's.

3 December
Letters from my mother enclosing one from [Maria?], whom she has been [illegible] apparently with making a mystery of her state; a charge not altogether without foundation. But probably the state of her health tended to obscure some of the common indications. Thurtell sat with me an hour or so. One of the men who leave you comforted and strengthened: why it is difficult to say. H. Ellis, never a sanguine or hopeful man, had uniformly the same influence with me. He is a fine 'plucky' and straightforward man, which I suppose is partly the cause. For the rest, I believe it is to be found in his practical faith in truth and honesty. A man may be honest and want this: may stop at 'magna est veritas' ['great is the truth'] without adding 'et praevalebit' ['and it shall prevail']. Walked with Walton.

4 December
Lectured. Towards Grantchester with Mate: a very fine day. Mathison overtook and joined us.

5 December
Mild and wet: with Taylor most of the afternoon. He is busy painting the menagerie beauty, who is rather a menagerie beauty. By myself all the evening: I do not know why one dislikes solitude: I do though I have lived more in painful society than most people of my standing. There is certainly a gregarious instinct in man: but beyond this I think in some way not clearly understood the presence of another person, & occasional communication, influences beneficially the course of reflection: chases away thick coming fancies. To use too much used words it makes the current of ideas more objective, and subjective thought tends to become unhealthy. Thus it is that when the mind is striving against its own imaginations and so to speak the fate of Actaeon, people are apt to talk to themselves and so on.[534] 'When by herself', as Coleridge said, 'She to herself must sing some merry rhyme'.[535]

[533] Sarah Gamp, an alcoholic midwife in Dickens' *Martin Chuzzlewit*, constantly refers to 'Mrs Harris', a friend who does not actually exist.

[534] Actaeon, a Greek hero, surprised the goddess Artemis bathing, and was turned by her into a stag.

[535] S.T. Coleridge, 'The three graves' (1809).

6 December
Meeting of observatory syndicate. Chapman there, very deaf, Miller, Cookson &c. Also Chapman's nieces. After came a brood of D'Aquilas. We all returned to Cambridge together, and Mrs Challis came to my rooms: incorrect rather, but it was not my affair.

In the evening meeting of moderators and examiners: a good deal done. Rayner[536] not brilliant.

7 December
Too wet for me to go out. Last night came the list of candidate for honours: about 23 were not in the Senate House on the 25th. I went through the lists last night to ascertain this and today O'Brien came and went through them again and agreed what as to be done. Afterwards I repeated with Mate's assistance the scrutiny and sent the list to the praelectors. The defaulters belong entirely to this college and St John's.

8 December
A characteristic return from Hemery our praelector.[537] In less than 12 hours, he had examined the cases, rowed[538] the delinquents and sent them to me. I like these 'rough and ready' men, they are infinitely better to deal with then the accomplished old women of whom we have so many. The cases of default reduced themselves to two, the others not being candidates for honours. Wrote to Joe Hume inviting him to come down here. A very fine day; walked with Mate. Met Blakesley, who is much disfigured by a swelling in the cheek. He is subject to things of the kind: Taylor thinks it is probably right that they are connected with disease of the heart from which he is said to suffer.

[*page cut out*]

[11 December]
[…] came out a will purporting to be that of a person in whose name the stock was standing and who [is] still alive. The will was proved by a client of Barber's and the stock [trans]ferred or more probably sold.

12 December
[Di]vidends paid. My balance £109. Worked a [tr]ansformation in definite integrals brought me by Goodwin and took it to him with Taylor nearly to Madingley, the longest [..chargt?] I have taken for many months, since [the] unwise days of Moulin huit.[539] Certainly [I] find not much comfort in comparing [m]y current

[536] George Reyner, St John's 1835; B.A. 1838 (4W).

[537] James Hemery, Trinity 1833; B.A. 1837; Fellow 1839. The Praelector was in charge of undergraduates sitting aminations and proceeding to a degree.

[538] Rebuked.

[539] A bay on the island of Guernsey, perhaps the location of a reading party.

amount of comfort and health [wi]th what I had last year or [dur]ing my first visit to Ireland.

13 December
[Ex]amining the residue omitted the 25th in [th]e schools. This examination has [be]en a failure: if I were moderator again [I] would not attempt it. The tendency [o]f ideas in the university is more and more to [re]cognize no power of direction or control, [ex]cept in the college: university influence is [co]nfined mainly to the examinations them[se]lves and is not willingly admitted with respect [to] any preliminary exercise. Whewell incepted a D.D. at the second congregation.[540] Challis came to me and worked on my problems. In the evening Mate, who goes down tomorrow. Taylor already gone. I am a regular last case.

14 December
One man nomine Morgan, absent yesterday, came today to be examined. No very good reason for his absence, but I hate being over strict, and examined him. While he was with me came in Thompson of Peterhouse.[541] I said to Morgan, 'You know who that is – he will be senior wrangler next year'. 'Oh yes, to be sure, the man who won the sculls.'[542] A different point of view. To the Observatory. Miss Copsey and Codd of St John's is a decided matrimonial case.[543] 'What a thing time is': she was a perfect child when I was at Papworth, and now not only about to be married, but not as soon as she might have been by two or three years. Pamela Napier was as much a child when I was in the habit of being at Freshford at a later period, but then she is still very young – and so is Popham, and green too.

15 December
Prizes given in our hall. Bristed declaimed on liberality – a lesson needed here. I thought it an odd subject to choose, in a place where there is so much narrow prejudice & the affectation of more than there is. Saw a sketch of Taylor by Fichell at Harridan's. Not good though recognizable.

16 December
At ten, impransus,[544] to the Senate House. Term ended by a Latin prayer. Read Oliver Twist, not edified. There was a meeting of examiners. Wet day.

[540] In other words, was formally given his degree as Doctor of Divinity.

[541] William Thomson (1824–1907), Peterhouse College 1841; B.A. 1845 (2W and First Smith's Prizeman); Professor of Natural Philosophy at the University of Glasgow, 1846–99; knighted 1866, ennobled as Baron Kelvin 1892.

[542] Thomson won the Colquhoun sculls for the university championship in single-seat shell rowing.

[543] See 9 March 1843. Edward Codd, St John's 1835, married James Challis's stepdaughter Sarah Copsey in 1844.

[544] Without having breakfasted.

17 December
A lovely day: walked with Thurtell to Trumpington and Grantchester, the longest walk I have taken for an indefinite time. He was very pleasant and sociable. He said it was a satisfaction to him that he had ceased to believe in saints and heroes, though not in saintship and heroism. A good distinction. I answered with much sincerity that I rejoiced to think that there must be many people much better than I: it must have been some good angel who, hovering about on Sunday morning, inspired so amiable a reflection. I could not say so always – honestly. Thurtell wanted me to come to Caius but I was tired.

18 December
Met O'Brien. His wife has the measles, and so he could not come to a meeting this evening. We met however, sat short time and adjourned. Goodwin stayed with me. He improves on intimacy, as all people do who are not quite natural & yet have good qualities. Saw Hamilton. Got 'Scenes Contemporaines'.[545]

19 December
Another dark day. I spent some time in the university library and looked at B. Constant's Polytheism.[546] Walked with Walton.

20 December
Meeting of examiners at eleven: sat until half past two. Adjourned until half-past six, then on to 11 or nearly so. Had in the interval a discussion with Walton on centrifugal force.

21 December
Today like yesterday, at work all day. A disagreeable report patronized by Colenso[547] that I had said that Newton would pay well this years or words to that effect. It was told me as a pour parler by Rayner.[548] Wrote to Colenso and to Griffin who was mixed up in the matter about it. It is hard that a man so wholly severed as I am from all college intrigues and interests, should be taxed with unfairness, or negligence equivalent to it. The report was utterly absurd, as no one until today knew or could tell whether Newton would be favoured or not.

22 December
Meeting again in the morning. Goodwin is going down for Christmas, so we adjourned until Wednesday. He sent four papers to the press. A dull dark but very mild day. I saw Colenso in the evening: he apologetical rather. A man like John Maitland in some degree. Large inflamed looking restless eyes and hollow cheeks.

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[545] Francois Loève-Weimars, *Scenes contemporaines* (Bruxelles, 1828).

[546] Benjamin Constant, *Du polythéisme romain* (Paris, 1833).

[547] See diary entry for 13 December 1843.

[548] Reyner was one of the Tripos examiners. The implication was that Ellis intended to set questions on Newton's *Principia*.

23 December
A lovely day. At ten to the library – a scramble for books in request, this being the first day on which they could be taken out. I got mine – Chasles's Historical Essay,[549] and B. Constant's Polytheisme, which is a book to make one think. I do not agree with much of it, and doubt if there was not an arrière pensée in the writer's mind. The question of Roman polytheism is avowedly secondary to the more general one of religion. Considered if I may use the expression as a matter of natural history. The principal point, and it is enforced with much ability, is that a religious system of some kind or other is necessary to the healthy development of humanity. But he perpetually touches the edge of another question and never enters on it. Is one system different from another in kind and essence? I mean, is one true and all the rest false? Or are all true in one sense and false in another? True as faithfully reflecting the wants and tendencies of the human mind, and false historically. Towards Grantchester with Walton. Extremely languid. Got a translation of La Motte Fouqué's Two Captains.[550] There seems a peculiar charm about everything he writes: it is not often that so much imagination is connected with a moral tone so pure and high. But the morality of this tale is in several points a mistake. In the first place the virtuous hero would have done much better in not assisting his friend in wantonly disturbing the peace of mind of the unfortunate husband. In the second there are happily a good many people, who though they would not walk across the Sahara to convert a pagan, would yet abstain from compromising a lady by spending the small hours with her in a garden. Lastly a duel without a quarrel or after a reconciliation, there having been no witness to the insult, is a peculiarity worthy only of a German student. Another fault, it was perhaps mine, that I felt: but Juvenal's 'Quis tamen affirmat'[551] &c, or something equivalent, occurred to me more than once with reference to the damsel who lived in the enchanted oasis with a dervish whose notions of right and wrong were probably none the best. A Magdalene[552] may interest you, but you must first know that she is one; the suspicion destroys the reverence with which one should contemplate purity, and substitutes nothing.

24 December
Walton came in about twelve. We walked on the Ely road, and thence round to that which goes to Histon. A lovely day. Saw Potts in our chapel, who enquired of my health; so we are to be friends.

25 December
Sacrament. I had purpose to hear F. Glover preach but my heat failed me. Wrote out my problems. Bristed came in. I rather like him though he is vain & a little American: decidedly clever.

[549] Michel Chasles, *Apercu historique sur l'origine et le developpement des méthodes en géometrie*. (Bruxelles, 1837).

[550] La Motte Fouqué, 'Les deux capitains', in *Undine and Other Tales* (1832).

[551] Juvenal, *Satires* 6.58: 'But who affirms that nothing is done in mountains or in caves?'

[552] Mary Magdalene, not the college named after her.

26 December
Went to O'Brien's about corrections of the press. He has a nice little, not very little either, house on Parkers Piece. There was an air of home comfort about it which contrasts well with college life, & I confess made me think of my own 'cold fireside & alienated home.[553] However, 'on this stage where every man must play his part, and mine a sad one', it will not do to look too much to the right or left. And that after all I love life well may be inferred from the uncomfortable feelings with which the idea of death is associated: though I believe. I shrink much more from 'the flames of the fever and the sorrows of the sickness' than from that which they bring with them; and this I hope not because I am not more timid than others than because constant fluctuations of health and frequent illness have brought these class of ideas more frequently before me.

27 December
Meeting at eleven until two. Saw Walton. At seven O'Brien came to me and at eight the examiners, and we sat until twelve. I did not go to bed until two.

28 December
I met Mrs Challis yesterday who asked me to dine today. I hardly felt inclined to do, and therefore went out there in a fly to say so. Walton had come to my rooms and went there with me and we walked back.

1844

19 January
Knox has come down for his degree. 'Ce jeune homme a de l'avenir' – thinks so at least.[554] There is something in him to be studied and which I do not understand. Fond of the elegancies of life; of no rigid or ascetic morality; a man of irritable fastidiousness; in one phase he seems to be merely an epicurean, whose destiny ought to be to float about, as was his wont not long since, in the waters of Venice in his gondola, & to give to books and pictures all the time that could be spared from society & women. Then again comes regret for lost time & the expression of the conviction that life is nothing but when dedicated to some useful end: a mode of talking which I admit is often an excuse for doing nothing practical & often a reason for mere self seeking. Then again he is the busy student of law, aspiring to be rich and of consideration in society; worldly to the back bone; confident of success, because he desires it strongly, rather than because he seeks it earnestly; lastly something of honest feeling shines out, of affection frank and loyal, of a desire to believe in goodness and purity. No central principle binds into one the moods of his mind; they osculate so to speak, but no more; and his manner which is artificial at all times indicates the absence of earnestness & settled purpose.

At the bar he cannot succeed; he has not forgotten the end in the means; he wants to succeed that he may have a fine house & a handsome wife, & therefore he will fail. Lawyers are not made of filigree.

[553] P.B. Shelley, 'Alastor' (1815–16).

[554] That is, he is full of confidence.

25 January
A just and striking saying of B. Constant, that for the most part men are held from wrongdoing by the consciousness of innocence. Therefore the Stoic paradox omnia peccata paria [all sins are as serious as one another] and the corresponding tenet of many religionists hurt morality. Again the remark shows why the doctrine of the efficiency of repentance is all but necessary to morality: for repentance is supplementary innocence. I am not speaking of any outward evils to be avoided by repentance, and which would produce despair, were no expiation possible: apart from these considerations to have repented is believed and felt to be in fact to have put away one's sin; and therefore more or less of the original abhorrence of it revives. Further, where society has affixed an indelible stain to certain conduct, we seldom see any return to the right course, because the consciousness of innocence is irreparably gone. In minor morals: a man who had never been out of temper with a particular person is under more restraint with that person than with others – a very well known illustration of Constant's principle.

Cardinal de Retz, whose memoirs I have been reading, was not a great man. Capefigue[555] seems to assert that he did not understand the real source of his strength: which is probably a mistake. But having it in his hands to play a great game, he chose to play a little one. Tribune of the people or intrigant: he chose to be the latter. There were many reasons for this choice, but not reasons which a great man would have been determined by. Moreover, he loved intrigue for its own sake, not as a means to great ends, of which indeed he seemed to have none. Therefore notwithstanding all his talent and the great interests involved in the sphere of his activity, there is much of what is vulgarly called fussiness in his own account of his conduct. Bouillon[556] seems to have asserted the superiority of a stronger mind on the occasions on which they were in contact.

[…]

[1845
TCL, Add.Ms.a.221/16]

On the 26th November 1844, I accepted the post of Senior Examiner as O'Brien's deputy.[557] My doing so was preceded by an uncertainty which lasted about ten days as to whether he would himself examine, or be able to find another deputy. Goodwin[558] who acted for him repeatedly pressed me to accept the office. I declined until it was clear that no other satisfactory appointment could be made.

[555] Jean-Baptiste Capefigue (1801–1872, French historian and biographer.

[556] Henri de la Tour d'Auvergne, Duc de Bouillon.

[557] Matthew O'Brien, Caius 1834; B.A. 1838 (3W). O'Brien had been appointed Senior Examiner in November 1844.

[558] Harvey Goodwin, Caius 1835; B.A. 1840 (2W). His third son (Caius 1873) was christened Leslie Ellis Goodwin.

On the 27th the moderators & examiners met. Last year e.g. the first paper by the J.M. & S.E. the second by the S.M & J.E.[559]

To this arrangement Goodwin J.M was willing to adhere. I opposed it, both on the ground of the grace of the senate already mentioned & because by it, as A might read answers to a question proposed by B, he was naturally less familiar with the bearings & intricacies of the subject to which it related.

We therefore returned to the former plan. Setting aside any distinct enactment, much may be said in favour of the relinquished arrangement which originated with O'Brien.

We met again on the 2d December & on the 6th [and] 7th.

These meetings were in the evening. About the middle of the month we began to meet in the forenoon.

On the 23d December the last papers were sent to press.[560] The same day the marking of the first five (bw)[561] papers was completed.

The marking proceeded by subjects according to the subjoined scheme.

I propose the following marks: [List of questions with marks: from analytical geometry to the integral calculus; from mechanics to hydrostatics; optics & astronomy.]

In all 75 questions in 5 papers. Comprizing on Weds. 5h 30m, Thurs 2h 30m, Fri 2h 30m, Sat 3h 00m, [total] 13h 30m. Average 10' 48" a question.

High Papers [list of papers, beginning 'Pure analysis']
[List of questions] Algebra; Geometry to Astronomy; Optics to Heat.

A few days before the examination commenced Stokes J. E.[562] [Junior Examiner] became indisposed, & on the 29th or 30th December it became clear that he could not take part in the earlier portion of the examination. It was proposed that Sykes of Pembroke, 3d wrangler in 1841,[563] should assist Stokes in reading the first afternoon's paper, merely as a friend; then as an assistant recognized by the university; & lastly that he should take his place as Junior Examiner. This course was decided on on the 30th Decr & a notice of a convocation for the 31st was given.

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[559] Senior and Junior Moderators, Senior and Junior Examiners: the four men who set and examined Mathematical Tripos papers.

[560] The questions set for the Mathematical Tripos of 1845 are in *The Cambridge University Calendar for 1845* (Cambridge: J. & J.J Deighton, 1845), 326–45.

[561] Bookwork, that is, the more elementary ('low') papers. Since the examination took place in January, Ellis presumably referred to the allocation of marks to questions.

[562] Junior Examiner; George Gabriel Stokes.

[563] John Sykes, Pembroke 1837.

There was some trouble in making a convocation as 40 members of the Senate were required. However we got nearly 50: the congregation was formed out of the convocation,[564] & a grace was passed, appointing Sykes J. Examr.

The whole case was anomalous: the papers having been already printed off, so that a chief part of an Examiner's duty was already done. Moreover Sykes had seven pupils going out in honours.[565] He had hoped that Stokes would be able to assist towards the end of the examination. This however now seems impossible.

[List of papers in order of sitting]

[Problem papers:[566] full text of questions]

[564] Congregation: a meeting of the Senate called to transact formal business; convocation: a meeting called out of term, which could then transform itself into a congregation.

[565] To avoid favouritism, those appointed as examiners were not allowed to act as private tutors to candidates for the Tripos.

[566] As opposed to 'bookwork': the more challenging papers.

Letters

Note to the Reader

Lukas M. Verburgt & Christopher Stray

A few preliminary remarks about the following annotated selection of Robert Leslie Ellis's correspondence.

First, the letters are first grouped by correspondents and then, as far as possible, by chronology. The main value of this arrangement is that it allows Ellis's (personal or professional) intimacy with or distance from a correspondent to emerge; this would not be the case if the series were broken up. Ellis's extant correspondence is rather unevenly distributed over correspondents and, by implication, over topics. For example, there are some 200 letters to his sister (Lady Affleck), dealing mostly with trivialities of Cambridge life, and about 30 letters to William Thomson (Lord Kelvin), which primarily discuss editorial matters related to the *Cambridge Mathematical Journal*. By contrast, there are only two letters to James Spedding, Ellis's fellow editor of *The Works of Francis Bacon*, and a dozen substantial letters to William Whewell, his unofficial philosophical mentor. Hence, also since almost only outgoing letters have survived, Ellis's correspondence does not allow for a detailed reconstruction of his intellectual development and/or scholarly collaborations. The central aim in selecting and arranging the letters has instead been to provide a balanced selection of Ellis's correspondence, capturing his scholarly activities, inner torments and long struggle with illness in the 1840s-50s.

Second, at the end of the selection of Ellis's correspondence, a separate section has been added, containing letters exchanged between Ellis's circle touching on matters related to his death.

L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0

Third, each correspondent is briefly introduced and each letter is preceded by its manuscript number, sender and recipient and, where possible, date and place of composition.

Fourth, as before, the abbreviations for libraries and archives are as follows: Trinity College Library, Cambridge (Whewell Papers) (TCL), Cambridge University Library (CUL) and St. Andrews University Library Special Collections (Papers of James David Forbes) (SAUL).[1]

For editorial method, see the 'Note to the Reader' preceding the diaries.

[1] The archive of the Society for the Diffusion of Useful Knowledge, held at University College London, Special Collections, but temporarily housed at the National Archives (Kew), contains an entry of 'Robert Ellis' (5 letters), dated 1839–44 (SDUK/18-48). It is very likely that this 'Robert Ellis' is Robert Leslie Ellis, the occasion possibly being an invitation to contribute to the *Penny Cyclopaedia*. We are thankful to Stephen Stigler for bringing these letters to our attention. For various practical reasons, we have not been able to consult the letters in time for (a selection of) them to be included in the present volume.

List of Selected Letters

Francis Ellis

Francis Ellis to Robert Leslie Ellis, 26 November 1838
Robert Leslie Ellis to Francis Ellis, 16 July 1840

James David Forbes

Robert Leslie Ellis to James D. Forbes, 23 January 1835
Robert Leslie Ellis to James D. Forbes, 9 May 1835
James D. Forbes to Robert Leslie Ellis, 14 February 1836
Robert Leslie Ellis to James D. Forbes, 23 August 1836
Robert Leslie Ellis to James D. Forbes, 3 October 1841
Robert Leslie Ellis to James D. Forbes, 10 November 1841
Robert Leslie Ellis to James D. Forbes, 27 May 1842
Robert Leslie Ellis to James D. Forbes, 17 November 1844

William Thomson (Lord Kelvin)

Robert Leslie Ellis to William Thomson, (?) February 1845
Robert Leslie Ellis to William Thomson, 20 February 1845
Robert Leslie Ellis to William Thomson, 13 June 1845
Robert Leslie Ellis to William Thomson, 30 June 1845
Robert Leslie Ellis to William Thomson, 17 July 1845
Robert Leslie Ellis to William Thomson, 24 July 1845
Robert Leslie Ellis to William Thomson, 26 July 1845
Robert Leslie Ellis to James Thomson, 11 May 1846
Robert Leslie Ellis to William Thomson, 20 October 1846
Robert Leslie Ellis to William Thomson, 15 January 1849
Robert Leslie Ellis to William Thomson, 29 January (1849/50?)
Robert Leslie Ellis to William Thomson, 4 September (1849/50?)

Arthur Cayley

Robert Leslie Ellis to Arthur Cayley, 26 February 1847

Duncan Farquharson Gregory

Robert Leslie Ellis to Duncan Farquharson Gregory, undated but from 1842/3

Archibald Smith

Robert Leslie Ellis to Archibald Smith, 3 September 1850

Augustus De Morgan

Augustus De Morgan to Robert Leslie Ellis, 24 June 1854

William Whewell

Robert Leslie Ellis to William Whewell, 22 January 18(42?)
Robert Leslie Ellis to William Whewell, 11 October (probably 1848/49)
Robert Leslie Ellis to William Whewell, 8 August (probably 1849)
Robert Leslie Ellis to William Whewell, (probably late 1840s)
Robert Leslie Ellis to Wiliam Whewell but possibly to Joseph Edleston, undated but from before 1850
Robert Leslie Ellis to William Whewell, 26 April 1858
William Whewell to Robert Leslie Ellis, 29 March (probably from 1858)

John Grote

Robert Leslie Ellis to John Grote, 25 August (?)
Robert Leslie Ellis to John Grote, 6 April (from before 1849)
Robert Leslie Ellis to John Grote, 26 January 1850
Robert Leslie Ellis to John Grote, 12 February 1850
Robert Leslie Ellis to John Grote, 2 March 1850
Robert Leslie Ellis to John Grote, 14 November 1850
Robert Leslie Ellis to John Grote, (1?) January 1851
Robert Leslie Ellis to John Grote, 23 January 1851
Robert Leslie Ellis to John Grote, 4 September (1851?)
Robert Leslie Ellis to John Grote, undated but probably from 1851/2
Robert Leslie Ellis to John Grote, undated, but probably from after 1851
Robert Leslie Ellis to John Grote, undated, but probably from after 1853

William Walton

Robert Leslie Ellis to William Walton, 5 August 1847
Robert Leslie Ellis to William Walton, 29 October (probably late-1848/49)
Robert Leslie Ellis to William Walton, undated, but probably from (early) 1849
Robert Leslie Ellis to William Walton, 26 November 1849
Robert Leslie Ellis to William Walton, undated, but from 1849/50
Robert Leslie Ellis to William Walton, 2 January 1850

Robert Leslie Ellis to William Walton, 22 January 1850
Robert Leslie Ellis to William Walton, 4 February 1850
Robert Leslie Ellis to William Walton, 17 February 1850
Robert Leslie Ellis to William Walton, Good Friday 1850
Robert Leslie Ellis to William Walton, 6 September (probably from 1850)
Robert Leslie Ellis to William Walton, 13 December (probably from 1850/1)
Robert Leslie Ellis to William Walton, undated, but probably from the early-1850s
Robert Leslie Ellis to William Walton, undated, but probably from the late-1850s
Robert Leslie Ellis to William Walton, 24 September 1857
Robert Leslie Ellis to William Walton, 18 November (1857/8?)
Robert Leslie Ellis to William Walton, 24 December 1858
Robert Leslie Ellis to William Walton, 22 February 1859
Robert Leslie Ellis to William Walton, 31 March 1859

'Mrs Walton'

Robert Leslie Ellis to Mrs Walton, (?) 1851

Correspondence relating to Ellis's death

Harvey Goodwin

Harvey Goodwin to William Whewell, 16/7 May 1859
Lady Everine Frances (née Ellis)
William Hopkins to Lady Affleck, 10 April 1861
William Walton to Lady Affleck, 8 August 1863

James Spedding

James Spedding to William Whewell, 16 May 1859
James Spedding to Harvey Goodwin, 7 December 1863

Selected letters

FRANCIS ELLIS (1772–1842), father of Robert Leslie Ellis, who was the youngest of his six children with Mary Ellis (née Kilbee) (1777–1847). A well-known figure in Bath, where he was one of the founders of the Bath Literary and Scientific Institution. He played an active role in his son's education and was himself a studious man; a Fellow of the Royal Astronomical Society, he published two scientific papers, 'On the propagation of sound through unelastic fluids' (1810) and 'On a lamp without flame' (1818). His death on 10 May 1842 was 'the greatest grief' of Ellis's life.

[TCL, Add.Ms.c.67/4
Robert Leslie Ellis to Francis Ellis
26 November 1838]

My dear father,

Although you mentioned Tuesday or Wednesday for my writing, you will not I hope object to receiving me a day earlier – yet I have very little to say.

You ask about the whisker quarrel, there has been no lack of verses about it, much of the same quality as the chapel squibs.[2] On Friday, there was an [sic] Union meeting on the subject of the resignation – I was there – the crowd & tumult were tremendous – nearly four hundred gownsmen, on a moderate computation.[3] Stokes & Frere have got a great deal of notoriety & but for their being two very silly fellows might be great men. Frere behaved very ill.

Did you ever try the experiment of shaking an egg to make it stand on end? A more recondite plan than Columbus's, but not so sure of success. At Gooden's, it was tried, & the result was that the egg was broken & a great defilement, which I use as an elegant synonyme [sic] for mess produced. I suspect the thing is not true.

This is terribly sharp weather – today has been very bitter – I do not know what the thermometer is at. It is not likely that this weather will last at this time of year. Penelope wrote to me the other day by the Pauls, who returned by Cambridge to Finedon. The letter came in the evening from Christ's. The Pauls have a friend there.

I suppose Joyce is on his travels as I have heard nothing either of or from him – I shall write to Sam Barrow in a day or two. The first draught of the declamation is done, written at two sittings, about five hours in all. As it is pretty long, you will see that it must want revision. I have read it to Gooden – he says it has too much matter, & is too difficult – this is true – quasi a declamation. I would rather write what

[2] The whiskers of Charles Stokes (Trinity 1836) were cut off by Temple Frere (Downing 1835, Trinity 1835) while Stokes was asleep. This led to what Ellis in his diary for 20 November 1838 called 'an absurd quarrel'. Two pamphlets were published on the quarrel: the anonymous *Fuzwhiskiana. Dedicated to the Shaven, Shorn, and Whiskerless*, and *The Rape of the Whisker: An Heroic Poem* (also anonymous, but by Charles Tindal). See M-C. Newbould, "*The Rape of the Whisker* and *Fuzwhiskiana*: regrooming Pope's *Rape of the Lock* in early nineteenth-century Cambridge," *Philological Quarterly* 95 (2016): 125–45.

[3] Temple Frere was secretary of the Cambridge Union Society, and faced a proposal to sack him because of his tonsorial assault on Stokes.

would show that I understand & have thought upon a difficult & important subject (I have introduced a paragraph on the authority of induction &c) than the flimsy things which get prizes. If Carus, who is the judge, understands my declamation, he is more of a philosopher than I take him for. Peacock will however probably take the trouble of reading and I write with a view to this.

Give my love to my dear mother.

Yours most affectionately

R. Leslie Ellis

[TCL, Add.Ms.c.67.5
Robert Leslie Ellis to Francis Ellis
16 July 1840]

16 July 1840, Trinity

My dear father,

I am you will see senior wrangler, & Archibald Smith has told me, more than 300 marks ahead of the second. C'est tout dire [That's all there is to say], except that Hopkins[4] has been here speaking in the most gratifying manner about the result.

I came here in two hours, at three (in slip slop as I write in haste) & left Fanny pretty well, better than the day I went to Dalham.

I am overwhelmed by greetings from all sorts of folk – I hear I am popular & that everybody (not concerned) is pleased.

I have heard from Thomas Joyce – he is coming up next month.
Give my love to my dear mother, & Penelope.

Yours most affectionately

R.L. Ellis

JAMES DAVID FORBES (1809–1868), Scottish physicist and glaciologist, educated at the University of Edinburgh, elected Fellow of the Royal Society of Edinburgh in 1828 and Fellow of the Royal Society of London in 1832, Professor of Natural Philosophy at the University of Edinburgh between 1833 and 1860. Forbes, an acquaintance of Ellis's mathematics tutor T.S. Davies, first met Ellis – 'a very engaging young man'[5] – in July 1834 in Bath. Ellis recorded their meeting in a diary entry for 20 July 1834: 'I found, on coming home last night, that Mr Davies had called bringing Professor Forbes to see me. […] I went to Mr Davies again & finding him at home went up with him to the York House, but Mr Forbes was gone out. We met him however by the Pumproom, & Mr Davies left us together – We went up on Beacon hill, but the weather was very unfavourable & we came home – where

[4] William Hopkins (1793–1866, 7W 1827), the famous 'wrangler-maker' and Ellis's private tutor at Cambridge. See Barrow-Green's chapter in the present volume for his coaching of Ellis.

[5] James D. Forbes to William Whewell, 21 September 1836, TCL, Whewell Papers, Add.Ms.a.29.

we had a long talk. I showed him what I had done about radiation, & the law of it, – he thought the theory right. He is a tall raw looking good natured loosely built Scotchman, oddly or rather carelessly dressed' (20 July 1834).

[SAUL, 4
Robert Leslie Ellis to James D. Forbes
23 January 1835
Bath]

Crescent Bath
Jan 23d 1835
My dear Sir,

I feel great pleasure in complying with the wish you so kindly expressed to hear from me after your return from the continent,[6] although besides replying to your inquiries respecting my health & employment,I have very little to say.

I hope your tour was as pleasant you could have expected. I am sure science will benefit by it. One point of your course I know, as I saw by the Philosophical Magazine for November that M. Melloni[7] had in a conversation with you at Paris anticipated the remark of Professor Powell,[8] which you have since so satisfactorily answered.[9] I was glad to see this continuation of your highly important investigations with regard to the polarization of heat, a subject beautiful in itself & still more so by its analogy with the polarization of light, & which at least in this country is entirely your own. I hope however that the researches which you mentioned, when I had last the pleasure of seeing you, concerning Solar radiation will shortly be completed, as this has for some time been a favourite subject with me, although a calculation intended to connect theoretically the intensity of radiation of the sun's altitude led me to results so complicated & unmanageable, on the simplest law of decrease of density I could assume, that I have begun to despair of our making meteorology, more than an empirical science at least at present. The fact is that the results of perturbation bear so great a proportion to the total effect produced, that the case is widely different from that of physical astronomy.

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[6] Forbes had travelled to the Pyrenees and Auverge, among other places, studying hot springs and volcanoes, respectively. See John C. Shairp, Peter Guthrie Tait and Anthony Adams-Reilly, eds. *Life and Letters of James David Forbes* (Cambridge: Cambridge University Press, 2010 [1873]), chapter 8.

[7] Macedonio Melloni (1798–1854), Italian physicist who fled Parma, where he had been appointed professor at the local university, after taking part in the 1831 revolution. In 1839, he went to Naples, where he was appointed director of the Vesuvius Observatory. Melloni is today remembered primarily for demonstrating that radiant heat has similar physical properties to those of light.

[8] Baden Powell (1796–1860), Savilian Professor of Geometry, Oxford (1827–1860) and Church of England priest. On Powell see, for instance, Pietro Corsi, *Science and Religion: Baden Powell and the Anglican Debate, 1800–1860* (Cambridge: Cambridge University Press, 1988).

[9] See Baden Powell, "On certain points connected with the recent Discoveries relative to Radiant Heat," *Philosophical Magazine* 7:40 (1835): 296–297; James D. Forbes, "XXIX. Note relative to the polarization of heat," *Philosophical Magazine* 7:41 (1835): 349–352.

Besides this I have done nothing but pure mathematics, & have been reading the Integral Calculus, and the Calculus of Variations—the latter seems to me a very beautiful & abstract subject. Next autumn I hope my health, which has of late been tolerably good will permit my going to Cambridge,[10] so that I shall not in future be able to wander far from the University course of reading.

I was delighted to see that the Philosophical Association[11] meets this year at Bristol; my father joins with me in hoping that should it bring you into this part of the world you will give us the pleasure of seeing you at Bath & of thanking you for the kindness you have shown me. He begs to be remembered to you.

Before that time, I fear there is no chance of our meeting, but I hope that these few lines will entitle me to the pleasure of hearing from you, whenever it may be convenient to you to write.

I remain dear Sir with many thanks
Your truly obliged servant

R. Leslie Ellis

[SAUL, 12
Robert Leslie Ellis to James D. Forbes
9 May 1835
London]

52 Wigmore St London 9th May 1835

My dear sir,

The state of my health prevented my returning to Papworth,[12] at the Christmas vacation, and the same cause has continued so long, that I have at length given up all thoughts of doing so. It was not however, till a few days ago, that Mr Challis sent me my books, which expecting to be absent but a few weeks, I have left with him & together with them, the two very interesting papers, you were so good as to send me.

As Mr Challis did not mention in his letters at what time he received them from you I know now how tardy this acknowledgement of your kindness may appear—but it is not the less sincere from being offered somewhat later, than under other circumstances would have been the case. Believe me your kindness in thinking of me after so casual and short an acquaintance, has made a deep impression on my mind, the more so, as I perceive by the Philosophical Magazine, how much your attention is at present engaged by your highly curious & important investigation, with regard to the polarization & interferences of heat.[13]

[10] Ellis matriculated at Cambridge in October 1836.

[11] Ellis presumably meant the British Association, which held its annual meeting in Bristol in 1836.

[12] In October 1834, Ellis had become the pupil of James Challis, then Rector of Papworth St Everard, in Cambridgeshire. Ellis's residence at Papworth was very short, due to ill health; at the end of his sixth week there, he returned home to Bath.

[13] In 1835–1836 Forbes published some four articles on the refraction and polarization of heat in the *Philosophical Magazine*.

The method of considering the interesting subject of the horary oscillations of the barometer, which you have made use of in the paper[14] you were so good as to send me, which has hardly been out of my hands, since I received it, seems, if I may offer an opinion, more just and philosophical than that of Bourard [sic],[15] which is evidently too sweeping a generalization to suit the phenomena. He seem indeed a worshipper of that 'idola tribus',[16] which leads the mind to seek for more obvious regularity in nature, than really exists – that spirit of system, which especially in an imperfect science[17] is always prejudicial to the advancement of knowledge.—The formula you arrive at, if I may be allowed to judge, is free from those grave & fatal objections, which you allege against that of Bourard, & the results certainly tally much better with observations than his.

I cannot help likewise admiring the philosophical caution, with which you abstain from any hypothesis as to the cause of the phenomena[18]—in the present day, meteorologists should be contented by determining from induction, numerical laws to follow in the footsteps of Kepler—who however depreciated by those who consider him merely as an ingenious charlatan, contributed more than any man of his time, with perhaps one exception to the progress of astronomical science.

Perhaps however, when sufficient data shall be collected to admit of those ulterior investigations to which you allude, in which the influence both of the temperature and height would be considered, a satisfactory cause may be assigned to these important phenomena. In the case of considerable elevation above the level of the sea, perhaps we shall find disturbing forces which will render the problem more difficult in this than in any other case—My reason for this conjecture is, that we have no evidence, but rather a presumption to the contrary, that a negative oscillation is ever produced by the influence of low temperature, apart from high latitudes or considerable elevations.

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[14] Probably James D. Forbes, "VII. On the horary oscillations of the Barometer near Edinburgh, deduced from 4410 Observations; with an Inquiry into the Law of Geographical Distribution of the Phenomenon," *Transactions of The Royal Society of Edinburgh* 12:1 (1834): 153–190.

[15] M. Eugène Bouvard (Ellis, like Forbes in his 1834 paper, misspelled the name), nephew of Alexis Bouvard (1767–1843), noted for his discovery of eight comets and his hypothesis of the existence of an eighth planet (Neptune) in the solar system. Eugène Bouvard was a correspondent of Airy and Challis, among others.

[16] A category of logical fallacy, for which Francis Bacon in the *Novum Organum* coined the word 'idola tribus' ('idols of the tribe'), referring to the human tendency to prefer certain types of incorrect conclusions.

[17] The science in question is meteorology, which, according to Forbes, 'must be ranked, at the present moment, among the most rising branches of knowledge' (Forbes, "On the horary oscillations of the Barometer," 153).

[18] Forbes opened his paper with the following statement: The transition from the hasty generalization which always marks the embryo state of science, to the application of sober inductive analysis, is one so important, and so truly interesting, as to repay amply the philosophical abstinence which it imposes' (Forbes, "On the horary oscillations of the Barometer," 153). It may here be added that Forbes was a correspondent of Whewell, to whose inductive philosophy he was actively committed.

Allow me to hope that should anything occur to bring you again to Bath you will afford me opportunities of telling you personally how highly I estimate your kindness, & how much I am,

My dear sir, your obliged servant

Robert Leslie Ellis

[…]

[SAUL, 293
James D. Forbes to Robert Leslie Ellis
14 February 1836
Edinburgh]

Edinburgh 14th Feb. 1836

My Dear Mr Ellis,

I assure you that it is not from inattention that yours of the 23d Janry has remained so long unanswered, having been (as is usual with me at this Season) most incessantly engaged. I assure you also that I had been long looking forward to the fulfillment of your promise to write to me, & begun to feel some anxiety respected your state of health which I rejoice to hear is improving though I could have wished for more decidedly favourable accounts. Let no stimulus of fame or advantage induce you to make a sacrifice of the first of earthly blessings. I hope you will not get to Cambridge, unless you are equal to the fatigue of such a career as your tastes and talents would enable you to pursue.

I hope that under any circumstances you will not lose sight of your physical pursuits in purely mathematical ones, which are of a comparatively narrow character. It is in the field of contingent truth that the triumphs most congenial to the human mind in a healthful condition are to be gained. The disposition at Cambridge strongly aims in this direction, and I am convinced that you will reap as much credit and more advantage by studying mathematical physics as pure mathematics. I cannot conceive a better exercise than Airy's tract on Light,[19] which contains some hard mathematics, but the acquisition of the clear physical views it presents is much harder. I am glad you should feel any interest in so unpopular a subject as polarized heat. I have now greatly extended my experiments, made the effects much more obvious, and made some new singular discoveries.

The Royal Society of Edinh have done me the honour to award me their Keith Medal for my [illegible].[20]

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[19] Forbes's reference is most likely to George Biddell Airy's tract *Undulatory Theory of Light*, which was added the second edition of *On the Lunar Theory, The Figure of the Earth, Precession and Nutation, and Calculus of Variations*, published in 1828.

[20] Forbes had begun to investigate radiant heat phenomena in 1830 and after contact with Melloni, who had detected the refraction of thermal radiation, he acquired in 1833, with Melloni's assistance, a thermopile for his own use. With this instrument Forbes made several discoveries, eventually demonstrating the identity of the laws that regulate the phenomena of radiant heat and light, thereby making an important contribution to the development of the concept of a so-called continuous radiation spectrum. For these discoveries he received the Keith Medal of the Royal Society of Edinburgh and in 1838 the Rumford Medal of the Royal Society of London.

My summer [illegible] was chiefly in the Pyrenees and Auverge. In the former I studied hot springs, in the latter volcanos. I have just dispatched a paper to the R.S. London on the former subject.[21]

I do not wonder that you were appalled by the difficulties of the measure of absorption of the atmosphere, which in fact involves the same difficulties with the theory of refraction, which has been a celebrated problem amongst mathematics. […]

Believe me with respect & feel remembrances to Mr. & Mrs. Ellis.
Your ever faithful [illegible]

James D. Forbes

[SAUL, 44
Robert Leslie Ellis to James D. Forbes
23 August 1836
Ramsgate]

23d August 1836
3 Royal Crescent
Ramsgate

My dear Sir,

It was not till this morning that I received your kind note of Saturday: I fear you must think me very remiss in replying to it.

Nothing I assure you has been more matter of regret, both with my father & with myself than that the health of the family has obliged us to be absent from Bath at the present time: not only because we lose the opportunity of attending a meeting of the British Association,[22] but also on account of the pleasure it would have given us to see you in our part of the world. We left Bath some weeks ago & there is no prospect of our returning before Xmas.

I was glad to see that you have not forgotten me: believe me I have not lost a grateful sense of your kindness to me, whenever I have had the happiness of seeing you.

Here I know very little of what is going on. There was nothing of yours in the last Phil. Magazine & but little that interested me. Lubbock's[23] demonstration of a property of the parabola is rather curious.[24] It is however only a 'tour de force,' as the same result is obtained by very simple geometrical considerations.

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[21] James D. Forbes, "On the temperatures and geological relations of certain hot springs, particularly those of the Pyrenees; on the verification of thermometers," *Transactions of the Royal Society of London* 126 (1836): 571–616.

[22] The 1836 Annual Meeting of the British Association was held in Bristol.

[23] Together with De Morgan, John W. Lubbock (1803–1865) was one of the most fervent English advocates of Pierre-Simon Laplace's work on probability theory.

[24] J.W. Lubbock, "XXII. On a property of the parabola," *Philosophical Magazine* 9:52 (1836): 100–104.

Some months ago I saw a very elegant speculation of yours on the form of the Gothic pendant;[25] would it be carrying the matter to a fanciful extent to say that the finish at the lower extremity ought to be the complement of the solid of revolution? I mean that the finish should be equal in weight to the portion of the pendant which would be produced by taking in the whole remaining length of the logarithmic curve? Considerations of this nature are in every point of view interesting: they give a certain exactness & dignity to architecture by connecting it in detail as well as in principles with pure science & are striking illustration of the origin of beauty in some things in which taste is not wholly arbitrary.

There is as you say a kind of tact by which the Gothic architects anticipated the results of calculation, & this at least is independent of any of association of ideas, & of everything except the instinct which requires the sense of security. So much however must be admitted, that this sense of security is guided by the nature of the building material to which the eye is accustomed. Thus iron columns have mostly the appearance of fragility unless where they are purposely to avoid this effect, made hollow.

I go to Cambridge in October, & have consequently been obliged to read certain books, & to give up what I have been before doing. The first two books of Euclid is one of the subjects of a preliminary examination on commencing residence. There is not much of novelty in this nor in any other of the subjects & my only resource has been the endless speculation on the foundations of the science of number & magnitude. [Augustus] De Morgan has just published a little book on this subject:[26] he was a school-fellow of my elder brothers,[27] & showed great talent for mathematics very early, but I confess that although the book shows thought, & if I may coin a word not a little hardheadedness, it does not seem to go to the bottom of the subject. Geometry is confessedly conversant about abstract ideas, yet Euclid gives not a single hint as to the way by which the mind arrives at those ideas. He attempted to construct a wholly conventional & so to speak formal system: that he failed is shown not only by the theory of parallels, but also by many other instances that might be adduced. He failed but it was I think impossible to succeed. Nothing seems to have confuted the first principles of geometry more than the idea of its being purely conventional. I can no more help having a certain idea of a line than if I look at a red wafer on a white ground. I can [sic] help seeing that the red is bounded by the white. This is a simple instance but seems to show my meaning. It is as impossible to give

[25] James D. Forbes, "On the mathematical form of the Gothic pendant," *Philosophical Magazine* 8:49 (1836): 449–455. The Gothic pendant vault is a form of vault attributed to the 15th-century English Gothic architects, in which large decorative pendants hang from the vault at some distance from the walls. Forbes's speculation, to which Ellis referred, was most likely the following: 'Having had occasion to consider some time ago what should be the form of a depending column of uniform material, such that the area of a section should always be proportional to the weight sustained, I was led by an easy analysis to conclude, that it must be the solid generated by the revolution of the logarithmic curve, round its axis' (Forbes, "Gothic pendant," 452).

[26] Augustus De Morgan, *The Connexion of Number and Magnitude: An Attempt to Explain the Fifth Book of Euclid* (London, 1836).

[27] Ellis's brothers Francis (Frank) and Henry Ellis attended Mr. Parson's school at Redland, near Bristol.

a real definition of 'line' or 'angle' as of 'blurriness' & that men talk of the former with no more ambiguity that of the latter shows that the former like the latter is the necessary result of an involuntary mental process involuntary because originating from without. To sever them in origin as well as in the development, the science of magnitude from the senses, appears to be to relinquish the true foundation: to do this in his zeal for the dignity of geometry is as [illegible] as I can judge from what I have read of his book the object of De Morgan. I confess he & some others remind me of the story of the Austrian princess, who was journeying to Madrid to become Queen of Spain.[28] In some town, where they halted, a manufacturer humbly offered her a pair of silk stockings. 'Know fellow' said a grandee who was standing by, 'the Queen of Spain has no legs': neither has geometry any founding to stand upon if we reject that of our senses. Forgive this very tiresome disquisition. I have really so few topics—that I have dwelled too long on this one—especially to you—who I know hold with Bacon that 'cobwebs spun by scholars out of their own brains, are admirable for their strength & fineness, but of no use to the purposes of life.'[29] My father desiring to be remembered to you, & with many thanks for your kindness in thinking of me at a time when you must be so much engaged.

Believe me

Your's most sincerely

Robert Leslie Ellis

[SAUL, 58
Robert Leslie Ellis to James D. Forbes
3 October 1841
Dover]

My dear Professor Forbes

Your very kind letter ought not to have remained so long unacknowledged. I could say a great deal as to the causes of my long delay, but I think the history of procrastination is very seldom interesting. If you will only believe that I have been as far as possible from forgetting your kindness, I need not trouble you with an account of how often the intention of expressing my sense of it has been laid aside from languor, or from harmful thought. Nevertheless if I could have given you a satisfactory account of what I was doing you would have heard from me sooner but the same causes which disinclined me towards writing have prevented me from following as I should have wished your kind & encouraging advice. However I hope by & by to have both more energy & more settled views. *Aurion hadion asw*,[30] at

[28] The story appears in *Memoirs de la Cour d'Espagne par Madame d'Aunoy* (1736). It is referred to, in a very different context, in David Hume, "On polygamy and divorces," in *Essays and Treatises on Several Subjects*. New Edition. Volume I (Edinburgh, 1825), 178–187.

[29] 'For the wit of man, if it work upon matter, which is the contemplation of the creatures of God, worketh according to the stuff, and is limited thereby; but if it work upon itself, as the spider worketh his web, then it is endless and brings forth indeed cobwebs of learning, admirable for the fineness of thread and work, but of no substance or profit': Bacon, *Advancement of Learning*, Book I.

[30] 'I'll sing more sweetly tomorrow', a misremembering of Theocritus *Idylls* 1.145.

least I hope so, but at present I oscillate between law & science. I saw in a paper honourable mention of your ascent to the summit of the Jungfrau & was proud to number among my friends the only two Britons of the party.[31] I always imagined that the Jungfrau if not inaccessible, at least had never been scaled—was this a wrong deduction from the name, or were you among the first to disturb its untrodden snows?

I suppose you remember some years since Mossotti and his paper on molecular action.[32] It was proné by Faraday,[33] & made some noise,[34] but the analysis is all wrong (the idea is not his but Roget's[35]) at least so it seems to me, & I sent some remarks on it to the Phil Magazine.[36] I fancy from a very laconic notice of my communication in the new number that the editors do not mean to publish it; [possibly?], as Mossotti's paper was given in the 'Scientific memoirs', Taylor conceived he has a vested interest in his mistakes. That a paper so celebrated as Mossotti's & so liable to objection, should have remained several years unnoticed shows what there was perhaps not much room to doubt, that mathematical writings excite little interest in this country, & are more talked of than read.

I was pleased to see you are continuing your researches on the nature of heat.[37] Your results on the transmission of heat through powders seem to me not only valuable in themselves but also as showing how much more there is to be done. Do you not think that in the theory of heat the connection between radiant & conducted heat

[31] Forbes scaled the Jungfrau, one of the main summits of the Bernese Alps, in August 1841, together with several others, including Louis Agassiz, the Swiss-born American biologist and geologist, and Douglas Denon Heath (1811–1897, SW 1832 and First Smith's Prizeman) – Ellis's future co-editor of *The Works of Francis Bacon*. See 'Appendix B. Historical remarks on the first discovery of the real structure of glacier ice' in Shairp et.al., *Life and Letters of James David Forbes*, 544–561.

[32] Mossotti's 'On the forces which regulate the internal constitution of bodies'. This memoir was printed in Turn in 1836 as 'Sur les forces qui régissent la constitution intérieure des corps, aperçu pour servir à la determination de la cause et des lois d l'action moléculaire'. The English translation was published in *Taylor's Scientific Memoirs*, Vol. 1 (pp. 448–469) in 1837. It is there merely described as: 'From a Memoir addressed to M. Plana, published separately'.

[33] Michael Faraday (1791–1867), largely self-taught English scientist, famous for his discovery of the principles underlying electromagnetic induction, diamagnetism and electrolysis. Faraday communicated Mossotti's 1836–7 paper to Richard Taylor for publication in the *Scientific Memoirs*. Upon receiving Mossotti's memoir, Faraday sought Whewell's opinion, writing that Massotti's theory 'jumps in with my notion […] that Universal Gravitation is a mere residual phenomenon of Electrical Action & repulsion' (Michael Faraday to William Whewell, December 1836, quoted in P.M. Harman. *After Newton* (Aldershot: Variorum, 1993), 176).

[34] Upon the publication of its English translation in 1837, Mossotti's paper was commented on not only by Ellis but also by, among others, Philip Kelland, Charles Babbage and Thomas Exley.

[35] Peter Mark Roget (1779–1869), British physician and natural theologian best known for publishing the *Thesaurus of English Words and Phrases*. In 1831, Roget published a paper in the journal of the Royal Institution on the mathematics of magnetic curves, viewing magnetism as action-at-a-distance.

[36] See note 41 below.

[37] Reference is probably to James D. Forbes, "XXI. Researches on heat – Fourth series. On the effect of the mechanical texture of screens on the immediate transmission of radiant heat," *Philosophical Magazine* 19:122 (1841): 109–125.

is not well made out? Your researches have made it exceedingly probable that radiant heat is so intimately connected with light, that if, as we believe, the one is an undulation the other must be caused by some action of the medium through which the undulation takes place. The material view seems set aside & yet all the theory of conducted heat proceeds on this view, I mean in Fourier[38] & Poisson,[39] while Ampère[40] refers to the vibrations not of an ether but of bodies themselves.[41] I cannot help thinking it curious, that in the theory of light, the influence of the material particles shld be so completely set aside. Is it not because the mathematic enquiry is thereby simplified? So that our analysis gives a bias to our conceptions.

Whenever you are at leisure pray remember that you cannot give anyone more pleasure by a letter than me.

With kind regards,
Believe me as ever

Your obliged friend

R. L. Ellis

18 Waterloo Crescent
Dover Oct 3, 1841

[SAUL, 77
Robert Leslie Ellis to James D. Forbes
10 November 1841
Cambridge]

Cambridge
Nov 10th 1841

My dear professor

Your letter is so kind that I can hardly thank you sufficiently for it—I am sure you will believe that I fully appreciate its warmth & friendliness: and I trust you will accept my hearty thanks for this & for earlier instances of kindness.

I am here for a few days & shall be in town on Friday to keep a law term—on Tuesday I return to Dover. The tract you were so good as to mention, I should be

[38] Joseph Fourier (1768–1830), French mathematician whose *Théorie analytique de la chaleur* (*The Analytical Theory of Heat*) of 1822 exerted strong influence on 19th-centrury mathematical physics.

[39] Siméon Denis Poisson (1781–1840), French mathematician and physicist who in 1837 published *Theorie mathématique de la chaleur*.

[40] André-Marie Ampère (1775–1836), French mathematician and physicist, one of the founders of classical electromagnetism.

[41] The division hinted at by Ellis was roughly that between the mathematical and the experimental approach to the domains of electricity and magnetism, where the former camp (Fourier, Poisson et.al.) was criticized by the latter (Ampère, Faraday et.al.) for the substantive physical assumptions underlying its goal of quantification and mathematical formalization. See, for example, Friedrich Steinle, *Exploratory Experiments. Ampère, Faraday, and the Origins of Electrodynamics*. Translated by Alex Levine (Pittsburgh: The University of Pittsburgh Press, 2016 [2005]).

delighted to receive; if you send it to the Oxford & Cambridge Club Pall Mall London I can get it before going from town.

Many thanks for your offer about my notes on Mossotti.[42] You may have seen that they appear in the present number of Taylor's Magazine,[43] so that I can only thank you for the service you have rendered me, had it been required. I need not say I am as grateful as if you had given me the introduction you spoke of.

I am or have been rather, (for my friends here are too kind to allow me to do much) busily engaged in the essay I once mentioned to you on the doctrine of probabilities.[44] I hope to lay it before our society here early next tern. Not even an author's vanity can prevent my perceiving that it will be tolerably unreadable—a compound of metaphysics and mathematics on an abstruse subject, with regard to which men are contented to take their opinions on trust.

I write rather in haste wishing to save the host. If my next silence shall be shorter than the last, you will forgive this hasty letter.

Ever believe me
Your attached sevt [servant]

Robert Leslie Ellis

[SAUL, 53
Robert Leslie Ellis to James D. Forbes
27 May 1842
London]

My dear Sir,

I this morning received two circulars from you, & hasten to thank you for them. I have been so much out of the world, that I was not aware of the unfortunate disagreement to which they relate.[45] Speaking in all sincerity, I cannot do less than say, that they are entirely satisfactory to me.

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[42] Ottaviano-Farbrizio Mossotti (1791–1863, whose name was sometimes mistakenly given as 'Mosotti' (or even 'Masotti'), for example in his obituary in the *Monthly Notices of the Royal Astronomical Society* 24:4 (1864): 87–89, of which society he was an Associate. Mossotti's name is little known today, even in Italy, but his work helped pave the way for James Clerk Maxwell's famous equations, forming the foundation of classical electromagnetism. See, for example, P.M.M. Duhem, "The fundamental properties of dielectrics. The doctrines of Faraday and Mossotti," in *The Electric Theories of J. Clerk Maxwell*. Boston Studies in the Philosophy and History of Science, vol. 314 (Cham: Springer, 2015), 13–33.

[43] *Scientific Memoirs, Selected from the Transactions of Foreign Academies of Science and Learned Societies and from Foreign Journals*, also referred to as *Taylor's Scientific Memoirs*, was a series of books edited and published by Richard Taylor (1781–1858) in London between 1837 and 1852. The notes referred to ("my notes") have not been found in *Taylor's Scientific Memoirs*. However, in 1841 an article appeared in the *Philosophical Magazine*, signed 'R.L.E.', entitled 'LVII. Remarks on M. Mossotti's theory of molecular action'. This paper does not appear in *The Mathematical and Other Writings of Robert Leslie Ellis*.

[44] Ellis's 'On the foundation of the theory of probabilities'.

[45] Ellis's reference is to a controversy of priorities between Forbes and Agassiz, the origin of which lay in the visit which Forbes made at Agassiz' invitation to the Unteraar glacier in Switzerland, in

Agassiz is evidently a vain & irritable man, unable to bear the idea that any one but himself should do anything to advance the glacier theory; & I think too he must have injudicious friends. It is difficult to believe that Desor[46] did not know he was not speaking the truth, when he affirmed that the structure in question had engaged his attention & that of Agassiz during the summer of 1840. But it must be satisfactory to you that the latter is committed to the acknowledgement that it was new to him in 1841.[47]

I have often reproached myself for not writing to thank you for the Meteorological report,[48] which I read with great interest. Pray ascribe my silence to anything rather than a want of sense of your kindness – which I have ever felt.

I have finished my essay on probabilities & have since been engaged in revising it for publication.[49] Some new views on the method of least squares have also occurred to me; which I sent to De Morgan & had from him much encouragement to proceed in them. I hear too, that Mossotti is going to honour me with a reply[50]; he admitted to a friend of mine that my objections were very plausible. I did not answer what Kelland[51] did,[52] partly because I partake of your dislike to controversy, partly because I thought he left the matter very much where he found it.

I tell you all this, because you will, I am sure, be glad to know that I have not been absolutely idle.

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the summer of 1841. During their trip, a major topic of interest (and conversation) was their observations of the so-called *bandes bleues*, previously little discussed markings in the ice. Both Forbes and Agassiz, in independent later publications, were to establish the importance of these *bandes bleues* in the theory of glacial ice and its movement. A bitter debate ensued about the question of credit for the discovery, and priority in its publication. See Ian Campbell and David Hutchison, "A question of priorities: Forbes, Agassiz, and their disputes on glacier observations," *Isis* 69:3 (1978): 388–399.

[46] Édouard Desor (1811–1882), protégé and later assistant of Agassiz in the United States. At Unteraar, Forbes' relations with Agassiz were cordial, but he clashed with Desor.

[47] As noted in Campbell and Hutchison, "A question of priorities," 390, the exchange between Forbes, Agassiz and Desor is 'exceedingly complex'. Their article presents it in a systematic fashion.

[48] Forbes wrote the 1832 report on British meteorology for the British Association meeting in Oxford. James D. Forbes, "Report on meteorology," *Report of the British Association for the Advancement of Science* (1832): 196–207.

[49] Ellis's 'On the foundations of the theory of probabilities' was read to the *Cambridge Philosophical Society* in February 1842 and published in its *Transactions* in 1844.

[50] The reply does not seem to have materialized.

[51] Philip Kelland (1808–1879, SW 1834 and First Smith's Prizeman), English mathematician, Fellow of Queens' College, Cambridge between 1834 and 1838, when he was appointed Professor of Mathematics at the University of Edinburgh.

[52] Ellis's reference is probably to Kelland's critical discussion of the objections raised, among others by Ellis, to Mossotti's theory of molecular action. See Philip Kelland, "III. On Mossotii's theory of molecular action," *Philosophical Magazine* 20:128 (1842): 8–10.

But to confess the truth, my interest in all these things is much lessened by the yet recent death of my father. Almost everything I did, every pursuit in which I engaged, had directly or indirectly, reference to him, & I feel now that a blank has been left in my life, which I have not energy to fill up. I know well that it is the lot of humanity to mourn & to be comforted, & that 'the strong hours conquer' us.[53] But yet the loss I have sustained is extreme: it has left me alone in the world.

Believe me ever, my dear Sir,
Your obliged & faithful

R. L. Ellis

The Elms
Avenue Road
Regent's Park
Friday 27 May '42

[SAUL, 70
Robert Leslie Ellis to James D. Forbes
17 November 1844
Cambridge]

My dear Sir

On my return to town I found the letter & pamphlet[54] which you were so good as to send me form York. Pray accept my thanks for both. Until my arrival here I had no means of referring to anything that had been written on the subject, & therefore delayed my reply to your letter. Since then I have put off writing from a wish to be able to give you some account of the meeting which took place two days since of our Philosophical society in which the subject of glaciers was discussed. Whewell, Hopkins & Williamson[55] were the principal interlocutors. Whewell professed himself altogether a disciple of yours[56] & said in effect that you had not only created the subject, but left very little more to be done. Beyond

[53] *Hours of Sadness: Or, Instruction and Comfort for the Mourner* (London, 1839), 36.

[54] Not identified, but presumably either Louis M. Rendu's *Théorie des glaciers de la Savoie* of 1840 (which is referred to as 'Pamphlet' in Shairp, Guthrie Tate and Adams-Reilly, *Life and Letters of James David Forbes*, 576) or Whewell's three papers on glacial theory of 1844–45, which were printed together, forming an octavo pamphlet of eight pages.

[55] William Williamson (1804–1875, 2W 1825 and Second Smith's Prizeman), Fellow of Clare Hall, Cambridge, between 1825 and 1850, afterwards Rector of Datchworth, Hertfordshire.

[56] A controversy on 'glacier theories' had arisen between Hopkins and Forbes, in which Whewell intervened at Forbes' request. See Isaac Todhunter, ed. *William Whewell, D.D., Master of Trinity Cambridge, Cambridge: An Account of His Writings, with Selections from His Literary and Scientific Correspondence*. Volume 1 (London: Macmillan and Co., 1876), 315–316. For a discussion see Crosbie Smith, "William Hopkins and the shaping of dynamical geology: 1830–1860," *The British Journal for the History of Science* 22:1 (1989): 27–52.

this testimony, his communication[57] had very little to interest those who have read your writings on the subject.[58] He offered however, (& I understood him as original) an illustration of the formation of the veined structure in the vertical section by supposing the progress of the semifluid stream intercepted by a fixed obstacle as in the figure [little sketch here] & then saying that the resistance to the motion of the ice from whatever cause arising had an analogous effect in producing the upward curving of the lines of separation of quicker from slower motion.

Hopkins dwelt on the mode of formation of the crevasses by the straining arising from the unequal velocity at the different distances from the edge of the glacier. So far as this, I do not see that his views are in opposition to yours, as the formation of crevasses seems due to the solidity & not to the fluidity of the ice stream: his other result is more a point of controversy; that there is not tension between elements of the surface separated by a line drawn nearly in the direction of the blue veins. He is going to publish on this point in the Phil Mag.[59]

Williamson exhibited certain plaster models, in which he alleged that existence of crevasses. I think they were rather to be called wrinkles. He professed himself a complete convert to your view & quoted the observation that the water discharged at the foot of the glacier is in winter clear to infer that at that time of year the motion is in no part due to sliding on the bed.[60]

If any of this report[61] is at all interesting to you pray accept it as an excuse for my not having sooner written. I send you two papers of mine. They are not, I know, on a subject[62] to which you pay much attention, but I cannot deny myself the pleasure of sending them to you.

I was sorry to hear from Williamson that Mrs Forbes's health had been of late a source of anxiety to you. I hope she is now better.

Believe me, my dear Sir
Yours with much truth

R. L. Ellis

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[57] Not identified. Presumably Ellis's reference is to Whewell's response to Hopkins' two papers on glaciers, presented to the *Cambridge Philosophical Society* and subsequently published in its *Transactions* in 1843–44.

[58] Whewell published three short papers relating to 'glacier theory' in the *Philosophical Magazine*, where he (implicitly) argues against Hopkins and defends Forbes.

[59] Presumably William Hopkins, "XV. On the mechanism of glacial motion: To the editors of the *Philosophical Magazine and Journal*," *Philosophical Magazine* 26:171 (1845): 146–169.

[60] For the Forbes-Williamson interaction see J.W. Glen, "Early discoverers III. Correspondence between J.D. Forbes and the Reverend W. Williamson," *Journal of Glaciology* 2:19 (1956): 684–686.

[61] Ellis's letter to Forbes was instrumental in their debate: see James D. Forbes to William Williamson, 22 December 1844, quoted in Glen, "Early discoverers," 685–686.

[62] In 1844, Ellis published on definite integrals, magnetism, probability theory, least squares, the chronometer and finite differences.

Trin Coll
Cambridge
Nov 27 1844

WILLIAM THOMSON (1824–1907), the younger son of James Thomson, Professor of Mathematics at Glasgow, where he matriculated aged 10 in 1834. He entered Peterhouse, Cambridge, in 1841 and was Second Wrangler and First Smith's Prizeman in 1845. Ellis, who was the Examiner in the Mathematical Tripos of that year, declared to Harvey Goodwin, who was then one of the Moderators: "You and I are just about fit to mend his pens".[63] Thomson was Professor of Natural Philosophy at Glasgow, 1846–99, becoming perhaps the most famous mathematician of the Victorian era. He was knighted in 1866 and ennobled as Baron Kelvin in 1892. His name is immortalized in degrees Kelvin.

[CUL, Add.7842 E52
Robert Leslie Ellis to William Thomson
(?) February 1845
London]

Feb 1845

My dear Thomson,

Let me congratulate you on the result of the Smith's prize examination.[64] The papers[65] were, I should think from the result, of a higher character than they have usually been. As the Smith has ex professo especial reference to natural philosophy, it will necessarily tell upon the minds of people in Glasgow;[66] more one would be

[63] See Harvey Goodwin, "Biographical memoir of Robert Leslie Ellis," in William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co., 1863), ix-xxxvi, on p. xix.

[64] The Smith's Prize competition was established in Cambridge in 1768, contributing much towards the success in mathematical physics at Cambridge and forming a springboard for graduates considering an academic career. See June Barrow-Green, "A corrective to the spirit of too exclusively pure mathematics': Robert Smith (1689–1768) and his prizes at Cambridge University," *Annals of Science* 56:3 (1999): 271–316.

[65] There were four papers each written by a different examiner. The examiners for the 1845 Smith's Prize were William Whewell (1794–1866, SW 1816), George Peacock (1791–1858, 2W 1812, Second Smith's Prizeman), James Challis (1803–1882, SW 1825, First Smith's Prizeman) and Samuel Earnshaw (1805–1888, SW 1831, First Smith's Prizeman). See H.W. Cockson to James Thomson, 25 January 1845, in Silvanus P. Thompson, *The Life of William Thomson, Baron Kelvin of Largs. Volume 1* (Cambridge: Cambridge University Press, 2011 [1910], 106–107. I am grateful to June Barrow-Green for providing this information.

[66] For an account of the connection between Scottish natural philosophy and Cambridge 'mixed mathematics' see Crosbie Smith, "Mechanical philosophy' and the emergence of physics in Britain: 1800–1850," *Annals of Science* 33:1 (1976): 3–29. Not unlike Ellis, Smith suggests that certain features of Thomson's work, as well as that of James Clerk Maxwell (1831–1879, 2W 1854), such as an emphasis on the unification of phenomena and on the role of physical and mathematical analogies, may reflect themes belonging to the natural philosophy classes of Scottish universities.

apt to believe than the degree I look upon the professorship as the point in which university honours may be of some service: I hope they will do all that you can with in this matter.

Was not Bronwin[67] expressly invented for the purpose of vexing the editor of the mathematical Journal? I am very much obliged by what you have done. Would you make another effort? I am almost ashamed to ask you to look in the drawers of the library table of which I send you the keys. Of the small bookcase two under compartments are open: would you just look in there? I am all but sure if you can find the clasps the paper is in one of them. I assure you my mind is quite at ease about the marking books. The keys I send you now would let you into matters which touch me much more nearly than they. Pray forgive the trouble I am giving you. If I cannot get the papers without I must go to Cambridge myself for I told Bronwin his paper[68] should appear this time & je n'ai que ma parole ['I only have my own word'].

You can seal the keys up & leave them with my bed maker.

All this is unreasonable but I hope never to do any thing like it again.

I do not know what stay you make in town. If you are in Pall Mall in the afternoon, I dare say I shall be at the Oxford & Cambridge Club.[69] It wld not be fair to as you to come to this Ultima Thule[70] but I should be delighted if you would.

Yours truly

R.L. Ellis

63 Westbourne Terrace
Hyde Parke

[CUL, Add. 7342 E53
Robert Leslie Ellis to William Thomson
20 February 1845
Cambridge]

Trin. Col. Camb.
Feb 20 1845

My dear Thomson

I am very much obliged by your two letters. I will answer such of your questions as I am in a position to reply to at once.

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[67] Rev. Brice Bronwin (c. 1786/7–1869), incumbent at Denby, South Yorkshire, and self-taught mathematician. Bronwin published papers on a variety of mathematical topics (elliptical functions, theory of tides, astronomy) in the 1830s-50s, mostly in the *Philosophical Magazine* and *Cambridge Mathematical Journal*. He was involved in controversy with both Boole and Cayley, who both thought his work had some merit.

[68] The paper referred to is probably Bronwin's 'On certain integral transformations', which appeared in the fourth volume of the *Cambridge Mathematical Journal*, in 1845. By that time, Ellis had involved Thomson with the operation of the journal.

[69] Ellis conducted the business of the *Cambridge Mathematical Journal* from Cambridge, from the family seat at Bath, or when in London, from the Oxford and Cambridge Club in Pall Mall.

[70] 'Ultima Thule' was used to refer to an island north of Britain.

Gregory's book[71] is 10^{d}6 [10 shillings and 6 pence].

Deighton says he has 5 copies of Green's memoir[72] & can get about 20 more. Also that he has written to you.

I should be much pleased if Bachelier[73] would receive subscriptions for the Journal: which however is so dear that no Frenchman will buy it.

I shall be glad to have it understood that any contribution in French will be quite as acceptable as in English & that any accounts or apercus of longer memoirs would be especially useful.[74]

I will speak to [William] Walton about sending copies as you propose.

If there is any point which I have omitted to notice I will repair the omission in another letter.

The copies of Liouvilles Journal or rather of my paper[75] have come to hand in town. They reached Westbourne not Woodbourne Terrace on the day I left town. I am very much obliged by the trouble you have taken about them & flattered that the paper shld have been published so soon, as I only dispatched it about the middle of November, or even later for I only recollect that I sent it off one time that I was confined to my rooms – which happened more than once last term.

I am glad that you seem so busy & cheerful. You make me half wish to be in Paris too.

Gregory's book[76] has hitherto sold admirably. The whole expense was paid by the 18th week's sale, or rather might be paid by it.

Pray write to me again. Now that I am here, I can do more in the way of coming forward &c than while I was in town.

Yrs R.L. Ellis

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[71] Reference is presumably to the first edition of *A Treatise on the Application of Analysis to Solid Geometry* (Cambridge: Deightons, 1845), which was commenced by Gregory and completed by Walton.

[72] George Green, *An Essay on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism* (Nottingham: Printed for the author, 1828). The book, which formed the foundation for the work of Thomson, Maxwell and others on electricity and magnetism, was sold in Cambridge by J. Deighton.

[73] The Paris publisher that also published Joseph Liouville's *Journal de mathématiques pures et appliquées*, founded in 1836.

[74] For the editorial history of the *Cambridge Mathematical Journal* see Tony Crilly, "The *Cambridge Mathematical Journal* and its descendants: the linchpin of a research community in the early and mid-Victorian age," *Historia Mathematica* 31 (2004): 455–497.

[75] Robert Leslie Ellis, "Sur les intégrals aux différences finies," *Journal de mathématiques pures et appliquées* 9 (December 1844): 422–434.

[76] See note 70 above.

[CUL, Add.7324 E55
Robert Leslie Ellis to William Thomson
13 June 1845
London]

My dear Thomson

Some days since I heard from Mrs Alison[77] that the conductor of the 'Nécrologie universel'[78] had applied to Gregory's family for a memoir of him. She wrote to me to enquire of the character of this obituary[79] – of which I know nothing but as it occurred to me that the application had arisen from your having spoken of his merits to some of those you met in Paris, I wrote to say that if you can give her or me any information about it, it will be received with much gratitude. As she is waiting to reply until she hears something about the matter it would be desirable to save time, which might be done if you were to write to her yourself at 44 Heriot Row Edinburgh. You are not altogether a stranger to her – she spoke with interest of having met you near Ardrossan & of Gregory's regard for you.

No news of the Journal. I do wish you would permit me to resign the editorship in your favour[80] – You will in all probability[81] be longer in Cambridge than I shall, & I should be so much better pleased to see it in your hands than in mine. You know I only took it as a jury mast [82]on Gregory's being obliged to give it up.

Pray accede to my very earnest wish on the subject & believe me with the most sincere regard

Yours

R.L. Ellis

The only stipulation I should make is that the negotiation with Johnson should not be abruptly discontinued.[83]

Oxf. & Cam. Club Pall Mall
13 June 1845

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[77] Gregory's sister Margaret Crawford Gregory (1809–1849, who married her first cousin William Pulteney Alison (1790–1859), son of Archibald Alison and Dorothea Gregory. See John Willis Clark and Thomas McKenny Hughes, *The Life and Letters of the Reverend Adam Sedgwick*. Volume 2 (Cambridge: Cambridge University Press, 1890), 68–69.

[78] Probably a pun on the *Biographie universelle*, commenced in 1811 by Louis-Gabriel Michaud (1773–1858).

[79] Not identified.

[80] Thomson took over as editor in 1845.

[81] Thomson, in fact, left Cambridge for Glasgow in 1846, where he was appointed as Professor of Natural Philosophy.

[82] A nautical term for a spar erected to replace a broken mast.

[83] The first edition of the *Cambridge Mathematical Journal* was published by Elijah Johnson, 30 Trinity Street, Cambridge. The second edition, starting in 1846, appeared at Macmillan, also located in Trinity Street.

[CUL, Add.7342 E56
Robert Leslie Ellis to William Thomson
30 June 1845
London]

My dear Thomson

I congratulate you with great sincerity on the fellowship:[84] it was only a question of time, as I suppose one cannot be superannuated[85] at Peterhouse – but still it is well to have it settled in one's favour, to say nothing of the pecuniary part of the business.

I see no objection to the proposed name.[86] Walton will however be better able to advise you than I. I should like to complete what I told you of some time since for the early part of the next volume but really I feel so overwhelmed by the reading required for the report[87] that I do not like to engage in anything else. The paper[88] in Liouville is wholly at your service in French English or any other tongue. One additional result might be given but the thing is complete as far as principle goes without it, & I should have some trouble in recollecting what the other result was like – nothing very pretty I believe. On the whole do not wait in any way for me, I will send you my paper when it is done,[89] & am quite content to let it stand over.

[84] Thomson was elected a Fellow of Peterhouse in June 1845. Having been brought up in the Established (Presbyterian) Church of Scotland, Thomson conformed while at Cambridge to the Church of England, and subscribed to the Thirty-Nine Articles, both on his entry as an undergraduate and on his admission to the Fellowship. See Silvanus P. Thompson, *The Life of William Thomson, Baron Kelvin of Largs. Volume 2* (Cambridge: Cambridge University Press, 2011 [1910]), 1087.

[85] To be ruled out of consideration because of age or elapsed time.

[86] At the British Association meeting of 1845, a group of Dublin mathematicians expressed their wish to make the *CMJ* a joint one between themselves and the Cambridge mathematicians. The expansion of the journal's domain of influence was agreeable to Thomson, who believed that it would benefit from a change of name. The proposed names were *Cambridge and Dublin Mathematical Journal* and *Mathematical Journal*. Whereas Archibald Smith preferred the 'Mathematical Journal' (see Archibald Smith to William Thomson, 16 July 1845, CUL, Kelvin Collection, S145), Ellis seems to have been content to accept the addition of 'Dublin'. Towards the end of July 1845, Thomson reached the nearly permanent conclusion to adopt *Mathematical Journal*, about which Ellis caused him to have second thoughts. See note 91 below.

[87] At the 1845 meeting of the British Association Ellis had agreed to prepare an Association report on 'Analysis' for the following year. The 1846 report was published in 1847 as 'Recent progress of analysis theory (theory of the comparison of transcendentals)'.

[88] Ellis's 'Sur les intégrals aux différences finies'.

[89] Reference is probably to Ellis's 'General theorems on multiple integrals', which appeared in the *Cambridge and Dublin Mathematical Journal* in 1846.

Some time or other soon let me know your brother in law's name[90] – as he was good enough to ask me to call on him & I am not without hopes of being able to do so.

Yours with much haste
R.L. Ellis

63 Westbourne Terrace
Hyde Park
June 30, 1845

[CUL, Add.7842 E57
Robert Leslie Ellis to William Thomson
17 July 1845
Dublin]

My dear Thomson

I am much obliged by your letter.

Touching the copies of the journal in the hands of Gregory's representatives – it will I think be better for Johnson to write to the legal man concerned, viz to James Tytler Office Parliament Square Row Edinburgh.

I dined with Graves[91] yesterday. He thinks the introduction of the word Dublin into the title of the journal would tell very much here.[92] He says many of the younger men tell him they would be happy to contribute if they could look on the journal as in any degree an organ of their university. I asked his permission to tell you of a man called Townsend,[93] quite a young man, of great mathematical promise, & whom you would probably secure by writing to him & sending him a copy of the journal or at least of the last number. He is good at geometry & is now engaged on a long paper[94] of which he would send an abstract or abridgement to the journal – but he is very modest & unaware of his own merits.

[90] William Bottomley, whom Thomson's sister Anna had married in 1844.

[91] Charles Graves (1812–1899), Irish mathematician and clergyman, Erasmus Smith's Professor of Mathematics at Trinity College, Dublin between 1843 and 1862. He was the brother of the jurist and mathematician John T. Graves (1806–1870) who around that time worked as an examiner in laws in the University of London.

[92] Ellis's report from Dublin caused Thomson to have second thoughts about the *CMJ*'s new name. At the beginning of August, Thomson was still in doubt. See note 97 below.

[93] Richard Townsend (1821–1884), mathematician educated at Trinity College, Dublin; B.A. 1842, M.A. 1852, elected Fellow in 1845 and College Tutor in 1847, appointed to the University Chair of Natural Philosophy at Trinity College, Dublin in 1870.

[94] Richard Townsend. "On principal axes of a body, their moments of inertia, and distribution in space," *CDMJ* 5 (1846): 209–227.

I am much obliged by your wish for a paper of mine. I went to work diligently, & in a few days hope to transmit you a paper on the integrals I told you of;[95] it will be hastily done, but I had rather it were so than not to accede to your request.

Yours truly

R.L. Ellis

Eccles S^{t} July 17
Dublin

[CUL, Add 7342 E59
Robert Leslie Ellis to William Thomson
24 July 1845
Drumkeen, Cavan]

My dear Thomson

Your letter followed me hither, so that I cannot communicate for you with Hamilton.[96]

Boole[97] & A. Smith are men in themselves of weight & likely to indicate the opinion of others.

As the title[98] 'Cambridge' has not hindered men not of your university from contributing, so neither would the addition of 'Dublin' operate as an exclusion to men neither of us nor of Dublin – but such men might feel that if a change of title is made, it ought not to be such as to seem as if their existence was ignored by the edition of the journal. My own impression has been that the Journal has derived & would derive respectability from an appearance of connection with an academical body, such connection not being kept up in an exclusive spirit. This impression however I am content to relinquish in accordance with the wishes expressed in the two letters you enclosed & I shall be willing to acknowledge the Math. Journal as the legitimate successor of the C.M.J. to use Smith's symbol. With respect to the view expressed in the beginning of his letter, it must be remembered that the journal

[95] This is probably Ellis's 'General theorems on multiple integrals', first mentioned in his letter to Thomson of 30 June 1846.

[96] William Rowan Hamilton (1805–1865), Irish mathematician, Andrews Professor of Astronomy at Trinity College, Dublin, and Royal Astronomer of Ireland. Like Charles Graves, Hamilton preferred the name *Cambridge and Dublin Mathematical Journal*.

[97] George Boole (1815–1864), largely self-taught English mathematician, philosopher and logician, best known as the author of *The Laws of Thought* (1854) and the inventor of 'Boolean algebra'. As the first Professor of Mathematics in Ireland's new Queen's College (now University College) Cork, he made a name for himself in the fields of differential equations and algebraic logic.

[98] At the end of July, and beginning of August, Thomson was still in doubt about the *CMJ*'s new name. Boole and Smith preferred *Mathematical Journal*, whereas Charles Graves and William Rowan Hamilton were in favor putting 'Cambridge and Dublin' in the title, with Graves offering 'British and Irish' as an alternative. Thomson also wrote to Boole, who advised that it was wise to have Graves and Hamilton as allies, which seems to have sealed the matter. See Crilly, "The *Cambridge Mathematical Journal*," 475.

is growing up from youth to manhood & that what was true seven years ago is not true now.

Could there not be a connection with Dublin indicated by getting the name of some Dublin publisher on the title page?

I must send you a note to my paper[99] to follow the last sentence in which the words I believe are to be omitted. Make any other alteration you think fit. I trust to you as I wrote it very hurriedly to hinder my exposing myself by any absurdity or glaring awkwardness.

I shall be henceforth a good deal in motion. But the subjoined is a good address.

Yours truly

R.L. Ellis

Drumkeen
Cavan
July 24, 1845

[CUL, Add.7342 E60
Robert Leslie Ellis to William Thomson
26 July 1845
Drumkeen, Cavan]

My dear Thomson

I can quite well understand that you find yourself disagreeably placed between the rival publishers;[100] there can be no question as to your being quite at liberty to do that which suits you best, but it is not pleasant to bring two Christians into the tempers of wild cats, & to fill them full of envy[,] hatred & malice & all uncharitableness. I knew how it would be (as nurses say to children), when you were so good as to take the journal off my hands, which would soon have wearied of holding the balance between Johnson & MacMillan.

For permission to reprint the first volume application must be made to Tytler whose address I gave you in a former letter. The difficulty will I am sure be made. All the last volume, except the first number of it, belong to Walton & me.[101] The first number like all the earlier stock belongs to Gregory's representatives. I am afraid I shall have passed beyond your part of the world before you arrive there.

The list of alterations which A. Smith[102] gave me in his papers is in my rooms. You had much better ask him for another copy than wait until my return, as I am not sure I could find it without some delay.

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[99] See note 88.

[100] See note 82.

[101] Ellis and Walton edited the February, May and November numbers of 1844 and February and May of 1845.

[102] In 1845, Archibald Smith was a hard-working Chancery barrister, in London.

I saw at Oscott[103] what you quote from the Comptes Rendus.
I wrote to you on the 22^{d} & again on the 24th.
I am, my dear Thomson

Ever truly yours
R.L. Ellis

Drumkeen
Cavan
July 26, 1845

[CUL, Add.7342 E62A
Robert Leslie Ellis to James Thomson[104]
11 May 1846
Cambridge]

My dear Sir

I write to you, at your son's request, & on a subject which I am sure will interest you.[105]

The idea, if there is such an idea, that it is the common opinion in this university that as a private tutor[106] he advances too rapidly or 'talks over men's heads' is I verily believe, perfectly unfounded. I have never heard a syllable to that effect, or indeed any 'but' whatever affixed to the expression of the universal regard & admiration of which he is the object.

As you perhaps know I am a good deal in Cambridge & not out of the way of hearing of what is done & said, so that my evidence may not be wholly without value.

I am sorry that when I was in Scotland last summer, it was impossible for me to pay you my respects.

I am, my dear Sir,

Very truly yours

R.L. Ellis

[103] St. Mary's College, Oscott, near Birmingham.

[104] James Thomson (1786–1849), Irish mathematician, author of mathematical schoolbooks and notable for his role in the formation of the Glasgow school of thermodynamics. He was appointed Professor of Mathematics in Glasgow University in 1832.

[105] A rumour had come to Thomson's father's ears in Glasgow. He had heard that his son was unable to instruct ordinary students; concerned, as he was, about his son's testimonials, he wrote to him, stressing that he '*must* take care to cure the evil, if it exists'. All too aware of his father's concern, Thomson asked Ellis to write to his father, who, once his fears had blossomed, could not let them go.

[106] During this time in 1846, Thomson coached undergraduates (as he himself had been coached only six months earlier).

T.C.C.
May 11 1846

[CUL, Add 7342 E71
Robert Leslie Ellis to William Thomson
20 October 1846]

Oct 20th 1846
T.C.C.

(I only got yrs today)

My dear Thomson

It is not easy to find a motto[107] off hand. Here are two or three attempts with none of which I am pleased.

To allude to the change of name[108] yet unity of character of the journal. *Mia morphe, duwn onomatwn*.[109] The original is *pollwn* instead of *onomatwn* & is in Aeschylus. To the union of Cambridge men with Dublin & men of neither university. *Keklute men Trwes kai Dardanoi ed epikouroi* [Listen to me, Trojans, Dardanians, and allies][110] – which is a line of Homer as you will probably perceive. This is farfetched.

To the difficulty of mathematical studies &c. – may be taken in the general sense of excellence. *Tes d'aretes idrwta theoi proparoithen etheka athanatoi. Makros de kai orthios oimos es auten kat trechus to prwton. Epen d'eis akron hiketai, reidie de epeita pelei, chalepe per eousa*. [The immortals have placed much sweat in the way of virtue. It is a long and steep path that leads to it, and rough at first, but when one gets to the top it becomes easy, tough though it is.] These are well known lines from Hesiod.[111]

To the various branches of mathematical science: *technwn heterwn heterai. Chre d'en eutheiais oudeis steichonta marnasthai phuai* – "in the direct paths walking – to labour – to strive *sun phuai*, according to each man's genius". This is from Pindar – not easily construed & not very a propos.[112]

I am sorry not to have been more successful but finding mottoes is like making jokes – scarcely to be done to order.

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[107] On the search for a suitable new motto see Crilly, "The *Cambridge Mathematical Journal*," 477, 486. The chosen motto for the first volume of the *CMJ* was taken from Hesiod's *Works and Days*, a motto placed on the title page – in translation: 'half is more than the whole'. Other classical Greek quotations appeared on later volumes.

[108] Around August 1845, Thomson had finally decided to adopt *Cambridge and Dublin Mathematical Journal* as the new name.

[109] 'A single form with two names', based on Aeschylus, *Prometheus Vinctus*, 210.

[110] *Iliad* 3.456, 7.348, 368, 8.497.

[111] *Works and Days* 289–92.

[112] Pindar, *Nemean* 1.25: 'Different men have different skills. The man who takes the straight roads must rely on nature in the fight', literally fight by nature – i.e. be a nice well-bred aristocrat rather than an aspirant lower-class guttersnipe.

What do you think of a freshman[113] who called on me today (he is a sort of connection of mine) & in whose lodgings I afterwards found a bottle of wine in one corner cigar case & tinder box in an other, two packs of cards on a table, a varmint dog on the sofa, (saving your presence) a spittoon[114] under it?

Ever yours

R.L. Ellis

I am not sure about the accents in my first motto, but you can easily ascertain – I would if I had a lexicon at hand.

[CUL, Add.7342 E73
Robert Leslie Ellis to William Thomson
26 January 1847]

O.&C.C.
Pall Mall
Jan 26 1847

My dear Thomson

I wrote some time since to you but did not send my letter & it is now too old to send: this is no excuse for not sooner writing, but it is a fact & as being so, may perhaps interest you.

Many thanks for the M.S. Comparing it with what[115] you got from the north of England touching the parallelogram of forces it reminds one of a question I once heard proposed whether an English snob or an Irish were the most unbearable.

I have thought of what is commonly said about the effect of volcanic explosions &c in increasing the earth's angular velocity & so diminishing the length of day & contrariwise of the friction of rivers waves &c in lengthening the day. Am I wrong in thinking all this wholly unsatisfactory? It seems to me that although a volcanic explosion does increase the earth's vis viva while a breaking wave decreases it, yet that with reference to quantities of the order of magnitude of these effects we are not entitled to take Mk^2w^2 as the measure of the vis viva, (w being L as velocity). To this expression we must add a term expressing the v.v. due to the motion of waves – of rivers – of the air, of lava streams &c – & it is this term which momentarily increases or decreases by the impulsive forces of explosion or collision.

Else how do we escape from the difficulty that the earths principal moment is Mk^2w & that the conservation of moments is not affected by any internal action, so that w remains constant in despite of all the actions I have mentioned?

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[113] Not identified.

[114] A receptacle made for spitting into.

[115] Not identified. The only relevant publication found is a short note: Thomas Wilkinson, "On the demonstration of the parallelogram of forces in Poisson's *Mechanics*," *The Mechanics Magazine* 48 (1847): 115.

Pratt[116] if you notice, & it is worth noticing, first proves by the conservation of moments that no action of volcanoes &c can, compensated or not, produce any change in the length of day: he afterwards proves by the principle of C.A. [conservation of areas?], that it will produce a change – adding that experience shows that the actions of explosion balance those of collision.

Or take the matter thus: put a cannon at the equator pointed to the east & fire it off. If the explosion were strong enough the recoil would destroy the earths angular velocity altogether – yet the vis viva, of the system would of course increase.

I should like much to hear from you on this point.

Say everything for me to your party & especially give my respects to your father.

Ever yrs

R.L. Ellis

[CUL, Add.7342 E78
Robert Leslie Ellis to William Thomson
15 January 1849
Cambridge]

Jan 15, 1849

My dear Thomson

Let me assure you of my sympathy in your loss[117] which seems to come more home to my own recollections of sorrowful things than almost any other that you or any one could sustain. My father's death[118] was, of a single event, the greatest grief of my life, which has been sufficiently chequered by suffering of various kinds. In that case there were doubtless peculiar circumstances as of pain, but in almost all cases the occasion must be a very sad one. More than almost any other loss, the death of one's father disarranges & breaks up the whole system of one's life & of the relations in which the members of his family stand to one another, & the mere grief for him is often mixed up with various other feelings all bitter & all increasing the bitterness of the natural loss.

On the other hand as the death of parents before their children is according to the course of nature, the wound soon heals, & leaves no enduring scar behind it.

I need not assure you of the affectionate respect which I felt for your father, because I think you must have been aware of it, even had I not (which I dare say I have) spoken to you of him, & of my feelings towards him.

Remember me to your brother & believe me

Very sincerely yours
R.L. Ellis

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[116] John Henry Pratt, *The Mathematical Principles of Mechanical Philosophy, and Their Application to the Theory of Universal Gravitation* (Cambridge, 1836), 484.

[117] Thomson's father James Thomson, born in 1786, died on 12 January 1849.

[118] Ellis's father Francis Ellis had died in 1842.

Trin.Coll.Camb.
Jan 15 1849

[CUL, Add.7342 E79
Robert Leslie Ellis to William Thomson
29 January (1849/50?)]

My dear Thomson

I am very much obliged by yr letter: I think of publishing in the Phil.Mag. some remarks on Herschel's demonstration[119], & therefore wish to see what can be said about it.[120] So you will forgive my troubling you again about it.

I doubt if Herschel had any thing so recondite in his mind as the demonstration you & Smith make for him. At the same time I think you will admit that this demonstration will absolutely not do. Adopting your notation *fx*.*fy* d*x*d*y* is in reality the probability that of two arrows the first will strike in one of the streaks & the second in the other which is by no means the same thing as the probability that one arrow will strike in the space common to both.

I tell you that a bag contains 500 balls of which 50 are black & 50 white, & of which 50 are notched & 50 plain, & ask you the chance that in 2 drawings (the ball drawn being replaced after the first) I shall first draw a white ball, & secondly a notched one – you answer at once that the chance is ¼. But if I ask you the chance that a single drawing will give a white notched ball you will show your discretion by saying the question is indeterminate by an assumption that as many white balls are notched as not, but this is merely an assumption which the results of a long run of trials may altogether refute.

Or put it thus. If the probability that the arrow strikes between y & $y+dy$ is $w\overline{xy}\,dxdy$, which is clearly the general assumption, then your *f*x is $\int_{-\infty}^{+\infty} \overline{w}\,\overline{xy}$ dy & your *f*y is $\int_{-\infty}^{+\infty} \overline{w}\,xy$ dx; Therefore you should have $\int x \int y = \overline{w}\,\overline{xy}$ or

$\overline{w}\,\overline{xy} = \int_{-\infty}^{+\infty} \overline{w}\,\overline{xy}\,dx \,.\, \int_{-\infty}^{+\infty} \overline{w}\,\overline{xy}$ dy which is manifestly false unless particular forms are given to $\overline{w}$.

In truth, it is manifest that the probability of the arrow striking in a particular place cannot be expressed in terms of *f*x & *f*y, because the form of these functions may remain unchanged the form of *w* varying in an infinite number of ways.

I conclude that you & Smith were right in being dissatisfied with the demonstration.

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[119] The demonstration appeared in Herschel's 'Quetelet on probabilities'. As Ellis mentioned in a letter to Walton, dated 6 September 1850, he corresponded with both Thomson and Smith about 'Herschel's nonsense' (Add.Ms.c.67/71). See Stigler's chapter in the present volume for the relevant context and details.

[120] The paper was published in November 1850. Robert Leslie Ellis, "Remarks on an alleged proof of the method of least squares, contained in the late number of the *Edinburgh Review*. In a letter addressed to Professor J.D. Forbes," *Philosophical Magazine* 37:251 (November 1850): 321–328.

The factor *f*x in your conclusion [illegible] is equal to unity as appears by making $x = 0$, & then as $\int_{-\infty}^{+\infty} fxdx = 1$, (or certainty) we must have $\sqrt{\frac{\pi}{m}} = 1$ [formula] or $m = \pi$. So that Herschel succeeds in determining not only the form of the function but it's [sic] constant – whence it appears that everybody shoots equally well at a target, or at least that we are psychologically compelled to believe they do.

Touching the value of the bull's eye – has the method of least squares, which is merely a rule for combining linear equations, any thing to say to it? I suppose we ought to give a value to the signs proportional to the difficulty of [*illegible*], or inversely proportional [*rest of the letter is missing*]

[CUL, Add.7342 E80
Robert Leslie Ellis to William Thomson
4 September (1849/50?)
London]

Belgrave Place 4th Sep

My dear Thomson

I have to thank you for your second letter enclosing Smith's.[121] I have answered the one I got from him the next day. We seem to be pretty well agreed, only I am not sure that we are so touching the reason why you are not entitled to say the probability of hitting the space common to two streaks is the product of those of hitting each streak. The reason a priori seems to me to be, that the resolution of a compound event into its elements must, in order that the common rule of taking the product of the probabilities may apply, be a real separation in rerum natura,[122] & not merely a regarding of a single event in two different points of view. And this I think is precisely illustrated by the notched balls. We are not entitled to say drawing a white notched ball is equivalent to drawing a white ball & a notched one, & the probability calculated on this principle will be wrong except in a particular case. If 1/m of all the balls are white & 1/n notched, 1/mn will not express the proportion of white notched balls, unless the proportion of notched balls is the same amongst the white balls, as amongst the balls in general. This is just analogous to the condition wny = [symbols to be inserted] which expresses that the comparative frequency of deviation in the direction of y, is the same for the streak at x as for any other streak. Unless wxy is of this form we cannot say fxfy = wxy.

[121] Ellis's letters to Smith seem not to have survived.

[122] 'The nature of things', Lucretius' *De Rerum Natura*.

I made out lately that if *fr dr* is the probability that the distance from the centre of the target is between *v* & *v* + *dv* – deviations in all directions being equally probable, then $\frac{1}{\pi}\int_x^\infty \frac{frdr}{\sqrt{r^2-x^2}}dx$ is the probability the deviation projected on Ox, lies between *x* & *x*+*dx*.

If the probability of the latter deviation is called $\sqrt{\frac{h}{\pi}}e^{-hx^2}dx$, we have $\frac{h}{\pi}e^{-h\left(x^2+y^2\right)}dxdy$ for that of the arrows falling on dxdy, at xy or transforming & integrating for θ.

$2he^{-hr^2}rdr$ for the probability the deviation lies between *r* & *r* + *dr*. So that even in Herschell's [sic] case – he cannot get the probability of deviation east or west to follow the same law as that of deviation generally. To illustrate my formula put $fr = 2he^{-hr^2}r$, we have to value

$$\frac{2h}{\pi}\int_x^\infty \frac{e^{-hr^2}r}{\sqrt{r^2-x^2}}dr = \frac{2h}{\pi}e^{-hr^2}\int_0^\infty e^{-hr^2}dy$$

if $y^2 = r^2 - x^2$. that is $= \frac{\sqrt{h}}{\sqrt{\pi}}e^{-hr^2}$ as should be.

From this formula it follows that

$$\int_0^\infty dx\int_x^\infty \frac{Fr}{\sqrt{r^2-x^2}}dr = \frac{\pi}{2}\int_0^\infty Fr\,dr,$$

which is easily verified.

I mean to be here all this month & probably the next. In fact I have no plan of going away.

Yours ever

R.L. Ellis

ARTHUR CAYLEY (1821–1895) was educated at Trinity College, Cambridge, which he entered in 1838, graduating Senior Wrangler and First Smith's Prizeman in 1842. Cayley. He became the leading pure mathematician in Britain, published on invariant theory, quaternions, determinants and other topics, publishing several hundred papers. After working as a successful conveyancing barrister, he was elected to the new Sadleirian Chair of Pure Mathematics at Cambridge in 1863, which he held until his death in 1895.

[CUL, Add.7342 E77
Robert Leslie Ellis to Arthur Cayley
26 February 1847
Cambridge]

T.C.C.
Feb 26, 1847

My dear Cayley

I imagine that part of your letter is rather addressed to [William Collings] Mathison than to me – seeing that I assuredly did not ask for your vote on the ground of loyalty or of any thing like it.[123] For that word, so used, & for the people who so use it, in so far as their character is thereby indicated I confess to feeling something like contempt.

The idea of a bachelor's prize for a mathematical essay I have long entertained & hoped that the obvious appropriateness of the case would have suggested it to the Johnians.[124] But I hear that they have decided on founding an Adams scholarship.[125] This plan however avoids the mischief of an additional examination as the new scholarship will of course be given like the old ones according to the results of their college examinations.

You have I suppose heard that Thomson has lost one of his brothers.[126]

I hope at Easter to have the pleasure of seeing you I was on the point of calling on you before I left town, but was somehow prevented.

Yrs very truly
R.L. Ellis

DUNCAN FARQUHARSON GREGORY (1813–1844), son of James Gregory, Scottish physician and classicist, and great-great-grandson of another James Gregory, Fellow of the Royal Society and the first Regius Professor of Mathematics at the University of St. Andrews. Duncan F. Gregory entered Trinity College, Cambridge in 1833, graduating Fifth Wrangler in 1837. He was elected Fellow in 1840, serving as a Moderator (1842) and Examiner (1843) in the Mathematical Tripos. At the suggestion of his friend Archibald Smith (1813–1872), he founded and was the first editor of the *Cambridge Mathematical Journal* in 1837. He was briefly succeeded as editor by his friends and colleagues Ellis and William Walton. Many of his articles for the *CMJ* were collected in *The Mathematical Writings of D.F. Greg-*

[123] Context unclear.

[124] Members of St. John's College, Cambridge.

[125] Contrary to what Ellis writes, in 1848 the Adams Prize was established by members of St. John's College, Cambridge, in honour of John Couch Adams' prediction of the existence of the planet Neptune. The history of the prize is described by James Challis in a letter to William Thomson of 28 February 1855 (CUL, Add.Ms.7342.C76A).

[126] Thomson's brother John Thomson, born in 1826, died in 1847, due to a fever contracted in the course of his duties as a medical student.

ory, edited by Walton, and accompanied by a biographical memoir from Ellis. He was offered the Mathematical Chair at the University of Toronto in 1841, which he was unable to accept due to illness. He died in Edinburgh in February 1844, aged 30.

[Add.Ms.c.67/110

Robert Leslie Ellis to Duncan Farquharson Gregory

Undated, but from 1842/3

Dover]

Do you know the integral $\int_0^\infty dx\, e^{-ax} \frac{\sin^2 rx}{x} = \log\left\{\frac{a^2+4r^2}{a^2}\right\}^{\frac{1}{4}}$?[127] It is very simply proved.

My dear Gregory,

I have to thank you both for your letter, & for a newspaper with the papers. I did not mean to say that I had no idea how ten of the morning problems[128] were to be solved, but only number (10).

I can imagine the Johnians read the journal diligently, it must have done them good. But I was pleased to see how fairly in your[129] problem paper you kept clear of the parts of analysis to which your own taste inclines you the most, especially as I had heard it surmised that you would not be able to avoid giving them an undue preponderance.

Since I sent off my paper on the general theory of probabilities, I have been working at the subject of errors of observation. My conclusion is that Laplace is quite wrong in supposing his results to be independent of the law of probability of error.

It is hazardous to differ from Laplace on a matter of pure mathematics. I intend however to make a second paper for the Phil. Soc. on the subject,[130] & am therefore anxious to take opinions before I commit myself by any thing like publication.

Would you let me send you about a dozen pages on the points? I have given up going to town although my place is taken, on account of the frost. If you would be so kind as to read them & make [Archibald] Smith read them, I should be very much obliged to you both.

I do not think you would find what I have written without interest.

In the course of these speculations, I have arrived at two very general theorems, themselves cases of a more comprehensive one, not yet worked out.[131] If $v + x_1 + x_2 \ldots . x_z = a$, then

[127] Ellis's treatment of integrals of this sort with reference to Pierre-Simon Laplace is given in "On the evaluation of certain definite integrals," *Cambridge Mathematical Journal* 3:16 (1842): 185–189.

[128] Problems in the morning examination papers of the Mathematical Tripos.

[129] Gregory was a Moderator, setting the problem papers, in the Mathematical Tripos of 1842. He was Examiner in the following year.

[130] Ellis's 'On the method of least squares' was read at the Cambridge Philosophical Society on 4 March 1844 and published in its Transactions later that year. See Stigler's chapter in this volume for a discussion.

[131] See Ellis's 'On the evaluation of definite multiple integrals' of 1843.

$$\iiint \ldots dx_1 dx_2 \ldots dx_z fv.\varphi_1 x_{1,\ldots} \varphi_z x_z =$$

$$\frac{1}{\pi}\int_0^a \cos ar dr \int_{-\infty}^{+\infty} fv.\cos rv\, dv \int_{-\infty}^{+\infty} \varphi_1 x \cos rx dx_1 \ldots$$

If $f : \varphi_1 \ldots \varphi_z$ &c remain the same when x changes its sign or if $fx = -fx$ &c. &c[132] the cosines in the preceding theorems are to be replaced by signs, according to a certain law. If […] may be discontinuous. If they are not, the integrals on the first side extend from $-\infty$ to $+\infty$. If they are, the limits are subject to a certain condition.

From these theorems I believe all the results with regard to definite multiple integrals may be deduced.

I have obtained the following general corollary

$$\iiint \ldots fxf_1 yf_2 z\, dxdydz \,\&\, \text{c.}$$

$$= \frac{1}{\pi}\int_0^a \frac{\sin ar}{r} dr \int_{-\infty}^{+\infty} fx.\cos rx\, dx \int_{-\infty}^{+\infty} f_1 y \cos ry dy \ldots \,\&\, \text{c.}$$

given by $x + y + z + \;\&\; c. \leq a$ where the limits on the first side are given by $x + y + z +$ &c $= \leq a$. This is for the case of $fx = +f - x$ &c.[133]

There may be restrictions which I have not as yet got – but I believe the results are correct.

The theorems may be proved by the method which Deflers (see Poisson [in *Théorie de la chaleur*]) applied to Fourier's theorem, which is of course a case of mine, & in other ways.[134] What is the value of $\int_0^\infty \frac{\cos x}{x^\mu} dx$? I know Laplace gives it in the Memoirs of the academy for 1782.[135] I want it in order to deduce Dirichlet's theorem[136] from mine.

I am sorry not to see you in town. Kind regards to Smith.

Ever yours

R.L. Ellis

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[132] f satisfying $f(x) = -f(-x)$ means f is an *odd* function

[133] f satisfying $f(x) = +f(-x)$ means f is an *even* function

[134] Siméon Denis Poisson, *Theorie mathématique de la chaleur* (Paris, 1837).

[135] Ellis's reference is probably to Laplace's 1782 memoir (published in 1785) 'Mémoire sur les approximations des formules qui soint fonctions de très grand nombres'.

[136] Johann Dirichlet (1805–1859) was a German mathematician, who made major contributions to number theory, Fourier series and other topics in mathematical analysis. In 1837, he published what is now called Dirichlet's theorem on arithmetic progressions. See Crilly's chapter in the present volume for an account of Ellis's work in this regard.

ARCHIBALD SMITH (1813–1872), Scottish mathematician who first introduced the idea of founding a mathematical journal to Duncan Farquharson Gregory, several months before Gregory took his Tripos examination, in 1837. Smith himself entered Trinity College in 1832, graduating B.A. as Senior Wrangler in 1836, the year in which he also won the First Smith's Prize and was elected Fellow of his college.

[Letter in the possession of Stephen Stigler
Robert Leslie Ellis to Archibald Smith
3 September 1850]

My dear Smith

I am glad to find we are so nearly agreed.[137] Your second letter came just in time to stop my answer to the first; in which I had insisted that as soon as you assume Πxy=fxfy, you have already determined the form of f, & that it is only by virtue of this assumption that the equation fxfy = fof$\sqrt{(x^2+y^2)}$ is the expression that the probability of an error depends on its magnitude alone. So that the equation for determining the function f, results from a predetermination of this function.

We are perhaps more nearly at one touching the notches than seems at first.

My meaning was to show that when you resolve a compound event into simple ones, these must be in rerum naturâ independent, & not only mentally separable, if you are entitled to assert the probability of the former to be the product of those of the latter. If there were three balls in a bag & you knew one to be white & notched, one to be black & notched, & one to be white & plain, you would say & rightly that the probability of drawing a white notched ball is 1/3. But on Herschell's plan of saying a deviation SW is <u>equivalent</u> to two deviations S and W respectively, you would be justified in reasoning thus. "To draw a white notched ball is a compound event, of which the elements are drawing a white ball and drawing a notched ball: the probability of each element is 2/3. ∴ that of the compound event is 4/9". In this case you clearly would be wrong.

I have been in the habit of considering chance questions indeterminate when you are not acquainted with all the <u>permanent</u> circumstances of the case, using permanent in contradistinction to fortuitous. Of course you may get definite results by assuming that no such circumstances exist: as in that the die has no bias etc. But then the objective truth of the results depends upon that of this assumption: whereas if you <u>know</u> there is no bias, if you <u>know</u> the proportion of notched balls to be the same for black & white balls, then you are sure that on a long run of trials, the results of calculation will be ultimately verified by those of observation. This distinction is not unimportant, because the essence of the doctrine of chances is the disappearance on the long run of the effect of fortuitous circumstances, & the consequent development of definite ratios between the number of times different events occur.

In the theory of probabilities as in other things, an assumption merely founded on ignorance must pass for what it is worth. If you were for instance to go on betting on the strength of such an assumption, you might find yourself ontologically ruined,

[137] See Stigler's chapter in the present volume for the context of Ellis's letter to Smith.

& would hardly be consoled by Herschell's [sic] telling you that you were psychologically right.

The mysterious letter went off yesterday.

Very truly yours
R. L. Ellis

Belgrave Place, Brighton Sep 3 [1850]

AUGUSTUS DE MORGAN (1806–1871), English mathematician and logician, educated at Trinity College, which he entered in 1832, coming under the influence of George Peacock and William Whewell. He graduated Fourth Wrangler in 1827, but never became a Fellow, feeling a strong objection to the necessary theological test. De Morgan became Professor of Mathematics at the London University, 1828–31 – established on the principle of religious neutrality – and, at the same institution (renamed University College London), 1836–66. He was a leading writer on probability and on the history and bibliography of mathematics.[138]

[TCL, Add.Ms.c.67/111
Augustus De Morgan to Robert Leslie Ellis
24 June 1854
London]

7 Camden Street & Town
June 24, 1854

My dear Sir,

I know something about this question[139] – and before I read your remarks, I should like you to see what bearing my view of it has on yours.

Two years ago, a pupil[140] of mine told me that in colouring maps for his own amusement, he never found more than four colours wanted, and asked me what the reason was. Whether this pupil is the proposer, I do not know.

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[138] For a full account of De Morgan's life and work, see Karen Attar, Adrian Rice and Christopher Stray, eds. *Augustus De Morgan, Polymath: A Reassessment at 150* (forthcoming 2022).

[139] Together with a letter to William Rowan Hamilton of 23 October 1852 and to William Whewell of 9 December 1853, this letter from De Morgan to Ellis is among the traditional sources concerning the 'Four Colour Problem', introduced here as a conjecture. The question that occupied him the most, and which he took as the core problem, was whether one could prove that in the case of four countries that pairwise have a common border, one of them would be enclosed by the other three. See Robin Wilson, *Four Colors Suffice: How the Map Problem Was Solved* (Princeton: Princeton University Press, 2002), chapter 2.

[140] About 1850 Francis Guthrie (1831–1899), then a graduate student at University College, London, noticed that four colours are sufficient to distinguish the countries on a map of England. Somewhat later he showed his younger brother, Frederick Guthrie (1833–1866), then a student of De Morgan. Frederick Guthrie communicated the conjecture to his teacher, who, in turn, communicated it to Sir William Rowan Hamilton (1805–1865), saying that he was unable to supply a proof. The problem lay dormant for several years, until it was revived by Arthur Cayley in 1878.

On looking at the question I perceived that the thing depends upon the following theorem: If four subdivisions of superficial space have each common boundary line (more meeting at a point [inserted: symbol with three intersecting lines in one point] excluded) with the other three, one at least must be enclosed by the others. [Drawing] Here A marches with B, C, D; B with A, C, D; C with A, B, D; D with A, B, C and A is inclosed; so that, put the fifth country as you will, the colour of A is set free for use.

On looking for demonstration of this, I found nothing more simple on which to found it, and on thinking of it, it became an axiom to my mind, and I quoted it in a paper[141] sent to Cambridge (but not yet published) as an instance of Whewell's views about latent axioms, things which at first are not even credible, but which settle down into first principles. I have tried it on various persons, who all doubted it at first, and tried to draw some way of making the fourth come out.

As far as I understand your discussion – the theorem abovementioned is not perceptibly used – but it may be latent – and this will be seen by you more easily than by me.

Let me have your thoughts on this point – and let me know how your health is – I hope you are better than when I last heard, which however is now some time ago.

Yours very truly

A. De Morgan

WILLIAM WHEWELL (1794–1866), English polymath educated at Trinity College, Cambridge; B.A. 1816 (2W and Second Smith's Prizeman); Fellow, 1817–1814; Assistant Tutor, 1818; elected Fellow of the Royal Society, 1820; ordained deacon (1820) and priest (1821); Tutor, 1823–1838; author of books on mechanics, physics, geology, astronomy, economics, education, and history and philosophy of science. Whewell was appointed Professor of Mineralogy at Cambridge, 1828–32, and Knightbridge Professor of Moral Philosophy and Casuistry, 1838–55. He was Master of Trinity College from 1841 until his death, and Vice-Chancellor of Cambridge, 1842–3 and 1855–6. Whewell is mostly remembered for his invention of the word 'scientist' and as the author of the third *Bridgewater Treatise*, *Astronomy and General Physics considered with reference to Natural Theology* (1833), *History of the Inductive Sciences* (1837), *The Philosophy of the Inductive Sciences* (1840) and *Of the Plurality of Worlds* (1853). Whewell became Ellis's brother-in-law when he married Ellis's sister, Lady Everina Frances Affleck, in July 1858.

[141] (Unpublished) paper not identified. The first publication of the problem was in an anonymous book review by De Morgan of William Whewell's *The Philosophy of Discovery*, published in the *Athenaeum* on 14 April 1860. (In fact, 'F.G' – probably Frederick Guthrie (see note 139) – wrote a letter to the *Athenaeum*, published on 10 June 1854 in its 'Miscellanea section', in which the problem was introduced. See Brandan D. MacKay, "A note on the history of the four-colour conjecture," *Journal of Graph Theory* 72:3 (2013): 361–363).

[Add.Ms.c.67/104
Robert Leslie Ellis to William Whewell
22 January 18(42?)
Dover]

From Robert Leslie Ellis

Sir,

Accept my acknowledgements for your promptness in communicating to me the impression left on your mind by the perusal of my essay.[142]

I have written to Mr Hopkins who promised when I saw him in Cambridge to make arrangements for the reception of my communication at the commencement of this term, & have told him that if any inconvenience would arise from my change of mind, I am willing to have it read now with an intention of subsequently revising it, in order to render it more fit for insertion in the Transactions of the Society.

My decision will therefore be guided by his answer which I will do myself the honour of communicating to you as soon as I receive it.

If he informs me that I am at liberty to withdraw my paper, I shall be inclined to take that course, & either lay it aside altogether, or remodel it in accordance with your suggestions for which I must again express my thanks.

I have the honour to be Sir,

Your obliged humble sr^{t}

R.L. Ellis

Dover Jan 22 18[42?]

[Add.Ms.c.67/105
Robert Leslie Ellis to William Whewell
11 October (probably 1848/9)
Trinity College, Cambridge]

Sir,

I return to you the proof sheet you have been so good as to send me.[143] I am glad to see that your criticism on Mill agrees so well with what I have tried to express in an introductory essay on Bacon [‘General preface’], whose whole method is based on a reduction of the kind which Mill puts into formulae.

Not having, as I was obliged to confess to you, read much of Mill’s Logic, & therefore not knowing about his algebraical formulae, I have nevertheless been in the habit of translating Bacon’s tables of absence, presence & variation, & his

[142] The essay referred to is most likely ‘On the foundations of the theory of probabilities’, read at the Cambridge Philosophical Society on 14 February 1842 and published in its Transactions in 1844.

[143] The proof sheet referred to is probably (part of) that of Whewell’s *Of Induction, With Especial Reference to Mr. J. Stuart Mill’s* System of Logic (London: John W. Parker, 1849). Whewell had already expressed his differences of opinion with Mill’s views on induction in his *History of the Inductive Sciences* (1837), but it was only after the second edition of *System of Logic* (1846) that he set them out in detail, in *Of Induction*.

Exclusiva into similar symbols. In Mill's case as in Bacon's, the error is plainly the result of the want of a real knowledge of the history of any part of science. If either had known what the progress of science really has depended on, they would have spoken & written very differently. However Bacon's errors are very much more excusable than his successors, seeing that science has now a longer & far more connected history than two centuries ago.

It would not be an uninteresting thing to compare the notion which Leibnitz clung so much to, of a philosophical language, & which in various forms has found favour with so many others – as for instance Raymond Lully – with the notion of codification. Both seem to depend on the same irrecognition of the historical element. That conceptions must to be of value be slowly & progressively formed, & that the state of progress is the most prosperous state of all human things seems to be forgotten by a great number of thinkers, & few errors have tended more to separate what are called practical men from speculators than this. For practical men, whether lawyers or scientists, feel the influence of the past whether they express it in words or not.

I am Sir with much respect

Your obedient servant

R.L. Ellis

T.C. Oct 11

[Add.Ms.c.67/106
Robert Leslie Ellis to William Whewell
8 August (probably 1849)
Trinity College, Cambridge]

Aug 8

Sir

As you will probably return to Cambridge while I am away, I think it well to write to you on the following subject. I am at present Greek lecturer,[144] & it would therefore be in accordance with the usual practice that I should be head lecturer next year. I am of course ready to undertake any office to which the college may appoint me, but I trust you will permit me to say, that I wish to be passed over. To say nothing of my unfitness for the office, I wish to be at liberty to go out of residence during the coming year. Independently of this wish, my appointment would leave the college without a head lecturer from the Commencement in July 1850 to the ensuing October.

I have the less scruple in saying that I had rather not be head lecturer, because the head lectureship is at least much less in the nature of a *leitourgia* [civic duty] than any of the others.

[144] Ellis was Latin Lecturer and, subsequently, Greek Lecturer at Trinity College in 1848–49.

It is not, if I may be allowed to say so, without regret that I address you on a subject so nearly connected in my own mind at least with my final departure from the university:[145] few men I suppose can look back on as many years as I have spent here without much sadness & some degree of self reproach, more especially when that to which they turn has no natural connection with that which they use about to leave – so that the course of life seems broken across. But I must beg you to pardon my saying this much of myself, & to accept my thanks for the kindness which you have so long & so often shown me.

I am Sir with much respect your obed^{t} ser^{t}

R.L. Ellis

[Add.Ms.c.67/107
Robert Leslie Ellis to William Whewell
(probably late-1840s)]

Sir

I have read the accompanying sheets,[146] according to the wish you were so good as to express.

Nothing in the way of suggestion occurs to me with respect to them, except perhaps that you seem to concede too much in the commencement of (21).

Adequate visual organs & a convenient standing place would not be enough to enable one to perceive that the orbit of Mars is an ellipse, or even that he moves in an orbit at all. A being wholly without memory, or without discourse of reason, could not connect the successive impressions on the sensorium by the conception of an orbit. Of course you only mean to admit that the elliptic orbit is a fact, according to the common use of language, but I am not sure that the passage might not be understood as if you agreed with Mill in thinking that to perceive this fact, nothing but the sense of sight, would under certain external conditions be required. What you have said elsewhere would however correct this misinterpretation.

I am Sir, with much respect

Your obedient servant

R.L. Ellis

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[145] As he was not in orders, Ellis's Fellowship expired in 1849.

[146] The proof sheets probably belonged either, as in Add.Ms.c.67/105, to Whewell's *Of Induction*, to the second edition of his *The Philosophy of the Inductive Sciences* (1847) or, as in Add.Ms.c.67/122, to the "new edition" of that work (1858–60). One particular historical example discussed in the Whewell-Mill debate on scientific method was Kepler's discovery of the elliptical orbit of Mars. Mill argued that this was simply *discovered* by Kepler in the data; Whewell, instead, argued that it was a notion or conception Kepler *imposed* on the data in 'a special mental operation' binding together the successive positions of the planets by the idea of an ellipse. For a discussion see, for example, Laura J. Snyder, "Discoverers' induction," *Philosophy of Science* 64:4 (1997): 580–604.

[Add.Ms.c.67/102
Robert Leslie Ellis to William Whewell but possibly to Joseph Edleston
Undated, but from before 1850]

Sir,

I have looked through our collection of Newton's letters, which, as you mentioned to me, the underlibrarian is about to copy. He was in some difficulty about the diagrams, which however I will undertake to draw for him, & also to see that the whole copy is correctly made.

As the mass of the letters relate to the edition of the Principia & involve many points of minute detail they could not as it seems to me be made at all interesting without a perpetual commentary or unless they were interwoven with a commentary on the Principia.

Presented in this manner our letters would be undoubtedly interesting, though only to a small number of readers: But I scarcely feel equal to undertaking such a design, which should be so done as to be a *ktema es aei* [everlasting possession]; & I cannot avoid hoping, that you may yourself at some future time accomplish it.[147] You might well do at your leisure moments that which would require of me long & painful study: I need scarcely remind you that though certainly not 'homo inter homines [huius] seculi occupatissimus' [the busiest man of all the men of this age] I may yet most truly plead that 'infirma valetudo, in quo maximum temporis inest dispendium' [ill health, which causes very great loss of time].

I have the honour to be Sir with great respect,

Your obedient servant

R.L. Ellis

Saturday

[Add.Ms.c.67/108
Robert Leslie Ellis to William Whewell
26 April 1858
Trumpington]

My dear Sir,

Some years ago I troubled you with a note about Kepler's views as to the cause of the motion of the planets. Not long ago a very simple proof that with a natural law the orbit is a conic section occurred to me and I think may interest you. The enclosed is a transcript of what I dictated at the time to Mr Walton – I afterwards solved the case of the inverse curve in a similar way. I should not have troubled you with either but that my method shows that the idea of the [?] of curvature though it arose

[147] The project was carried out by Joseph Edleston, Fellow of Trinity College, who in 1850 published *The Correspondence of Newton and Cotes* (London: John W. Parker, 1850). It might therefore be possible that this letter was addressed to Edleston rather than to Whewell. Another possibility might, of course, be that Whewell forwarded the suggestion to Edleston.

naturally from the history of the problem has really made the solution less simple than it might have been, and might be dispensed with except merely as a matter of historical interest. By and by perhaps the same will be said of the instantaneous ellipse.

I am very much obliged to you for the papers on [colligation?].[148]

Believe me, my dear Sir
Your faithful & obliged servant

R.L. Ellis

Trumpington
April 26 – 1858

[Add.Ms.c.67/122
William Whewell to Robert Leslie Ellis
29 March (probably from 1858)]

March 29

My dear Sir,

I am very greatly obliged by your letter relative to the new edition of my Philosophy[149] which I am now engaged in printing. I was intended to revise the passage to which you refer: and am very glad to be aided by your suggestion to see the proper course of the requisite attraction.

In the new edition I divide the work into three parts. The first is the Historical portion – it includes the metaphysical part of such science. This I call 'The History of Scientific Ideas'.

The second part is the rules for the construction of science, which I venture to call 'Novum Organon Renovatum'. I hope your commentators and students of Bacon will not think this too bold a title. Two centuries of the history of science ought to enable us to renovate the methods of science, even if they have been completely expounded at first.

The third Part I shall call some such name as this: Essays on the Progress of Inductive Method. This part will take in all that belongs to the history of opinions concerning knowledge, in the existing edition; and Ramus among the rest; and there I shall have to make your corrections, and to make many others; and also many additions. I hope in this way to make the work more worthy of the notice which it has received.

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[148] In 1858, Whewell published *Novum Organon Renovatum*, which contained a chapter entitled 'Of the colligation of fact', introducing this notion standing at the heart of Whewell's inductive methodology. The 'papers' referred to might be proof sheets of the chapter.

[149] The new edition referred to is not the 'new edition' (or second edition) of 1847 but the third edition of *The Philosophy of the Inductive Sciences*, which appeared in three parts: *History of Scientific Ideas*, 2 vols. (London, 1858), *Novum Organon Renovatum* (London, 1858) and *Philosophy of Discovery* (London, 1860).

I write this in London but return to Cambridge on Thursday next.
Believe me dear Sir,
Yours with great regard and all best wishes,
W. Whewell

R.L. Ellis Esq.

JOHN GROTE (1813–1866, 3SO Mathematical Tripos and First Class Classical Tripos 1835), educated at Trinity College, Cambridge; B.A. 1835; M.A. 1838; Fellow, 1837–66; ordained deacon (Ely) 1842; Vicar of Trumpington, near Cambridge, 1847–66. Grote succeeded Whewell as Knightbridge Professor of Moral Philosophy, 1855–66, but his influence on younger Cambridge men was mostly through the Grote Club. Author of *Exploratio Philosophica* (1865); his *Examination of Utilitarian Philosophy* and *Treatise on Moral Ideas* appeared posthumously. Having been a close friend of Ellis, who lived next to him at Anstey Hall, Trumpington, from 1852 until his death in 1859, Grote penned 'Robert Leslie Ellis. A study of character', published in the *Contemporary Review* in 1872.

[TCL, MAYOR C12/21
Robert Leslie Ellis to John Grote
25 August (?)
Great Malvern]

My dear Grote

I send you an order for what I think I owe you, viz Cash – 2^{s} / ½ Cr to M. Wells 1.9 / ½ do. to Beacon 3.6 / ½ Turnpikes 6 = 7^{s} 9. I had scarcely time to read over what I sent you, which wanted some obvious correcting – but I had stayed too long on the hill. As I had neither a concordance nor time to find what I wanted without one, I am afraid the scripture phrases or some of them were disfigured. However 'tu l'as voulu, Georges Dandin'.[150]

Nothing new here, except that Sully has asked me to dine with him to meet some Oxford man now staying in his house & that at length I have put myself into communication with my apostolic friends downstairs.

I hope you got home safely & without more indisposition.

What you said of lebensättigkeit[151] [world-weariness] rather sticks in my mind. The word seems misapplied to that kind of dissatisfaction which young men often feel & which arises when one is conscious of powers of enjoyment & of action to which nothing corresponds in one's outward world. It is not that they have had too much of what life can give, but that they feel truly or falsely that it cannot give what they want. Some measure of this feeling seems necessary to a right thinking man for

[150] 'That's what you wanted, Georges Dandin'. A well-known line from Molière's *Georges Dandin* (1668).

[151] Source unknown. Probably 'Lebensätigkeit', which itself is an unusual word in German. One of the very few sources in which it appears is in the chapter on 'absolute idealism' ('Absoluter Idealismus') in Carl Ludwig Michelet, *Geschichte der letzten Systeme der Philosophie in Deutschland, von Kant bis Hegel. Zweiter Theil* (Berlin, 1838), 767.

we are not 'old Adam's likeness set to dress this garden'[152] of the world but bear about with us to use Pascal's phrase 'les misères d'un grand seigneur d'un roi dépossédé' ['The miseries of a great ruler and of a dethroned king'].[153] No doubt this feeling is often & in a variety of ways diseased, & no doubt also whether diseased or not the business & cares of life may serve to obliterate it, as they may to obliterate all other feelings connected with our spiritual nature.

Different from this lebensättigkeit if it be so called is the desire for rest, or at least the sense of weariness in men in whom the vis vitae is not very strong, certain forms of habitual uneasiness will sooner or later produce. But I do not think we are likely to agree on this subject: how we manage to agree on so many is to me all things considered a mystery.

Ever yours

R.L. Ellis

25 Aug
Great Malvern

[TCL, MAYOR C12/33 54
Robert Leslie Ellis to John Grote
6 April (from before 1849)]

My dear Grote

I hope you have escaped from all your troubles & are pretty well again. Walton talks of coming this week & as he is willing I know to take charge of them, could you conveniently leave the Bacon papers at the porter's lodge in order that he may bring them to me? – not that I am at present likely to work at them, but I mean to toy.

Mill's Logic & the Anglo-Saxons he would also undertake if you are not using them, & the latter if not both I should probably have done with before you come here, so that you could have it back at I hope, not a distant time.

I believe he would set out Thursday.

I am going on as before, staying in bed occasionally with little feverish attacks, & a great deal of stiffness. But if the weather keeps fine I hope to avoid any permanent laying up – permanent it would be if I once began it. Still dressing & going out have come to be intolerably painful. I was reminded a day or two ago of what I told you of, that being at Dance's before I went abroad, I took to myself his sister's accidentally saying 'the autumn has set in very soon' – by his bringing her here, he is now established near Bath.[154] Whatever doubt there was about it then there is none now. You listened to this story with patience though you abused me for trying the sortes.[155]

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[152] Shakespeare, *Richard II*, Act 3 Scene 4.

[153] Pascal, *Pensées*, 1:3.

[154] George Dance (Peterhouse 1843), B.A. 1848; perpetual curate of Swainswick, Somerset, 1851–60.

[155] Divination by lots.

Tom Spedding[156] & Frederick Myers[157] have drawn up two addresses to the Queen: the former for laymen, the latter for clerks, both against what they would call Puseyism.[158] I take it Myers set Spedding to work & wishes himself to attract notice & favour. The prayer of his address is that the book of C[ommon].P[rayer]. may be made more scriptural. He is a worldly & somewhat mean man. James Spedding sent them to me – I suppose supposing I should sympathize – so little do people understand one another. He said gravely 'it would be an important first step if all who do not believe that priests can forgive sins would say so'. For my own part I am not very fond of declarations of belief but declarations of unbelief are surely a great deal worse. I told him I had been told in my youth that the Hindoos say the Deity delights in diversity of worship, & that I thought the saying might apply to Ruseyites & Evangelicals.

I hope to see you soon. With kind remembrances to your house, I am

Ever your's affec^{y} R.L. Ellis

Bath Apr 6

[TCL, MAYOR C12/24
Robert Leslie Ellis to John Grote
26 January 1850]

My dear Grote

I have rather repented having written to you as complaining as I did, as I am bound to believe you are enough for me to be pained by my letter. It was unlucky that I wrote on one of the most suffering days so far as the heart is concerned that I have had. Since then I have been nearly free though not quite a change which gives reason to hope that there is not at present any organic mischief. But I have seen terrible suffering of the kind without it. However sufficient for the day. I remain in bed & likely to stay there, & still can hardly turn. We put on leeches tonight, & my doctor delights on them, loves as the conqueror loved the deer: 'as if he were their father'.[159]

I have been reading Hallam both the middle ages & the history of literature.[160] His style is certainly very bad, a mixture of Gibbonism[161] & slipslop – the latter preponderating in the history of literature. He talks too flippantly of things he knows

[156] Thomas Story Spedding (1800–1870) Trinity Hall 1818, the elder brother of Ellis's Bacon collaborator James Spedding.

[157] Frederic Myers (1811–1851), Clare Hall 1829, vicar of St John's, Keswick.

[158] The addresses have not been identified, but were probably published anonymously.

[159] From a description of William the Conqueror in the Anglo-Saxon Chronicle.

[160] Henry Hallam (1777–1859), English historian educated at Christ Church, Oxford. Henry Hallam, *View of the State of Europe during the Middle Ages*. 2 vols. (London: John Murray, 1818); Henry Hallam, *Introduction to the Literature of Europe, in the Fifteenth, Sixteenth and Seventeenth Centuries* (London: John Murray, 1837.

[161] 'Gibbonism', or 'Gibbonian', refers to Edward Gibbon, the eighteenth-century English historian, politician and writer, author of *The History of the Decline and Fall of the Roman Empire*.

very little about. The constitutional history is much the best of his works. In addition to the books I mentioned I wish you would see whether a Strasbourg Vitruvius of 1550 is in Cambridge.[162] Also Meigret's book, on French grammar published about 1570.[163] Also Raymond Lebonde, either in the original Latin which is rare, or in Montagne's translation.[164] I am ashamed of asking you to do all this, but there is no hurry about it, as I know not how long it may be before I get to Paris. For Victoria's Reflections I mean to look when I get to Lyon where there is a large library an edition of it having been published there.[165] At Nice there are some curious books & intelligent people attached to the library. Victoria is the only schoolman whom Bacon has ever quoted.

Have you any notion why Consuls in sea ports came to be so called? Or did you ever see the Barcelona treatise on ma[rine] law called it Consolato del Mere?[166] The 1st book of the kind. You need not answer these questions but do write some time or other about the books.

I am thinking if I were to get well & Bacon not in the way, I would write an essay on legal realism: on the influence on English law especially of the habit of mind which gives to mere abstractions entia rationis an objective reality, so as to make a sort of parallel between orthodox scholasticism & the development of the common law both being the work of men who in an unabstract age or ages were set to deal with abstractions.

Excuse scribbling, my right arm is greatly out of order.
Yrs ever R.L. Ellis

Jan 26
[TCL, MAYOR C12/25
Robert Leslie Ellis to John Grote
12 February 1850]

My dear Grote

I got your letter yesterday, brought to me from Nice by a cousin of mine who when he heard I was ill very good naturedly set out to come to me, & who made the journey from England in nine days, in spite of a delay on the Rhone from too much water. I had proposed to him to come abroad with me at first, but he could not. Else, or rather hitherto I have been perfectly alone.

The rheumatism is getting slowly better. I can walk a step or two without help – not without risk of falling. But I cannot get rid of the fever. It goes away for a day or so – then comes back, in spite of a low diet & medicine. On Sunday, it came on so sharply & with so much distress at the heart, that I have not been so

[162] Vitruvius, *De Architectura Libri X* (1550).

[163] Louis Meigret, *Le Tretté de la Grammere Francoeze* (1555).

[164] Not identified.

[165] Francisco de Vitoria, *De Indis et De Iure Belli Relectiones* (1557).

[166] *Il Consolato del Mare*, a fifteenth-century treatise on commercial maritime law, first printed in Catalan in Barcelona in 1484 ('*Llibre del Consolat del Mar*') and translated into Italian in 1519.

uncomfortable for a considerable time. The doctor stifled the excitement of the heart with digitalis – I doubt if it be good practice; today I am again feverish but the heart is quiet, though I am troubled with a mechanical half sign half sob from time to time, which I believe indicates congestion at the heart. The doctor at Nice seems to ascribe the mischief there to overbleeding. I sit up enveloped in blankets a hour or so every day. This week I hoped to have got to Nice moyennant [by means of] a bed put up in a carriage, but it seems now impossible. Of the French phrase aimant used adjectively is I believe modern French, Chateaubriandish – it is rash to criticize without knowing the author; but I should have said 'on n'est l'un & l'autre que rarement' ['one is rarely both one and the other'] or 'on est rarement l'un & l'autre' ['one is rarely both one and the other'], tous les deux [both] requiring I think antecedent substantives. The antithesis of aimant & amiable is rather skew, considering the limited sense aimable has in French.

Poor Armitage's state is distressing.[167] The only comfort, & a sad one, is that the decay of nervous sensibility: the building up of death in life, probable makes him comparatively indifferent to his own ailments. The blindness is I suppose nervous – loss of sensibility caused by the fever, & nowise likely in his case to be regained. Poor fellow, if he had not got his fellowship, he might have been in good health – nocitura petuntur [harmful things are prayed for].[168] Do you remember him that night at Hareside,[169] as happy apparently as he could be? 'E'en such is time who takes in trust, our youth our joys our all we have, and pays us but in age & dust.'[170]

I have got Biagioli's Dante[171] at my bedside, having borrowed it from my doctor, or rather from a friend of his. A good commentator, qua the grammatical exegesis, but flippant & French, quotes the writings of Cabanis[172] – whose gross materialism is certainly not sympathetic with Dante. Biagioli was a teacher of Italian at Paris & says he loved France like Italy – which again is not in the spirit of Dante. I have been reading a great deal of Giannone's Naples & some of Macchiavelli's Florentine history. But after all the history of the Italian republics is not to me at least interesting. There seems no principle involved in their eternal troubles – there is no making a theory of them, or remembering them, and there seems nothing but selfishness & wickedness through out. No such battle as that of Morgarten,[173] or assertion of rights & justice, like the early legislation of Spain & England; not even the spectacle of the gradual formation of a great nation as in France. Nationally the Italians seem always

[167] James Armitage (1818–1852), Caius 1839, migrated to Trinity College in 1841; B.A. 1843; Fellow 1845–52.

[168] Juvenal *Satires* 10.8.

[169] A village in Northumberland, perhaps the site of a reading-party.

[170] Sir Walter Raleigh, 'E'en such is time'.

[171] G. Baigioli's *Dante, with a new Italian Commentary* (Paris, 1818).

[172] Pierre Jean Georges Cabanis (1757–1808), French physiologist and materialist philosopher who believed that thought is the function of the brain.

[173] The battle of Morgarten (1315) was the first great military success of the Swiss Confederacy against the Austrian Hapsburgs.

contemptible, though they had amongst them many of the foremost men of all the world.

Between ourselves, Blakesley's conduct is the more ridiculous that when last year, Arch[deaco]^{n} Allen proposed at a Sterling dinner to change the name he put himself forward to oppose it, & moved the previous question, on which Allen was left in a minority of one.[174] Of all the party he took the lead in opposing the change. I am not quite sure however he did not say a time might come when the question might be fully entertained. The right time in a Xian point of view to change the name was when it was giving scandal & not when one had private ends to serve.

I have been occupying myself with some logical speculations which I think, if I get tolerably well, I shall give to the Philos. Society – that is if I find they are new. The chief subject being asyllogistic inferences, of which there are a vast number, incapable of being reduced to the rules of common logic, because dependent on other fundamental principles than the dictum de omni & nullo [everything and nothing]– or in other words on other subordinations than those which are in lineâ predicamentali.[175] They occur constantly both in geometry & algebra. Remember me to Mrs Latrobe & Miss Grote. I am delighted at the prospect of seeing the Labrador boots.[176]

Ever aff. yrs R.L. Ellis

[TCL, MAYOR C12/27 62
Robert Leslie Ellis to John Grote
2 March 1850
Nice]

Mar 2 1850
H. de la Pension Anglaise, Nice

My dear Grote

I cannot write a long letter just now. Many thanks for yours. Pray ask Hoppett[177] about the books out in my name. I did not think there were any.

I came here the 16th bore the journey well, & thought I was to get well. Since then has been a great deal of harassing pain, & I fear increasing weakness. Travis[178] is disposed to think there is something wrong in the spine. So it is I can scarcely rest – sometimes not at all when I have once sat down, & cannot sit up for more than

[174] The Sterling Club had been founded as a dining club in 1838 by John Sterling. Controversy later arose because of his heterodox theological views, and after his death in 1844 attempts were made to change the club's name. In 1849 John Allen proposed that the name should be changed, but the majority of members disagreed and resigned from the club, whose name was later changed to the Tuesday Club. See Peter Allen, *The Cambridge Apostles: The Early Years* (Cambridge: Cambridge University Press, 1978), 182–97.

[175] The order of predicates, a scholastic term.

[176] Boots made of sealskin.

[177] Ellis's servant.

[178] One of Ellis's doctors.

a few minutes without intolerable pain. The heart as it was; Travis says the sobbing only shows weakness & not necessarily any disease.

Since I came here I do not read, at least very little; lie & doze all day, & feel wonderfully unlike myself, terribly broken in every way. But I get up before breakfast & dress, with some one to shave me & another to do my hair, which however I can now comb myself. So my habits are more like health than they were which is always something. But my general strength seems as yet to lessen instead of increasing, & Travis is less sanguine about me than the Italian.

I reflect in the night watches & also interdiu [from time to time], that I am not so young as I was – have had a tolerable spell of tolerable health & might be much worse off, if only in not having means sat superque [enough and more] for making myself externally comfortable.

The weather is glorious to look upon, though I am told harsh: the land is full of flowers. The Hotel where I am is quiet & comfortable & my cousin is very attentive. I do not like keeping him but must do so, as he will not I think leave me, & as I cannot hope to move for a long time.

I have some thoughts of giving up Bacon, but do not want it talked of as yet until I have written to Spedding.[179] I will not give it up if I can fairly help it.

So you are reading Cervantes – nearly as treacherous as Ariosto I should think. Florian's French version is expurgate I believe; it was the first I read.[180] Since I have read Motteux, which is certainly coarser than my recollection of Florian.[181]

Except mathematical books, all are more or less objectionable.

Shall I bring you a palm tree stick? Endogenous timber is not common in England, & the stick is a good stick, though it generally has an extraneous crook of orange or olive wood – both of which make pretty sticks. Remember me to yr party. Ever aff yrs R.L. Ellis

[TCL, MAYOR C12/28 61
Robert Leslie Ellis to John Grote
14 November 1850
Brighton]

Nov 14 1850
Belgrave Place
Brighton

My dear Grote

Thank you for both letters: I wish I were well enough to accept your kind proposal, but I must be mainly alone until I am somewhat better 'if that event ever take

[179] James Spedding (1808–1881), English author and Cambridge Apostle, chiefly known as co-editor of *The Works of Francis Bacon* (1857–1859) and *The Letters and Life of Francis Bacon* (1861–1874). Educated at Trinity College, Cambridge; B.A. 1831 (Second Class Classical Tripos and JO in the Mathematical Tripos).

[180] The translation by Jean-Pierre de Florian, published in Paris in 1799.

[181] The English translation by Peter Motteux, published in London, 1700.

place' as a lady I know said once in speaking of the death of her husband's father, who lived on in a way or rather to an extent which provoked her.

I think of going to Bath early next month; ten days ago came Sanders Watson & his brother,[182] & I made it up with the former – not that we had any difference, except that I was vexed with him, & he is without all question an odd man: and so he is going to look at a lodging for me at Bath & to write to me about it. I doubt if I should want a servant if I go to the lodgings in question: as far as womanly attendance goes I am sure of having as much of it, & as kind as one commonly meets with.

I have had an interview with Mrs Hicks who came over to show me her fine clothes & to pay me what she owed me. Certainly prosperity fattens & smooths the human face: hands however do not recover from hard work so fast if at all. We used to wonder that is Marley & I how she could be the mother of so very pretty a little girl – now there is almost a likeness. She used three words worth notice 'answered him quite stunt' q.d. short as in stunted. 'buffled away all his money' – a charming word I think – & then speaking of Hoppett's hall voracity 'how he cld have such an appensity'.[183] Did it ever strike you that naiveté is from nativies, used in low Latin & no doubt in French for a villain like the English neif for native? So that the word means the low way of talking & thinking – etymologically the opposite of gentleness though in modern use they often go together.

I have spent more money with that agreeable person Mr Gancia than I at all intended – want of something to do leads one into expense; after all I have not bought very much.

My cold hung about me a long time & last week I was ill enough to think Cayley had given me the smallpox – now if I were less hypped & more able to sleep I should be better than since you were here.

Remember me to your household.

Affectionately yrs R.L. Ellis

[TCL, MAYOR C12/29 64
Robert Leslie Ellis to John Grote
(1?) January 1851]

My dear Grote

If you want good news about me, you must make it for yourself. What I seemed to gain in general comfort on coming here, I have lost & in power of moving &c there is no change. I have been rather below the average than above it. Still Gore says that if I do not get another attack there is reason to think the condition of the limbs will ultimately improve.

[182] Members of a Bath family known to Ellis since his boyhood.

[183] A voracious appetite.

As for your sermons I should like to know what they are to be about: preaching at S. Mary's has always the air of tight rope dancing, the performer keeping his eye on the V.C.[184] to steady himself.

I got at Brighton Rossetti's book on Dante.[185] Have you read it? It seems to me full of disagreeable nonsense: acute enough here & there, but onesided & credulous – credulous too after a vulgar fashion – ready to believe anything that calls itself a mystery or a secret, and withal without any true appreciation of Dante as a poet. The best part of it is that is shows how much in Dante & others, political theory was blended with religion so that for the papal theocracy they wanted to substitute a theocratic imperialism. But that which is especially new namely that the religion was merely a pretext & jargon & that Dante & Boccacio &c had no religion except a theophilanthropy, common to them with the Templars the Albigenses, Oliver Cromwell, Emanuel Swedenborg & the Freemasons seems to me utter dreaming. Do you know anything of Arrivabene's Secolo di Dante?[186] I am thinking of getting it.

If you do come here, I need not say you will be welcome & I hope comfortable – you know probably whereabouts I am just at St Crescent end of Brock St, not however on the best side, but still with a scrap of view up to the hills – I see the mount where Monmouth raised his banner, before he summoned the town, which was wise enough to keep him out. I have not been up to see Sir [Basil?] Grenville's monument which still shows a scrap of Clarendon in his praise, or did some years ago.

Well. I may as well wish you a happier year than it can be to me; & so adieu.

Affectionately yrs

R.L. Ellis

Jan [1?] 1851

[TCL, MAYOR C12/30 (1) 56
Robert Leslie Ellis to John Grote
23 January 1851
Bath]

My dear Grote,

Touching Arrivabene I had a notion he wrote after Rossetti & in refutation probably of him: that not being so, I do not care, thank you, for his book though I should like to have your opinion of it. I am coming to believe that at least in Petrarch amor & morte are often put antithetically for imperialism & papalism, (if there were such a word). That I think is nearly as much as one can concede to Rossetti's interpretations: he gets so wild as to hint that when Marco Polo talks of the Can of Tartary, he covertly alludes to Dante's Veltro. Lyell, the father of the geologist I believe, was his patron & furnished him with an anagram Veltro = Lvtero: so you see Dante was

[184] The Vice-Chancellor.

[185] G.D. Rossetti, *Dante and his Circle*, first appeared in *The Early Italian Poets from Ciullo d'Alcamo to Dante Alighieri* (London, 1861). Nothing earlier than 1861 has been found.

[186] F. Arrivabene, *Il Secolo di Dante* (Monza, 1838).

after all no better than a protestant. Apropos to which I may tell you that I hear Prince Albert & Bunsen are engaged on a revision of the Common Prayer.[187] Has any rumour of that kind reached you at Cambridge? I hope you would nonjure, if a fair opportunity arose.

I had rather an amusing passage here the other day. Dr Logan,[188] a catholic priest was with me, when there came in a little clergyman, a connection of mine who had come to Bath for a few days. He took Logan for a clergyman of the English church & pompously introduced his opinions as to the necessity of a diaconate. 'It is common thought when a man is once ordained he is fit for any duty whereas &c.' 'Doubtless a great mistake' said Logan with most edifying gravity.

Logan has a capital library both of mathematics & philosophy & is liberal as the day in lending – unfortunately, Prior Park is up a long hill & I cannot get out of the carriage without great distress.

Added to which Gore begins to think I had better stay at home, which is a bore, now I have a carriage &c of my own, which ought to be used. I have been laid up this week with a feverish illness, & today only came down at three PM. However I am getting rid of it. For many days before I had been more wretched I think than at any time since I left Nice & was rejoicing neither you nor any body else was coming here while I was so uncomfortable: all the limbs tend to increased contraction, in spite of any thing one can do to stretch them. There is clearly some constitutional malady now going on – not merely the remains of the mischief done last winter & so thinking I believe I shall go to Malvern 'when the green leaves come again' – the malady being not manageable by common treatment. Gore would rather encourage me to do so, if I asked him, & at any rate it is 'experimentum in animâ vili' [experiment on a coarse soul]. I do not want much to lengthen my days, thinking it very improbable than I can get into a state in which my life would not be a burden: in truth before this illness I have often so felt it during the last five or six years – but while it lasts it is worth trying to make it less uncomfortable.

The great point is not to think much about oneself, especially, to which by the way I am rather tempted here by old recollections not to think about what one might have been or how one might have been, if so & so had been different.

Is not diner, in Provencal disnar, a corruption of disjejunare? (it seems to be often spoken of as the first meal – I mean the substantive dinner). I am satisfied now that bachelier meant originally simply puber, adolescens. If you connect it with the German beschäler, I think you will see its first meaning. I ought to apologize perhaps for introducing so coarse a word, as you are scrupulous in such matters.

[187] See Martin Wallraff, "The influence of the Book of Common Prayer on the work of C.C.J. Bunsen," *Journal of Theological Studies* 48 (1997): 90–107.

[188] Rev. H.F.C. Logan (1800–1884). See Ellis's diary entry for 22 August 1839 and Verburgt's chapter in the present volume for more information.

I know nothing about the Tesoro, except that it is in French (not Provencal) so that possibly it may have a French title Tresor or something in that way. It is Mr Wood's opinion, you know he lived with the C[hief] Baron, that Pollock[189] is 'a howl of a man'.

Forgive so long a letter, & remember me to the ladies of your house.

Ever most truly yrs

R.L. Ellis

Saturday Jan. 23, Bath

[TCL, MAYOR C12/32 55
Robert Leslie Ellis to John Grote
4 September (1851?)]

My dear Grote

I had your letter yesterday – many thanks for it. I had had so bad a night with feverishness & my face teeth all aching & spasmodic pain in the chest &c that I was not much in the humour for writing. Today I am better though very helpless.

I have not been in town, last week I was going, but prevented by indisposition – & after all I had no great motive; I shall not I think trouble myself trouble myself [sic] to see Brodie or any one else – I am 'but a gone coon'[190] – & it is very disagreeable to tell one's story to a new person & to have a judgment passed.

As you go home it might possible for you to come this way. I am afraid my going to your house must be given up – it would be such discomfort to me in the state I am in – not that it is different from what you saw; but when the prospect comes nearer all details of distress & difficulty are better seen. As for Anstey Hall, the more I think of what I know of the house the less it seems likely to suit me, & if, as is probable, I get worse, I should in a doubtful or suspected climate blame myself for settling there.

I am more likely to settle here if anywhere:– if the coming winter 'tribuit Jupiter ultimam',[191] it would save trouble & suffering: nobody wants me & I am sure I do not want myself in the world.

Cayley's brother has published a translation of the Inferno; he sent me a copy.[192] Write & tell me of your movements.

Yrs affec^{y} R.L. Ellis

Sep 4

[189] Sir Charles Pollock (1823–97), Chief Baron of the Exchequer 1841–68.

[190] A slang expression, meaning that it was all up with him.

[191] 'Whether Jupiter has allotted you a final [winter]'. Horace, *Odes* 1.11.

[192] C.B. Cayley, *The* Inferno *in the Original Ternary Rhyme* (London, 1851).

[TCL, MAYOR C12/31 42
Robert Leslie Ellis to John Grote
Undated, but probably from 1851/2]

My dear Grote

I think as much I have read of the pamphlet excellent, dignified as well as severe & but seldom strictly speaking personal that is involving little derived from your knowledge of Shilleto's personally. The phrase at p 81 'as an oracle or as a butt' is an exception, but I cannot regret it.[193]

I am thoroughly uncomfortable. Hargreaves has taken to giving me another form of opium & probable a longer dose. It has given me the extreme relief of nights, not so much of sleep as of comparatively painless reverie. But between the angry feverishness of the complaint, & the disturbance of head produced by opium & that due to the medicine taking which it necessitates, I eat hardly any thing & feel comme si je couvais une grande maladie ['as if I am very ill']. The opium seems rather to have given power of motion. I made an attempt to stand two days ago with sticks &c, but absolutely could not. I wish I was at A[nstey] H[all], so much more private than here &c & the house is droughty. But I have not been out for weeks.

The opium affects my mind & has given me far off hints of the possible return of that old hypochondriasis which has often made me say 'Thy terrors have I suffered from my youth up, with troubled mind'. I do not want, to quote one of Macaulay's, to be 'overthrown by fatal diseases, & yet more fatal remedies',[194] & as you probably know, have had one terrible warning, (an old but never rightly healed wound: of what with a nervous temperament opium may produce. I remember Dr Watson however who is a safe adviser spoke of an opiate treatment as a thing that can do me good.

As in a certain sense I live with you, make me a subscriber to yr school. I will give 2 guineas or what Forster gave whichever is most, & if at yr convenience you will tell me what thus far I am indebted to you, the acc^{t} may as well be balanced.

Kindest remembrances to Mrs Latrobe & Miss Grote.

Aff^{y} yours R.L. Ellis

I will write to you if I get any better. I must always & sincerely be glad to see you – but more if I were less suffering.

T. W. Wednesday

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[193] John Grote had just published a pamphlet in response to Richard Shilleto's attack on his brother George Grote's *History of Greece*, *Thucydides or Grote?* (Cambridge: John Deighton, 1851. In it Grote declared that Shilleto's 'deliberate schoolboy impertinences' might have been 'struck off in the excitement of the applause and laughter of any who might look to Mr Shilleto as an oracle or as a butt' (John Grote, *A Few Remarks on a Pamphlet by Mr Shilleto, Entitled 'Thucydides or Grote?*, 81) For the context, see Christopher Stray, "Thucydides or Grote? Classical disputes and disputed classics in 19th-century Cambridge," *Transactions of the American Philological Association* 127 (1997): 363–71.

[194] Thomas Babington Macaulay, "Review of Sir John Malcolm's *Life of Lord Clive*," *Edinburgh Review* 70 (1840): 295–362, on p. 361.

[TCL, MAYOR C12/37
Robert Leslie Ellis to John Grote
Undated, but probably from after 1851
Great Malvern]

Festa.Resti.
Apsley Villa
Grt Malvern

My dear Grote

I write to tell you of my arrival here which occurred on Tuesday. I then went to Wellington House, where I was uncomfortable & so, paying for a week, in two days removed here – an out of the way house near the Worcester gate, which I am afraid will hinder Sully from coming often to see me. I do not mean the Gate will hinder him but the distance. However he says not, & the bathman encourages me by saying that as I am so well known in Cambridge (Thompson told him of me last year) Sully would be particularly pleased at any success he could achieve. He Sully thinks he can do some thing, & I am better since I came, only I fear for the change & not very much better. But we shall see. I eat no animal food, & stay in bed until eleven, going however early to bed again. At Bath I went on pretty much as you saw me, a shade more comfortable in myself, but with another feverish fit &c.

You were quite right about Armitage, & he being satisfied every body is – I was particularly weak at the time he wld have been at Bath, so as not to be able to sit at a table for more than a few minutes. Consequently my Chinese alphabet of radicals[195] has not been finished. A great friend of mine in undergraduate ante undergraduate days & indeed in later times, has been in Bath where his mother mostly lives, & is going to get me S. Matthew in Chinese. I have seen a copy of it. So if I am ever able to go to church again, I may read the lesson in Chinese, as some good people do in Greek. Fancy Dr Sanders Watson whom you know remarking that Chinese seemed very like Persian. I think it is nearly as good as my cousin's notion about King Otho & Constantinople. With kind regards to your household. Affec^{y} yrs R.L Ellis

[TCL, MAYOR C12/38 52
Robert Leslie Ellis to John Grote
Undated, but probably from after 1853]

My dear Grote

After you left me today I was sorry I did not thank you for the kindness which made you choose this time for going away & that I did not say how much I have been afraid of being in such like respect of restraint to you. Nothing could distress me more & if you consider that this time last year I was at Bath & seldomer visited than I am here from Cambridge, setting Trumpington aside, & that I am as well able

[195] Roots. Reference is to Ellis's 'Some thoughts on the formation of a Chinese dictionary, and on the best mode of printing Chinese. In a letter to the Rev. J Power, M.A., Fellow of Clare Hall, and University Librarian', which was printed for private circulation in 1854.

to do without society now as then, & in fact can enjoy it much less – you will see there is no reason for letting me be a burden to your kindness.

Do you remember during Lefevre's election my going to Trumpington with you & waiting for you at the door of this house?[196] – & how when we got back I was summoned to London? It is five years ago this day, which should be the anniversary of a great grief.[197] That it is not was one of the misfortunes of my life; the greatest of all, next to the misery I am now in.

Will the cousins go one as usual sitting up on the sofa like two lovebirds on a perch & talking to one another in whispers, which may be good manners though I rather think it is not, but is certainly very tiresome: and without any thing to say except the aforesaid whispering: I feel regularly taken possession of; & how long it is to last cannot be foretold. Out came Bradshaw[198] so I had some hopes, but it was only for an excursion to Ely.

The books came right.
Affectionately yrs

R.L. Ellis Kind regards to Mrs Grote

WILLIAM WALTON (1813–1901), admitted to Trinity College in 1832; B.A. 1836 (8W); Fellow and assistant of Trinity Hall, 1868–95. One of Ellis's closest friends, Walton collaborated on editing the *Cambridge Mathematical Journal* with Ellis and would edit *The Mathematical and Other Writings of Robert Leslie Ellis*. A mathematical coach and author of several textbooks and collections of problems. He was known for his eccentric dress and long beard, which led to his being locally nicknamed "Old Father Time".

[TCL, Add.Ms.c.67/55
Robert Leslie Ellis to William Walton
5 August 1847]

63 Westbourne Terrace
Hyde Park
Aug 5, 1847

My dear Walton

You probably saw the announcement of my mother's death. I write to you now about a very trifling matter connected with it. She had had for some years a dog – originally belonging to a brother of mine who died as you remember about four years ago. My sister is going abroad for some little time – I do not think I shall go with her – but whether or not – there is now no place to which to consign this unfortunate brute, unless some friends of hers who were talking of setting up a dog are

[196] The election campaign of summer 1847, in which J.G. Shaw-Lefevre stood (see *Romilly's Diary, 1842–1847* (Cambridgeshire Records Society, 1994), 205, 210, 219–20).

[197] The 'great grief' refers to the death of his mother, who was buried in Bath on 28 July 1847. The greater grief implied is that caused by his father's death in 1842.

[198] The standard railway timetable.

willing to take charge of it. Now you would render a very great kindness both to me & to my sister, if in this case, that is if they will not, you would let me trust the dog to you. It would only be a temporary arrangement. The dog is a lady dog but has hitherto had no family & I dare say never will. She is a black rough haired terrier, used to society, or at least to living in the drawing room, unexceptionable in point of conduct, delicate in her ways, & when she had made friends with people most patient & enduring: it is impossible to put her out of humour.

She is a little timid at first & méfiante [distrustful], that is when she does not fancy people – but never really cross.

I know I am asking a favour but I have so few friends that those I have must forgive my being troublesome.

Say every thing for me to madame.

Yours ever

R.L. Ellis

[TCL, Add.Ms.c.67/56
Robert Leslie Ellis to William Walton
29 October (probably late-1848/49)
London]

Ox.&Cam.Club[199]
Monday Oct. 29

My dear Walton

I have thought of you so often since I went away that at length the thoughts shape themselves into a little letter – not that I have much to say, not having as yet seen any of the wonders of foreign ports – unless Hampshire be counted foreign. I saw in Suffolk a terrible incendiary fire in the village near which I was staying, & got my best hat burnt there, much as the old one was at the Cambridge fire.[200] There was a barn perhaps 150 foot long full of corn to the rooftree & burnt right down when it began & there was a dinnerparty at the house in which I was, my sister's father in law's;[201] the party however I left & as I tell you got my hat burns without doing much good to any body, & harm to my own finances in that I expended certain sums in beer – not for my own drinking.

I mean to leave town in two or three days, more than half sadly. I leave my brother in law, not known, in the most deplorable health – broken down in everyday, omni membrorum damno major dementia [worse than any physical decline is the

[199] Oxford and Cambridge University Club, a traditional London club, founded in 1830, located since 1838 at 71 Pall Mall, London. It became the Oxford and Cambridge Club in 1972, when it merged with the United University Club. Only in 1996 were women allowed full membership.

[200] Probably the 1838 fire that destroyed some of Ellis's diary entries.

[201] Ellis's elder sister Everina Frances married Sir Gilbert Affleck (1804–1854), 5th Baronet, the son of Rev. Sir Robert Affleck, 4th Baronet, and Maria Impey. They were of the Affleck Baronetcy, of Dalham Hall, Suffolk.

dementia],[202] the result of gradual & inevitable paralysis.[203] Certainly my sister's life is one of the many which 'begun not unprosperously have come down to a narrow prison & a long ignoble bondage'.[204] However there is no use in talking of these things.

I missed Chesterton terriblement the first Sunday. I was away & a good deal yesterday – & even now begin to think how nice it will be when I come back if it pleases God that we should meet usual in the spring. The worst of it is that with kind friends like you, one gets intolerably egotistical – neither you nor madame know how near you have been once or twice lately to a long chapter of private history, of which the result would perhaps have been that you would think less well of me than now – but still better probably than I deserve.

In the common world one has no similar temptations; it would never do to go about either talking or thinking of oneself.

I will write again when I get settled anywhere: meanwhile if you are kind enough to write & feel inclined to do so: address to me Poste Restante Orange. Do not write if you are busy & think it a corvée. So now goodbye, & say everything for me to Mrs Walton.

Ever yours (in haste)

R.L.E.

[TCL, Add.Ms.c.67/10
Robert Leslie Ellis to William Walton
Undated, but from (early) 1849]

My dear Walton,

Wood's[205] way of treating inverse probabilities is the common one & is quite correct, on the principle assumed, namely that the different hypotheses (as to the causes) which may have given rise to the observed event, were a priori equally probable. The question then reduces itself to this: is this principle itself correct? Wilbraham[206] says no. I should say that taken abstractedly, it is neither correct nor incorrect, being an admissible assumption & nothing more.

To understand distinctly what is meant by equal probability a priori, let us take the following case. A person is supplied continually / by some contrivance into the nature of which we need not enquire / with a succession of urns each containing two

[202] Juvenal, *Satires* 10.232–3.

[203] Sir Gilbert Affleck would die on 18 November 1854 in Calverley Park, Tunbridge Wells.

[204] 'Her life, begun not unprosperously, had come down to this – to a mean prison and a long, ignoble bondage': William Makepeace Thackeray, *Vanity Fair: A Novel Without a Hero* (London, 1848), 514.

[205] James Wood's popular elementary textbook *The Elements of Algebra* contained a chapter on 'Chances' discussing 'direct' and 'inverse' probabilities.

[206] Henry Wilbraham (1825–1883, 7W 1846). His main contribution to probability theory lay in his 1854 criticism of George Boole's method of treating (inverse) probability in the *Laws of Thought*. No publication from (before) 1849, the year of Ellis's letter to Walton, has been identified.

balls. Some urns which I call *m* urns contain two white balls, & some, which I call *n* urns, a white & a black. Suppose *m* urns & *n* urns are on the long run supplied in equal numbers. Suppose A draws (& replaces) a ball from each urn that comes to his hands, & passes on every urn from which he draws a white ball to B.

B now proceeds to a second drawing: in what proportion of urns does he get a white ball? The question is answered by observing that all the *m* urns come to his hands, &, on the long run, half the *n* urns. These two classes of urns being equally numerous, two thirds of all the urns he [*illegible*] are m urns & one third n urns.

From all the former he gets white balls, &, on the long run, from half the latter, so that he gets white balls from $(\frac{2}{3}+\frac{1}{2}\text{n}\frac{1}{3})^{\text{ths}}$ or $\frac{5}{6}^{\text{ths}}$ of all the trials he makes. That is in any single trial the chance is $\frac{5}{6}$ that he draws a white ball. And this is the common result. There is nothing precarious in the process of obtaining it, except the assumption that A is supplied with equal numbers, on the long run, [*illegible*]. This is in the accurate sense of the word precarious being mere matter of convention. If indeed we make any special hypotheses as to the way in which he is supplied with urns then the case is changed. Failing any such hypotheses, we may suppose both kinds to come to his hands with equal frequency – or in other words that *m* urns & *n* urns are a priori equally probable.

This supposition is inconsistent with (our) supposing that of the urns in which he finds a white ball & which he passes to B, as many are *n* as *m*. In order to this the frequency of supply to A of *n* urns must be twice as great as that of m urns: or the probability, antecedent to the first drawing of the former class twice as great as that of the latter.

In this use, which may be more simply conceived by supposing A to supply B with urns by putting a white ball into each & then a second ball, which is as often white & as black, the chance of B's drawing a white ball is not $\frac{5}{6}$ but $\frac{3}{4}$. It is manifestly $\frac{1}{2}$ that he draws the white ball A put in, & $\frac{1}{2}\times\frac{1}{2}$ that drawing the other he still draws a white ball, & therefore on the whole the chance is $\frac{3}{4}$. And this, as I need not tell you, is the case which I mentioned to [Arthur] Cayley. The moral so to speak which I deduced from it, is that unless the hypothesis on which we proceed is distinctly '*precisé*' one result is as plausible & in reality as valid as the other.

Wilbraham's doctrine as to the a priori probabilities amounts in effect to assuming that the urn [*damaged*] filled by pitch & top – that is that [*illegible*] white [*illegible*] in when head comes up & a black one when it does not, or vice versa: a quite legitimate hypothesis, but by no means necessarily true.

The recognition of the subjective or conventional element in the theory of probabilities a posteriori is I think of the highest importance in the appreciation of the results to which it leads. I have said something about it in what I published on

probabilities in our transactions,[207] but much less than the nature of the subject required.

I do not suppose this letter will [*word scribbled through*] interest you much, but you may send any part or the whole of it to Wilbraham, if you think fit. I have written it to inform your conscience on the subject, so as to save you the trouble of thinking it out for yourself. *E charin e suggnomen* [either kindness or forbearance].

R.L. Ellis

[TCL, Add.Ms.c.67/11
Robert Leslie Ellis to William Walton
26 November 1849
Nice, France]

Hotel des Etrangers a Nice
26 November 1849

My dear Walton,

I owe you & madame many thanks for the letters I received at Orange, which gave me great satisfaction. When one has been wandering for some time without hearing from anybody, it is very pleasant to get letters, especially letters like yours. Of my movements you will expect me to give you some account. I left London the 1st crossed the next step & slept at Abbeville; then to Paris then after a few days to Lyon by Dijon & Chalon, where I took the steamer on the Loire. From Lyon I went still by water to Avignon where I halted for some days – making excursions there to Orange & Nimes. Then having somewhat changed my plan, & beginning to think of going to Naples, I went to Arles, then to Aix the old capital of Provence, then to a little place called Vidauban; thence to Frejus & thence here. I think of staying here some time & perhaps may get no farther. C'est un triste plaisir que de voyager seul [It's a sad pleasure to travel alone] –sometimes pleasant to feel that one can go here or there with no one's wish to influence your own, but more often half saddening to reflect that it is only the liberty of isolation. Then one is so helpless if anything goes wrong: when I arrived here I was suffering so sharp an attack of fever that I could hardly stand when I got out of the carriage. I went to bed as soon as I could, in great doubt as to when I should be able to get up – it seemed like the beginning of a serious illness. However by staying in bed, & drinking a good deal of water, I managed to get rid of the fever much sooner than I had reason to expect, but am still rather shaky. Then the sort of people one meets with: well said Cacciaguida when he foretold to Dante the unhappiness of exile. 'E quel che più te gravera le spalle' Sarà la compagnia malvagia & scempia,' Con la qual tu cadrai in questa valle' ['Yet what will weigh upon your shoulders worst / is all the foul, ill-minded company / that

[207] Reference is to Ellis's 'On the foundations of the theory of probabilities', read in 1842 and published in 1844.

you, in that dark vale, will have to keep].[208] Of course there is a good deal to be set on the other side: the pleasure of seeing new places, libraries & works of art, fresh aspects of nature, & different races of men – & feeling that one learns something from all this. It is worth going some way to pass under the shade of olive trees & to see whole hill sides covered with the brilliant green of the stone pine. When I got to Cannes, ill as I was, the sight of arranges ripening the open air was enough to give me the pleasant feeling that I had reached the sweet south – though of weather pleasantly warm I have had hardly any. Here at Nice there is a perfect colony of English people: English service in a tolerably well built chapel; English doctors & libraries; half the well dressed people you meet are English.[209] But the aspect of outward things is exceedingly unlike England: fancy a girl selling green lemons from door to door, as you see them sell apples & carrots. But the pleasantest impression I had of the south was at Aix, where at the table d'hote a pretty young girl came offering branches of roses & orange flowers; & even Aix is less a place for flowers than this. There is an excellent library[210] there, open to all the world as are all libraries in France. I mean of course public libraries & the town is the new part at least clean & handsome; but I had a kind of onward impulse which brought me here. In the journey which was a very tiresome one though to make it less so, I posted the latter half of it, I caught my feverish attack, & it came into head that it might be a sort of destiny which was taking me to Nice to stop there. When one gets over an illness which looks as if possibly it might come to something, one is apt to reflect that it will all have to be done over again some other time, *e eos, e kai dailes, e kai meson emar* [either at dawn, or in the afternoon, or at midday].

I hope your canvas will be successful & wish I could be of any use. Joe[211] is, notwithstanding his absurd angularities & poetry, a good & jealous friend, & one may talk in any way to him without being considered a reprobate, though not so certainly without thinking him one – at least in a modified sense. Cambridge is certainly a bad place for speaking one's mind; at least the whole of it. It belongs I suppose to the conception of a place of education that it should encourage certain modes & phases of thought rather than others & this influence is probably on the whole not unwholesome. I have had my own way there, partly by making people feel that I meant no harm, & chiefly by talking commonplaces to commonplace people. 'He that maketh himself a clear glass for every man to look into, maketh himself withal an ass for every man to ride upon'.[212] As a less authority says, il faut

[208] Dante, *Divine Comedy*, *Par*. 17.52–66.

[209] From the early 1800's on English visitors arrived in growing numbers at Nice (and other places along the coast), following the advice of Tobias George Smollett (1721–1771) concerning fresh sea air, and other feats, in his *Travels Through France and Italy* (Dublin, 1766) and *A Sentimental Journey Through France and Italy* (1768). The influx led to the creation of several English- speaking businesses in Nice as well as a Church and a library.

[210] Reference is probably to the English American Library Nice, founded in the 1820s.

[211] Not identified.

[212] Source not identified.

savoir se faire à la toute puissance des sots[213] [one has to get used to the almighty power of fools]; & it is singular how men interpretantur in pejus [interpret as worse] that which they do not rightly understand. I think sometimes you sin a little in the way of puzzling people: added to which one should cultivate the art of being commonplace in habits as well as in talk. My dear Walton I feel that all this is in one sense impertinent but I am sure you would forgive me if you knew how very much I have your interest at heart, & so I will go on a little farther. I would have you make your relations with your pupils as much like Hopkins's for instance as possible: that is I would not call examinations fights, & I would give Lumprey a bene discessit.[214] Then one always found Hopkins en grande toilette &c. All those things tell, & tell faster than one readily understands. Basta as I shall say when I go into Italy if I do, & if I am not there now which on the whole is probably the most correct view of the matter – though everybody speaks French here. I am thinking of taking lessons of Italian while I stay here; that is for speaking for I know Italian to read it tolerably well & have read a good deal: still I should be puzzled to order dinner or to settle with a postilion,[215] or vetturino.[216] Diligence travelling is mere misery, & yet when one is alone any other way seems an unwise expense. So in this dilemma I dare say I shall remain here. I half regret the Pyrenees if it were only to be able to talk to Mrs Walton about them when I come back, but this is probably a softer climate, in [illegible] be as oranges ripen here. Pray write to me here as the letter will follow me if I am gone. I have heaps of other things to say, but they must wait until the next time. Do let me hear from you soon, & if there could be a postscript as to your last letter, it would be very gratefully received. With kindest regards to all your party believe me ever yours R.L. Ellis

Nov 26

[TCL, Add.Ms.c.67/8
Robert Leslie Ellis to William Walton
Undated, but from 1849/50]

From Robert Leslie Ellis

My dear Walton,

I received yesterday your & Mrs Walton's most kind letters – which I waited to get before writing. We arrived here Friday, & I hope to be able to leave it tomorrow but am not sure. I fear your notion of my being better is without foundation. Travis[217] would have sent me away long ago if the season had then been as favourable as now – & in fact there was only two or three weeks of my stay at Nice

[213] Sébastien-Roch-Nicolas Chamfort, "Petits dialogues philosophiques," in P.R. Auguis, ed. *Oeuvres complètes de Chamfort*. (Paris, 1824), 377.

[214] 'Lumprey' is probably meant to represent an unintelligent student. A 'bene discessit' was a formal permission for a student to leave a college.

[215] A person mounted on the left-hand side horse of a pair of horses drawing a coach.

[216] Coachman.

[217] One of Ellis's doctors.

during which the journey might not have been attempted. That was the time during which I thought or rather hoped that I was going the way of all the earth; I am somehow better in myself as people say than then but in all respects more uncomfortable than at an earlier time, namely when I left San Remo. In truth I have never been more helpless than during the last few days & seem to see the time coming when I shall be unable to do any thing for myself. I have very nearly reached that point already, in the state of nature I suppose I should be put out of pain by being knocked on the head – as it is I have all sort of attendance, paid & unpaid, for I got an excellent travelling servant at Nice who is exceedingly kind & attentive.

Mrs Walton is good enough to ask how I look after my illness. I am much bent forward & the head a good deal down, on the chest, & immovable sideways or nearly so, I drag one foot in walking partly from the knee & partly from general weakness. My hair is somewhat thin & eyes very hollow & half inflamed. Altogether I am excessively repulsive to myself, as I have long been more or less. It is curious when at the end of the days [sic] journey I am extracted from the carriage to see how the people look at me – not that I see half of them, though I pull my hat off as a mark of respect to the master or mistress of the house of whom I see at first only the skirts or gaiters &c.

One great bore is to have to lie almost all day on the sopha [sic]; the greatest of all being the difficulty of rising. Look in Homer for the last line but one of Hector's speech to Andromache & you will know what I think of very often.[218]

This city of the popes, or this part of it is detestably noisy, & the hotel overpraised though it is not bad as inns go. I have got a life of Petrarch to amuse myself with & an essay on the antiquities of the department by a man who begins by giving a list of his other [works] – one being a 'history of China before the flood of Ogyges',[219] which is at least a good title: It was in Avignon that Petrarch saw Laura – not that it matters much where.

What a terrible accident at Angers.[220] The same thing happened at Manchester when a battalion of the 60th was going over a bridge – most of them were over however in that case before the bridge broke – it was made a rule then to go over suspension bridges in loose step. One of my brothers[221] was present but had got over in time, being reserved for a more miserable ending.

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[218] '*Alla me tethneiota chute kata gaia kaluptoi prin ye ti*' ('But may I lie dead, and may the heaped-up earth cover me'): Iliad 6, 464–5: In other words, 'Over my dead body'. Also quoted in another letter to Walton (Add ms.c.67/87).

[219] No book with that title identified.

[220] The Angers Bridge, also known as the Basse-Chaîne Bridge – a wire (or suspension) bridge over the Maine River in Angers, France, built between 1836 and 1838 – collapsed on 16 April 1850 while a battalion of French soldiers was marching across it, killing some 200 of them. After the accident, many of the wire bridges in Paris were replaced by truss and arch structures. See Charles Bender, 'Historical sketch of the successive improvements of suspension bridges to the present time,' *Transactions of the American Society of Civil Engineers* 1 (1872): 27–43.

[221] Ellis's brother Henry William committed suicide in his barracks in March 1841.

Pray excuse a bad pen & worse paper. I will write again if I can, if not from Paris, at least when I reach England.

With kindest regards to Mrs Walton & many thanks.

Ever most truly yours

R.L. Ellis

[TCL, Add.Ms.c.67/12]
Robert Leslie Ellis to William Walton
2 January 1850
San Remo, Italy]

H. de la Palme
San Remo
January 2

My dear Walton,

Both when you & Mrs Walton were writing your kind & very welcome letters & when I received them I was at this place, a little town between Nice & Genova, & here I am likely for some time to remain. I left Nice for Rome the 13 Dec & was stopped here by a rheumatic fever. What I have suffered in body & spirits, I am not very willing to call to mind, still less to restate, least of all to you who have vexations of your own more than I could wish. So it is here I am, in almost a helpless state, scarcely able to sit up for two or three hours. When I shall be able to shave is a great question – my right arm being nearly useless though the wrist & fingers are free. Do you remember in the essay on death, not Bacon's though ascribed to him,[222] the phrase 'one thing have I deserved that I may not die among strangers, nor be stripped before I am cold'.[223] I cannot tell you how often I thought of it, during the height of my illness, & of the ill omen which marked my arrival here. I felt I was going to be ill & look you in the poultry yard I saw a sick fowl, & a turkey hen with the most deliberate cruelty, torturing it to death. But I must stop.

Whenever I can move I propose to return to Nice stay there until spring & then transport my shattered body to England. So much for the sweet south. The moral of it all, or one of the morals is that it is well if one can, in spite of a thousand anxieties & pains to make while one may a nest to take shelter &to die in. Mais j'ai manqué ma vie [But I have missed my life] in this as in other things; & the 'jam venit hiems componite nidas' ['winter is here, build nests'] is one of the many pieces of good counsel which I am afraid I must not now think of trying to follow.

[222] Bacon's essay 'On Death' (1612, enlarged 1625). The essay was included in the 1612 edition of the *Essayes*. Basil Montagu, the famous Bacon editor, for example, questioned whether the essay could be ascribed to Bacon.

[223] Source not identified. This phrase does not appear in 'On Death' or in any other of Bacon's (English) writings.

I shall be exceedingly glad to hear of your brother's[224] success – pray write to me if all goes well – you cannot write to any one who could sympathize more in any thing which interests you, whether pleasantly or the reverse.

Touching Nettle,[225] I rejoice to hear of her health & wish her puppy were lost like the last; with a little judicious management I dare say such an arrangement may be brought about.

I need not tell you Bacon has stood still lately. At Nice I worked at a preface for the N[ovum].O[rganum] tolerably well. There is a public library there with some curious books. The whole collection consists perhaps of 8000 volumes.

I cannot conclude without telling you how much delight your letters gave me: almost the only consolation I have had. Do write soon addressing P[oste] Rest[ante] Nice – when a letter will come to me here, if I am here still.

With kindest respects to Mrs Walton, & all good wishes to you & yours I am my dear Walton ever yours R.L. Ellis

Pray remember me most kindly to the Vicarage. I am sorry to hear of Mrs Webster's[226] state.

[TCL, Add.Ms.c.67/13
Robert Leslie Ellis to William Walton
22 January 1850]

22 Jan 1850

My dear Walton

Many thanks for your letter & Mrs Walton's. I am grieved to hear of all your troubles, & hope they will soon be at an end. One at least is fairly over, & the saddest all. Certainly to see any one die if one does not see it in one's childhood makes a sort of break in one's life: that last scene, apart from any special grief, remains in one's mind as a fatal remembrance of mortality – much more impressive than the Ash Wednesday catholic ceremony, when the priest puts some grains of dust on every one's forehead & says 'Memento quod pulvis es & in pulverem reverteris' ['remember that you are dust and will return to dust'] – though that too is not unimpressive. The worst is that with the solemn aware which the presence of death produces comes the mere dread of dying if not at the time, yet no other times when body or mind is unstrung, & one learns the force of what is said in the psalms 'the fear of death hath got hold upon me & a horrible dread hath overwhelmed me'.[227] Yet many things beside the circumstances you speak of make one thing death desirable though fearful, as disgrace, or disease, or even [*illegible*] infirmities as make men repulsive to their fellows.

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[224] No information found on Walton's brother.

[225] Walton's dog.

[226] Possibly the vicar's wife.

[227] 'The fear of death is fallen upon me […] and an horrible dread hath overwhelmed me', William Paley, 'Proper psalms for a sick person at sea', in *The Works of William Paley* (Edinburgh, 1828), 286–287, on p. 287.

To tell you something of myself: I am better but the complaint having fallen sharply on my knees have passed the last sixteen days with one unlucky exception which produced a relapse in bed, where I am likely to remain some time longer. I am almost absolutely helpless – to turn or sit up in bed is always a great & sometimes a painful effort. But the fever seems nearly gone some days quite which makes my doctor think it has taken an intermittent type & he is giving me quinine. I have not only had an Italian doctor but sent for an English one once from Nice. The Italians are fond of bleeding. This one bled me 4 times in as many days – to say nothing of hosts of leeches. I do not feel as if I can ever rightly get over the shake I have had – & am particularly afraid of mischief at the heart – a common result of these complaints. Sufficient for the day. It is sort of comfort to me that the person who would have been made unhappy by seeing me come back to England [as I] shall probably come back has long since been a rebus humanis exemptus [dead].[228]

The winter here has been more severe than usual. This is a particularly warm place – you see palm trees ripen their fruit. At Nice however they do not grow at all, except possibly in gardens – I did not see any there. Pray let me hear from you & Mrs Walton again soon (I hope she has quite recovered from the scalding – I have escaped so often from hot water that I was beginning to be skeptical as to its power of doing mischief.) Do not be afraid of writing sadly; nothing is more true than that levity is the only thing insupportable when one is not happy – a reflection some of the letters I have had lately had suggested though I had not put it into words. Say everything for me to all Chesterton.

Yrs ever R.L. Ellis

[TCL, Add.Ms.c.67/14
Robert Leslie Ellis to William Walton
4 February 1850
San Remo, Italy]

Feb 4 1850
San Remo

My dear Walton

I am right glad of your brother's success: it is the best news I have heard for a long time & comforts me not a little. Tell me more about him.

I am still here: the fever seems to have grown hectic; slight & persevering; my knee a very little better. I sit up an hour or so without dressing, & can do very little for myself, though leaning heavily on chairs & tables, I can walk a step or two. My heart has got out of order – makes me wretched sometimes. My Nice doctor thinks the Italian has overbled me, & that this may be the cause of the mischief at the heart – which he seems uneasy about. God help me if it is to be a permanent disease. I have been sick enough of my life before. The worst is, one is sick of it, & yet not content to leave it. I do not number by natales grate as Horace recommends

[228] Ellis may be referring to his father or to his mother – both dead.

disgracié [disgraced] as in many respects I have long been.[229] I think often of what you said in October – that we were all a good deal the worse for wear, but yet might as well go on together while we could.

It seems impossible that I can get well over this illness, even setting aside the heart question. However we shall see.

I wish very much to get to Nice. Here I am steeped in discomfort & solitude.

I saw in a Galignani[230] the tragedy, & wondered if they were akin to the one we know. It gives one a less good impression of him, that he should lead so careless a life, to say the least of it, having had so much reason for sad thinking. Listen to Martineau talking about him, & you will think Martineau quite rigid.[231]

I hope to hear from you soon in answer to my letter, but could not delay telling you how glad I am about your brother – your letter reached me this evening.

With kindest remembrances to all Chesterton.

Ever yrs R.L. Ellis

[TCL, Add.Ms.c.67/77
Robert Leslie Ellis to William Walton
17 February 1850
Nice, France]

Nice
Feb 17, 1850
Hotel de la Pension Anglaise

My dear Walton

I delayed a little answering your letter, wishing that the first I wrote from Nice should be to you. I got here yesterday in a carriage fitted up with mattress & pillows, & accomplished the journey in a little more than six hours which is surprisingly little without more fatigue than was to be expected. The jolting hurt my knee but I hope not materially.

I do not know how I should have done without a cousin of mine who reached S. Remo Monday, having left England as soon as he knew I was ill. He packed my portmanteau, got me into the carriage, paid the postboys & saved me always all the trouble of the journey. The comfort of having him here & of being here in a clean room with carpet & papering, with a clean quiet mannered waiter is inexpressible, & makes me feel decidedly better. The English doctor has made no examination yet of the heart. When I can get out I am to be carried up & down stairs to avoid exciting it.

Now I look back on it, I do not know how I lived through the last two months – the utter discomfort, & helplessness, & pain; the want of confidence in any one – for all the people of the house deceived me in a thousand ways, & tried to plunder me,

[229] 'Natales grate numeras?' ('Do you count your birthdays with gratitude?'): Horace, *Epistles* 2.2, 210.

[230] A long-established continental bookshop chain specializing in English books.

[231] The reference is probably to the English writer Harriet Martineau (1802–76).

being goodnatured too in their way, & the doctor I had no confidence in medically – the bad food unclean & unwholesome &c.

Today I got up before breakfast; the day before yesterday. I thought it a great matter to have been up five hours. But still I am full of aches & pains, & still my heart is functionally or organically far from right.

For some time I thought I shd have been sent to Nice consigned to the care of the English sexton[232] & found before I left S. Remo, that my doctor had so far the same opinion that he would have given me the viaticum if I had been a catholic.

Excuse much of myself.

I hope Mrs Walton's throat has by this time recovered – the weather here is bright but treacherous – & I believe one is just as well at Chesterton.

With kindest regards to her & the Vicarage

Ever yours

R.L. Ellis

[TCL, Add.Ms.c.67/15
Robert Leslie Ellis to William Walton
Good Friday 1850
Nice, France]

Hotel de la Pension Anglaise
Nice. Good Friday 1850

My dear Walton

Behave yourself better to me about letters than I to you, for I value yours & Mrs Walton's postscripts very much though I am not always sedulous in entitling myself to receive them.

But you know grievous weakness unfits one for everything & then there is also the wish to wait in hopes of being able to say something cheerful about oneself. But in present I should certainly wait too long as I have gone back the last week, & now am threatened with a feverish & bilious attack which has brought on a great deal of weakness & much pain. So that I have not been more helpless since I came here. The last sentence is not accurate, but it is not worth correcting.

I said to Travis today that it was a terrible illness. He answered quietly 'Yes' & so we left the subject. Some time since I thought I was going the way of all the earth;– now I see only a future nearly as burdensome as the last three or four months. 'God amend it when his will is'[233] – I am utterly tired of it all & as Milton says somewhere, nature within me seems, In all her functions weary of herself.[234] As I lie

[232] That is, to be buried.

[233] Sir John Mandeville, *The Voyages and Travels of Sir John Mandeville, Knight* (London, 1705), 13.

[234] 'My hopes all flat, nature within me seems, In all her functions, *weary* of herself', John Milton, 'Samson Agonistes,' in *Paradise Regained, and Other Poems* (London, 1823), 82–121, on p. 94 (lines 595–596).

awake at night or on the sopha passages out of my former life come into my mind & bring very strange feelings with them. It seems that it cannot be me to whom such & such things happened – & yet at other times I feel so much like my old self that it is not until I make some movement or try to rise that the realness of the change comes upon me. *Oimoi, ti d'oimoi* [woe, woe is me].[235] Certainly one of the views one may take of life is that it is almost from the first a decline, one prospect after another is taken away & the whole scene darkens until all is dark. I have thought so for a long time, but just now the change is too rapid to be borne cheerfully.

Cope[236] arrived yesterday. I wished I had been better just when he came. He has brought me some books & a pair of Labrador boots, the latter from Mrs Latrobe. They had been expected a long time. They are all fur & will I hope keep me warm when I am able to travel: better than with charcoal which I have had hitherto.

You ask about my fingers: there has been no rheumatism below the elbow but the right arm is still somewhat crippled with it at that joint. I suffer much from rheumatism about the head. The weather here of late very harsh: no rain since the middle of January until a few nights ago, everything very dusty & the early spring flowers nearly over – so my cousin reports who is out a great deal. The last day I was I saw a procession of the congregation of penitents, women in white men in red – rather pretty though one did not see any manifest signs of penitence about them. How would you & I feel in red gowns, singing in Latin along Trinity St?

I cannot write very much more though I should like to do so, & have des riens [nothing] enough to say. Pray write to me soon & believe me with many thanks & kind regards to Mrs Walton. Ever yrs R.L. Ellis

[Add.Ms.c.67/71
Robert Leslie Ellis to William Walton
6 September (probably from 1850)
Brighton]

Belgrave Place Brighton
Sep 6

My dear Walton

You are right in thinking the shampooing has been a disappointment. For the last five weeks I have been contented with ordinary day rubbing which has not done any

[235] Part of a line from Euripides' play *Bellerophon*, quoted by Diogenes Laertius (Fragment 300 Kannicht): 'Alas! But why Alas? We have suffered the lot of mortals'.

[236] Edward Meredith Cope (1818–1873, Senior Classic 1841), classical scholar, elected Fellow of Trinity College, Cambridge, in 1842. Mention of Cope's visit to Ellis is made in H.A.J. Munro, "Edward Meredith Cope," in *The Rhetoric of Aristotle*. Volume 1. Revised and Edited by John Edwin Sandy (Cambridge: Cambridge University Press, 1877), xiii-xx, on p. xx: 'Whenever a friend needed care and sympathy, none so prompt as he to offer them. When Robert Leslie Ellis, for whom he felt an unbounded admiration, was seized with fever at San Remo in 1849, off hurried Cope at once to render him all the assistance it was in his power to give'.

perceptible good, but is less trouble than the vapour bath &c[237]. I have been since Cope saw me rather better but am now worse again. These fluctuations are wearying: they keep alive hope. My physician here says he thinks I shall ultimately get better if my health will stand; however I do not much believe him. I am sorry to hear of your illness. Grote however told me of your having got into fresh air, which after a short illness however sharp is a great step towards getting well. Write & tell me how you are going on.

Do you know anything by Young, I believe the Belfast Young, about the tides?[238] Archibald Smith speaks highly of it, & I rather wish to know if it is published separately or in any periodical work. He & Thomson[239] are both at Helensburgh on the Clyde[240] – not together, but promiscuously as people say. I have been corresponding with them about Herschel's nonsense in the July number of the Edinburgh review touching the method of least squares.[241] I am beginning to think this famous man is only a better kind of Mrs Somerville[242] – better just by being a man – as I remember once in the old days Knox[243] recommending Lamartine[244] to you, you asking him if it were not like recommending Mrs Hemans.[245] He put out by the question said Lamartine excelled her by being a man & not a woman: he could not deny their being analogous. Do you remember this – late one Sunday night in November or December/34? Is it not horrible to look back & forwards & find no comfort either way? When I think of the wreck I am I wonder I do anything but cry. This day twelvemonths I had just returned to town from Malvern, everybody afraid of the cholera;[246] better for me to have died of it than have dragged on as I have done since. I had still some energy left & some hopes. It seems so strange after what I have felt in the old times & hoped to be able to accomplish to see all escape from me; as if it

[237] Shampooing, rubbing and baths of warm air, vapour, sulphur, chlorine, etc., were considered to aid medical treatments

[238] No 'Belfast Young' has been identified. Ellis's reference is most likely to Thomas Young (1773–1829), the polymath, born in Milverton, Somerset, who revived interest in tidal theory in Britain and who developed the theory of cotidal maps, further developed by William Whewell and others.

[239] William Thomson (1824–1907, 2W and winner of the first Smith's Prize 1845), mathematical physicist better known as Lord Kelvin. Professor of Natural Philosophy at the University of Glasgow (1846), for 53 years, and President of the Royal Society between 1890 and 1895.

[240] Helensburgh, a town northwest of Glasgow. Smith and Thomson, both of Scottish descent, were close friends. Whether the purpose of their visit was leisurely or scientific is unclear.

[241] John Herschel's proof of the law of least squares appeared in John F.W. Herschel, "Quetelet on probabilities," *Edinburgh Review* 92 (July 1850): 1–57. See Stigler's chapter in this volume for a discussion of Ellis's criticism of Herschel's proof.

[242] Mary Somerville [née Fairfax] (1780–1872), Scottish science writer, mathematics expositor and self-taught polymath. Perhaps best known for her *On the Connection of the Physical Sciences* (1834).

[243] See diary entry for 12 October 1839.

[244] Alphonse de Lamartine (1790–1869), French author, poet and statesman.

[245] Felicia Hemans (1793–1835), poet popular in her day but now often criticised for her sentimentality. Her most famous line is 'The boy stood on the burning deck'.

[246] A two-year outbreak of cholera began in England and Wales in 1848, claiming 52,000 lives.

were impossible that life could be so utter a cheat. Surely I shall go softly said Hezekiah[247] all the days of my life in the bitterness of my soul.[248] I cannot got at all except metaphorically, but there is bitterness enough in my heart. Of course *thneta peponthamen* [We have suffered the lot of mortals][249] – a reflexion which always consoles one's friends & consoles oneself in their misfortunes.

I have no plan for leaving this place, so write to me here; it is useless to say how glad I should be to see you – if you take a run anywhere after your illness let it be here.

Say everything for me to Mrs Walton & the Vicarage.

Yours ever R.L. Ellis

[TCL, Add.Ms.c.67/80
Robert Leslie Ellis to William Walton
13 December (probably from 1850/1)
Bath]

Brock St Bath
Dec 13

My dear Walton

You are so goodnatured about my commissions that I am ashamed of myself. But to say the truth the portfolio with a lock which arrived safely today along with the chair is no more the box I was thinking of than my old silver friend is my father's chronometer. However it will answer the purpose of giving me some refuge from female or rather feminine curiosity, though it would do better if it were not already half full of odds & ends, & if it were of presentable appearance. So that the dispatch box which I would have you to know is a red leather box with a bramah[250] lock may slumber on at Metcalfe's. I am glad the watch is safe: if you look at it's [sic] back you will see my cipher in the centre; engraved once while I was away in college & not shown me until long afterwards. Eheu [Alas] it is just ten years since I returned to Bath after leaving Trinity – the last time of my being here for more than a few days, & as I go moving about the country & through the streets, ten thousand recollections & contrasts occur to me. On the whole it consoles one to think how many sources of pain have in that interval been finally closed up: how many hearth burnings how much anxiety death has quieted. Jovi liberatori libemus[251] said, as you remember, Thrasea just before his death: I should be apt to say 'morti liberatori'

[247] Hezekiah, son of Ahaz, 13th successor of David as king of Judah.

[248] 'I shall go softly all my years in the bitterness of my soul': Isaiah, 38 ('Hezekiah's song of thanksgiving').

[249] From the Euripidean fragment quoted in Ellis's letter to Walton of Good Friday 1850.

[250] In 1784, Joseph Bramah designed a round lock mechanism operated by a tubular key; it was patented a few years later.

[251] Tacitus, *Annals* 16.35. The dying words of Thrasea, accused of treason by Nero, said as he committed suicide.

['death the liberator'] solitude is not too great a price to pay for tranquility, it being surely better to have one's heart empty than aching. The worst is one cannot help condemning oneself: 'if I had done this or that'. On the other hand I seem to have paid the penalty for all my mistakes.

If you are going to have a new edition of the Solid Geometry & Mechanical Problems[252] there is at least one suggestion I could make about each. Gregory seemed to regret not having known a way I showed him of finding the linear generations of the hyperboloid of one sheet (not a way of my own); & in the chapter on impact the question of the rolling sphere really does not deserve the space you give it: it may be solved as I showed Thomson & Mathison[253] some years ago without any equations at all. There was too a very pretty impact question[254] when Stokes[255] was moderator in 1847. I have a solution of it somewhere.

Ever yours

R.L.E.

Remember me to yr circle

[TCL, Add.Ms.c.67/87
Robert Leslie Ellis to William Walton
Undated, but probably from the early-1850s]

My dear Walton

Not knowing ether when the vacation begins or at what time you propose to be absent from Cambridge, I write now to thank you for the kindness of your proposal visit, & to say that I shall be delighted to have everything ready for your reception whenever you come, if you will let me know beforehand – Munro[256] will tell you of the magnificent way I entertained him.

[252] Walton concluded *A Treatise on the Application of Analysis to Solid Geometry*, commenced by Duncan F. Gregory. The first edition appeared in 1845, the second in 1852. The 'Mechanical Problems' mentioned here refers to Walton's *A Collection of Problems in Illustration of the Principles of Theoretical Mechanics* of which the first edition appeared in 1842 and a second edition in 1855.

[253] William Collings Mathison (Trinity 1834, SW 1839) was Moderator in the 1846 Mathematical Tripos, together with Stokes, and Examiner in 1847.

[254] See George Gabriel Stokes, "Appendix (Mathematical Tripos and Smith's Prize questions)," in Joseph Larmor, ed. *Mathematical and Physical Papers*. Volume V (Cambridge: Cambridge University Press, 1905), 296–368, problem either on p. 305 or p. 307.

[255] George Gabriel Stokes (1819–1903, SW 1841 and First Smith's Prizeman), elected Fellow of Pembroke College, Cambridge, in 1841, and appointed to the Lucasian Chair of Mathematics at Cambridge in 1849.

[256] H.A.J. Munro (1819–1885, Second in First Class of the Classical Tripos 1842), elected Fellow of Trinity College, Cambridge, in 1843 and appointed to the newly-founded Chair of Latin at Cambridge in 1869.

Though I am not much in the habit of buying books yet I bought the Makamat,[257] chiefly because in the last summer of my live life, Preston[258] & I used to lounge about the bowling green, he quoting his translation and I listening & applauding. I liked it better in MS than now it is printed. So I will not ask you to bring me it, but if Klaproth's Tableau Historiques de l'Asie[259] is in the library, I should be very glad to see it. A very few days looking at it would be enough so it would not interfere with your getting books out of the library. Grote was to bring me months ago at Brighton two books; he is now talking of coming to Bath – but this plan is a distant one. I will ask him to trouble you with [*illegible*] certain MSS. Also if you will not think me unreasonable, I should be very glad to have the chronometer: the best way of bringing it would be to wear it; & then the box can go any where.

I am just getting over the third feverish attack I have had in the last two months – they are not much in themselves but tend to weaken me. To say the truth I doubt if I can go on much longer keeping as near the habits of health as I have been doing. I mean dressing regularly, & going out of my bed room. Yet giving up things so much connected with the propriety of life would be almost a greater grief than any thing I have yet had to give up – to be fed & dressed – to be dirty & neglected. Bah. *Alla me tethneiwta chute kata gaia kaluptoi prin ge ti*[260]. My meaning about the relation of soul of body or rather of man to his corporeal outside; was something different from what you apprehend & that I [thought?]– as it seems to me – mental causes act on the health sometimes manifestly at others only so as to produce a dimly felt drooping & flagging, & that griefs thus perpetuate themselves, because the bodily elasticity which carries men on & wittingly or unwittingly consoles them for everything is impaired. So that the permanent effect of sorrow or anxiety is not measured by its present intensity, but by the degree in which it has power permanently to derange the bodily functions. People say 'the sword wears out the scabbard'[261] which is true – but it is also true that the scabbard saves the sword the multiplicity of obscure genial sensations which the body during health continually is the cause of is really the main part of the consolation which is commonly & stupidly ascribed to time – as if time were a cause of anything. But then all this varies with better or worse health, & no question health is more or less worsened by grief.

Certainly looking back is dreary – all the right feelings that were choked – all the wrong ones indulged – & now all comparatively a blank – as if, which is not an elegant illustration, one's destiny had been playing at thimblerig with you & you had now found out there was nothing under any of the thimbles.

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[257] *Makamat: Or, Rhetorical Anecdotes of Al Hariri of Basra*. Translated from the Arabic, with Annotations by Thomas Preston (London, 1850).

[258] Theodore Preston, admitted to Trinity College 1836; B.A. 1841 (25W); M.A. 1844; Fellow of Trinity 1842–82; Lord Almoner's Professor of Arabic (Cambridge) 1855–71.

[259] Julius Heinrich Klaproth, *Tableaux historiques de l'Asie* (Paris, 1826).

[260] 'But may I lie dead, and may the heaped-up earth cover me': *Iliad* 6, 464–5: In other words, 'Over my dead body'. Hector's last words to Andromache.

[261] This phrase appears in a letter from Lord Byron to Thomas Moore, dated 28 February 1817, explaining the genesis of the poem 'So, we'll go no more a rovin'.

Touching Hume[262] – I say with Johnson 'for there is here much of what is called poetry'[263] – & further that as it seems to me there is more of the reality than in our copies of verses. However that is not saying very much. Every yrs R.L. Ellis

Remember me to everybody with you

[TCL, Add.Ms.c.23
Robert Leslie Ellis to William Walton
Undated, but from the late-1850s
Trumpington]

My dear Walton

I have been very feverish all the week and Paget[264] has noticed a dimness in the eye though the sight does not seem worse than a week ago. With some straining I was able to read your kind letter. I was never much affected by geology in the way you mention: partly because I was only a child when it interested me most, partly because the feeling of one's own nothingness has been so familiar to me that all the sands & shells in the world would hardly do more than an hour's walk through crowded streets. But I know that many people are affected by the contemplation of countless eyes & of the infinite number of forms of life which have now past away. Did I ever tell you that Gregory said he should have known a Cycloid by only looking at it? I remember long after saying to Cayley[265] I should not have known it from an ellipse. He duly agreed with and added 'I do not even know which would be outside the other.' I never considered the matter until three or four days ago and was struck to see how very nearly equal the two curves are. The area of the half ellipse exceeds that of the other by a less ratio than that of 22 to 23. Gregory's perceptions always seemed fine and possibly he inherited from Reed [sic][266] the habit of attaching importance to their evidence, for I remember one or two things of the same kind, but I believe Cayley was nearer the truth in this case. With our kind regards to you & Mrs Walton.

Ever yrs

R.L. Ellis

Anstey Hall
Monday

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[262] See the diary entry for 31 October 1839.

[263] Samuel Johnson to William Tasker, discussing Tasker's *Ode to the Warlike Genius of Britain* (1778). See James Boswell, ed. *The Life of Samuel Johnson. Volume 3* (London, 1816), 405.

[264] Ellis's doctor.

[265] Arthur Cayley (1821–1895, SW 1842 and winner of the first Smith's Prize), elected Fellow of Trinity College, Cambridge, in 1842, was the Sadleirian Professor of Pure Mathematics at Cambridge from 1863 until his death.

[266] Thomas Reid (1710–1796), Scottish philosopher and founded of the 'Common Sense School', emphasizing man's innate ability to perceive ideas. Gregory's views on mathematics are linked to this school in George Elder Davie, *The Democratic Intellect: Scotland and Her Universities in the Nineteenth Century* (Edinburgh: Edinburgh University Press, 2003 [1961]) and Lukas M. Verburgt, "Duncan F. Gregory and Robert Leslie Ellis: second-generation reformers of British mathematics," *Intellectual History Review* 28:3 (2018): 369–397.

[TCL, Add.Ms.c.67/28
Robert Leslie Ellis to William Walton
24 September 1857
Trumpington]

My dear Walton

I was grieved to send you away yesterday especially as my future is so uncertain.

Although for six weeks my diet has been much improved in quality & perhaps in quantity yet the tendency to fainting has almost uniformly increased.

For the last fortnight scarcely a day has been free from it but yesterday was the worst of all.

If I faint I cannot but think that my heart will not recover itself and even setting this aside the tendency to faint is I suppose good evidence the drain on the constitution, which you know of, is beginning to tell.

So let it be but that sudden tendency to syncope is with the conviction I have with regard to its issue enough to try better courage than eight years of suffering have left me.

If you never come into this room again, or even if you do, you may like to be told again what I have told you before, that your kindness has been in all my troubles, a real comfort, of these troubles you know many. There are others which I shall probably carry the secret of out of the world with me – griefs of conscience and so forth.

De Morgan has given up the point on which we differed. So that what I told you, as to the amount of small shot which can be put into a given span, you may take as settled. If I can I will enclose his letter. I do not want it, and send it chiefly because it shows what a good fellow he is. I am sure he wd be glad to see you.

With kindest remembrance to Mrs Walton

Ever yours

R.L. Ellis

If you see De Morgan, I am not sure he wd like to hear of our bushel controversy.[267]

24 Sept 1857
Anstey H.

[267] The 'bushel controversy' probably relates to the discussion on the practicability of adopting a simple and uniform system of weights and measures in Britain, where De Morgan advocated the adoption of the metric system

[TCL, Add.Ms.c.67/30
Robert Leslie Ellis to William Walton
18 November (1857/8?)]

Nov 28th

My dear Walton

I write to ask you not to come to-morrow. I do it with the more regret as I cannot but think it doubtful whether I shall ever see you again. The end must come at last and now seems very near. There is no use in despising symptoms and you need not be told to remember me if we do not meet again. May God have you in His Holy keeping, now, and ever. I may be mistaken in thinking my end so very near but I feel completely worn out.

Ever yours

R.L.E.

[TCL, Add.Ms.c.67/35
Robert Leslie Ellis to William Walton
29 November (1857/58?)]

Nov 29th

My dear Walton

I wish to tell you that on Thursday Paget auscultated and reported there was a great change in the state of the heart the rheumatism having now reached it. This is the secret of the intolerable pulse which has made the last two months the most miserable of my suffering life. He said the danger is not great not immediate. Since then, there has been an acute fit of rheumatism and I have eaten hardly anything. This world must soon pass away. I did not expect to get through yesterday but he seemed to think less of it than I did. Although what Paget told me is no more than what I have often thought myself, yet it shocked me both because it took away the chance of lasting and because it greatly lessened the hope of even temporary ease.

Ever yours

RLE

[TCL, Add.Ms.c.67/39
Robert Leslie Ellis to William Walton
24 December 1858
Trumpington]

Anstey Hall
December 24th 1858

My dear Walton,

I asked you not to come to-day and I was right but it made me very sad. I saw Lady Affleck for the first time since Monday week. Last Monday was the best day I have had. I am now entering again I fear on a paroxysm [outbreak] of inflammatory

rheumatism of the heart though as yet the attack may perhaps be averted. I cannot conceive how I survived the struggle I went through last week. I did not mean to say so much of myself, but only to send you good wishes. It will be ten years to-morrow since I dined anywhere on Christmas day. Poor Penelope and I were then together and dined with Mr. Trench[268] father of the dean of Westminster[269] at a pretty place he has near Southampton one of the three houses which in the course of my life I have coveted.[270] Another was at Tunbridge Wells and the third as you know, the one I was carried into nearly seven years ago and out of which I shall be shortly carried.

When ten or eleven years ago I fancied I should like to live here I did not know what was coming. 'Is not this man Coniah a despised and broken vessel?';[271] words which with their content have rung in my ears ever since I first learnt before I left Cambridge to apply them to myself. With kindest regards to Mrs Walton.

Ever yours

R.L.E.

[TCL, Add.Ms.c.67/45
Robert Leslie Ellis to William Walton
22 February 1859
Trumpington]

Anstey Hall
Feb 22, 1859

My dear Walton

It went to my heart to ask you not to come, especially as I shall probably have, if I live to make a similar request in a day or two. I have not seen Lady Affleck since Saturday. Let me suggest another little experiment. It seems to have been tried by Lord Bacon.[272] It is to sow the seeds of oranges and lemons after the chance of frosts is past. They come up according to him sufficiently to supply a good salad without any artificial heat which in his time was hardly known. A more ambitious attempt would be to sow date stones but I doubt whether they would even germinate without help though perhaps a melon-bed would be enough. As the cabbage of the data-palm is good it is probable that the early leaves would be so too. I would have tried these things in past years but when one cannot do them oneself, it is difficult to overcome the vis inertiae of servants and it is nearly six years since I have looked

[268] Richard Trench (1774–1860), barrister-at-law.

[269] Richard Trench's son Richard Chenevix Trench (1807–1886), Trinity, B.A. 1829, became Dean of Westminster Abbey in 1856.

[270] Name of house unknown.

[271] *Jeremiah* 22:28: 'Is this man Coniah [Jeconiah or Jehoiaching] a despised and broken vessel?'. (The King James Study Bible has: 'Is this man Coniah a despised broken idol? Is he a vessel wherein is no pleasure?').

[272] *Sylva Sylvarum*, 'Experiments in consort touching burials or infusions of divers bodies in earth' (no. 379).

forward to six weeks life. The curse of Moses 'Thy life shall hang in doubt before thee and thou shall fear day and night and have none assurance of thy life'[273] has been fulfilled here if ever anywhere.

Affectionately yours

R.L.E.

Kindest regards to Mrs Walton.

[TCL, Add.Ms.c.67/47
Robert Leslie Ellis to William Walton
31 March 1859
Trumpington]

Anstey Hall
March 31st 1859

My dear Walton

I shall not be able to see you to-morrow. To my feelings the heart is getting worse rapidly, and the lungs are now involved in the mischief. I am under no false hope but will ask you not to write so as to lead Paget to speak precisely on the subject. Answer a simple question. How many tangents can be drawn to a curve of the n^{th} order through a given point. At the first blush the answer seems n (n–1) but may it not be shown that a certain number of the tangents must in all cases be imaginary. I have in my head, but only half-framed what would I believe amount to a geometrical proof of Abel's theorem[274] but I do not expect ever to finish it. I expect nothing indeed but in a very little while a short struggle and then darkness. You remember my dear Walton, the one possible answer to Shelley's question,[275] God's mercy, He will do what is right, whatever that may be.

Ever yours

R.L.E.

[273] *Deuteronomy* 28:63.

[274] Mathematical theorem(s) named after the Norwegian mathematician Niels Henrik Abel (1802–1829). What should be understood by the term 'Abel's theorem' is contested. Steven L. Kleiman, 'What is Abel's theorem anyway?,' in O.A. Laudal and R. Piene, eds. *The Legacy of Niels Henrik Abel* (Berlin & Heidelberg: Springer, 2004), 395–440, discusses the history and meaning of four theorems that have been accepted as Abel's theorem.

[275] Possibly Percy Bysshe Shelley's question in 'Queen Mab' (1813): 'God omnipotent, / Is there no mercy? must our punishment / Be endless?'.

'MRS WALTON' (?-?), wife of William Walton.

[TCL, Add.Ms.c.67/90
Robert Leslie Ellis to Mrs Walton
(?) 1851
Tunbridge Wells]

Calverley Hotel No 7
Tunbridge Wells 1851

My dear Mrs Walton,

It is very long since I have had the pleasure of hearing from you: my own fault perhaps, & yet I am sure I have left no letter of you unanswered, little inclined as I ever am now to writing.

I heard from Trumpington that you had been at the [Sanatorium?] & that Walton was still using crutches. I hope he has long laid them aside, but he was lucky in being able to use them when he wanted them. I have two pair of different constructions in the room but am too helpless even to try to use them, & have given up any other kind of motion than wheeling in my chair & shifting from it to other seats. Crutches as the Vicar of Trumpington[276] would tell you, & I dare say his colleague of Chesterton[277] will confirm it, are crosses or rather cruxes – so called from their form. So that I may not without meaning be said to have taken up my crutch. To confirm the etymology it may be noticed that the crutched friars were friars who worse a cross on their vestments.

You have heard of my taking Anstey Hall.[278] But I am very doubtful of being able to get there: the last fortnight having been the most suffering I think I have gone through since I left S. Remo, or since the early part of my second stay at Nice. No only so – but the most threatening for I cannot disguise from myself how near I am to another outbreak of rheumatic fever: the nights especially are terrible with spasmodic pain in the chest & back & with feverishness. The character of the pain is so much changed that there must be a corresponding change in the inward condition.

I have been six weeks & more in this hotel: kindly people keep it, & have done everything to make me comfortable. But, to quote Cowper with a slight change, 'How ill the chairs which offer rest. And bones that cannot rest, agree!'.[279]

Well adieu. I wish I could say more definitely au revoir. At any rate, let me hear how all that interests you goes on.

With best regards to Walton. Your faithful sevt [servant]
R.L. Ellis

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[276] John Grote was the vicar of Trumpington from 1846 until his death in 1866.

[277] Edward Arthur Smedley was the Vicar of Chesterton from 1836 until 1873.

[278] Anstey Hall, Trumpington, two miles from Cambridge. This is the house where Ellis would spend his last years, from 1853 to 1859.

[279] 'How ill the scene that offers rest, And heart that cannot rest, agree!': 'The Shrubbery' by William Cowper, in *Poems, by William Cowper*. Volume 1. Sixth Edition (London: 1794), 344.

Correspondence relating to Ellis's death

HARVEY GOODWIN (1818–1891), mathematician and Anglican bishop, educated at Gonville and Caius College, Cambridge, which he entered in 1836, graduating Second Wrangler and Second Smith's Prizeman in 1840, just behind Ellis of whom he would write a highly appreciative 'Biographical memoir' for Walton's *The Mathematical and Other Writings of Robert Leslie Ellis* (1863). Goodwin first met Ellis while the two were pupils of the private tutor William Hopkins. They became friends after having worked together as Moderator and Examiner in the Mathematical Tripos of 1844 and 1845.

[TCL, Add.Ms.a.68/31
Harvey Goodwin to William Whewell
16/7 May 1859]

Deanery Ely
1[6/7?] May 1859

My dear Master of Trinity,

I thank you very much for your note concerning dear Leslie Ellis's funeral.[280] It will be a melancholy satisfaction to be present, and to be permitted to pay the last tribute of respect to the most remarkable man with whom it has been my lot to be on terms of friendship & intimacy. I will take care to be at Trumpington in good time.

Believe me

Yours sincerely

H. Goodwin

LADY EVERINE FRANCES (née ELLIS) (1807–1865). Born in Bath, the eldest of the six children of Francis and Mary Ellis. Known in the family as 'Fanny'. In 1834 she married Sir Gilbert Affleck; he died in 1854, and in 1858 she married William Whewell, Master of Trinity College, Cambridge. After her brother Robert Leslie Ellis's death in 1859, she censored and annotated his diaries.

[TCL, Add.Ms.a.68/149
William Hopkins to Lady Affleck
10 April 1861]

22 Grand Parade
Brighton, April 10, 1861

My dear Lady Affleck,

I have been for some time aware that many of my young friends in Cambridge and elsewhere have most kindly been interesting themselves about a testimonial[281]

[280] Leslie, a family name, was in effect part of Ellis's surname.

[281] A testimonial fund for Hopkins was set up in 1860 to mark his retirement from tutoring at the age of sixty-seven. See A.D.D. Craik, *Mr Hopkins' Men: Cambridge Reform and British Mathematics in the 19th Century* (London: Springer, 2008), 105.

to be presented to me as a mark of their esteem. My communications with them on the subject have hitherto been of the most general kind, and entirely restricted to suggestions respecting the form of the testimonial, but I have just received a note from Mr Ferrers[282] in which he tells me that, with a most liberal subscription, you have requested that the words 'in memoriam' may be attached to your name in the subscription list, under the conviction that I shall only esteem the subscription the more highly as being in any way associated with the recollection of your excellent brother. There is much, as you may suppose, which is deeply gratifying to me in the proposed testimonial, but I can most sincerely assure you that no circumstance connected with it can be more grateful to me than your own subscription with the request which accompanies it. There is perhaps no one of my former pupils (and nearly all have become my friends) whom I prized so highly in all respects, as your brother, and while I would acknowledge your very liberal subscription, I would also express how gratified I feel by the touching manner in which you have associated it with his memory.

I am happy to say that I am better as respects my lameness though still under constant surgical treatment. Perhaps I may be allowed to give a not inappropriate proof of the improvement of my pedestrian powers. A few years before your poor brother's death, but after he had resigned all hopes of ever walking again, he gave me his walking cane, which had long been known to some of his Cambridge friends as his constant out-of-doors companion. It has ever since been mine also, till the period of my accident since which I have been obliged to have recourse to stronger aids to my locomotive powers. Crutches however have been superseded by a strong [batch?] and, in its turn the batch is beginning to give way to my invaluable cane, which I trust will soon resume its position of y constant walking companion for the rest of my days.

Pray accept our united expressions of regard, & believe me, my dear Lady Affleck, yours very sincerely

W. Hopkins

[TCL, Add.Ms.a.68/160
William Walton to Lady Affleck
8 August 1863
Chesterton, Cambridge]

Augustus 8, 1863
The Vicarage Chesterton, Cambridge

Dear Lady Affleck

The Memoir[283] is not yet sent to Press. I thought it better not to send it until I have quite made up my mind as to the propriety of printing the letter to Mr. Power on the

[282] Norman Macleod Ferrers (1829–1903), B.A. 1851 (SW and First Smith's Prizeman), mathematical lecturer and later Master of Gonville and Caius College, Cambridge.

[283] Goodwin, "Biographical memoir."

Chinese Dictionary.[284] The Dean[285] has suggested a slight change to the allusion to this Letter in his memoir on the supposition that I shall print it. So that, whether it is printed or not, I shall have the right allusion to it in the Memoir. This delay however will postpone printing of the Memoir for some time. The engraving will be taken from the picture, if Professor Grote will kindly allow it. I hope to see him about it shortly. The copy of the verses I sent to the Dean: he has returned them to me, leaving the matter entirely in my hands, and giving me instructions how he would like me to modify the Memoir, if I decide upon inserting the verses. They are very affecting and full of thought, poetical & holy.

I am very glad to learn that your wanderings are prosperous, and that you are not, like our orator, going to Poland, a place infested by Cossacks who would not scruple to slaughter an Orator in the midst of a Latin speech.[286]

At the end of August we hope to go to the sea side for two or three weeks. I shall be glad of the rest, as I have been working nearly all the summer, either with my pupils, or reading mathematics in a wash-house which I share alternately with a company of laundresses. I am always glad when my turn comes: it is so very quiet.

My wife & Miss Smedley[287] desire to unite with me in hoping that you and the Master may return home all the better from your long tour.

Your faithful servant
William Walton

JAMES SPEDDING (1808–1881), English author and Cambridge Apostle, chiefly known as co-editor of *The Works of Francis Bacon* (1857–1859) and *The Letters and Life of Francis Bacon* (1861–1874). Educated at Trinity College, Cambridge; B.A. 1831 (Second Class Classical Tripos and JO in the Mathematical Tripos).

[284] Robert Leslie Ellis, "Some thoughts on the formation of a Chinese dictionary, and on the best mode of printing Chinese. In a letter to the Rev. J. Power, M.A., Fellow of Clare Hall, and University Librarian," in *The Mathematical and Other Writings of Robert Leslie Ellis*. William Walton, ed. (Cambridge: Deighton, Bell & Co., 1863), 400–414. Before being published in 1863, this letter was printed for private circulation, in 1854.

[285] Harvey Goodwin, author of the 'Biographical memoir' of Ellis, became Dean of Ely in 1858, and eventually Bishop of Carlisle.

[286] Reference is to Rev. W.G. Clark, Fellow and Tutor of Trinity College, and Public Orator of the University of Cambridge, who in 1864 published *Poland* in the Macmillan series, edited by Francis Galton, 'Vacation Tourists, and Notes of Travel in 1862–3'. In that same year, another Cambridge man, William Henry Hall, published *Polish Experiences During the Insurrection of 1863–4* (London & Cambridge: Macmillan and Co., 1864).

[287] Most likely the wife of Edward Arthur Smedley (1804–90), Vicar of Chesterton, Cambridge.

[TCL, Add.Ms.c.90/125
James Spedding to William Whewell
16 May 1859]

My dear Master

It is very kind of you to think of me; not if I may judge of other people's feelings by my own, the relatives will not be sorry to be spared the attendance of a stranger. From my youth up I have had much experience – more than my fare share – in family funerals, and I have always felt that they cannot be too private. I am very sure my absence will not be imputed to any want of sympathy. A deeper admiration and more tender regard I never felt for any man, nor ever more impatient grief for anything than for the ten years sufferings which are now at an end. There is hardly any body left now whose loss I can feel more strongly. But – how far I am singular in it I do not know – but so it has always been with me in such cases, that the stronger my personal feelings are the more indisposed I feel for public solemnizations.

Your letter would have been my first intelligence, if I had not happened to open [John] Grote's, which came at the same time, before it.

Yours very truly

J. Spedding

[TCL, Add.Ms.c.90]
James Spedding to Harvey Goodwin
7 December 1863]

7th Dec 1863
60 Lincolns Inn Fields

Dear Sir

I am very much obliged to you for the copy of your biographical memoir of Ellis,[288] which reached me two days ago and very glad to find that the writings he has left are sufficient to make a volume.[289] Whatever he wrote, dictated or said, had an original value; and any collection of his remains will help to give some notion of the wonderful powers that dwelt in him, to those who can follow and understand. I have been a good deal disappointed to find the nature the value and the amount of his labours upon Bacon[290] so imperfectly appreciated by the popular critics, and so much less preeminence given to his name than was due to it. I could not attempt to do justice to it in my own preface,[291] because what I said about him had to receive his own sanction, and anything which implied a recognition of his peculiar

[288] Goodwin, "Biographical memoir."

[289] William Walton, ed. *The Mathematical and Other Writings of Robert Leslie Ellis* (Cambridge: Deighton, Bell & Co.)

[290] Ellis was responsible for the editing of the Philosophical Works, which appeared as the first three volumes of *The Works of Francis Bacon*.

[291] James Spedding, "History and plan of this edition," *SEH* 1 (London: Longman and Co., 1857), iii-xxi.

qualifications for the work, was peremptorily struck out. Last year however I did make an attempt to get a passing acknowledgment of them introduced into a popular magazine and though the paper[292] which contained it was found inadmissible on other grounds, it may be interesting to you to know in what terms I had recorded my own impressions of his character, before I was aware of yours. Having made an occasion to describe the new edition of Bacon (with security of the anonymous plural) I proceeded to speak of Ellis' part in these words: 'The philosophical writings, which formed the largest and most important of these divisions and which, though often reprinted, could hardly be said to have edited at all, were to be undertaken by a gentleman who though young was well known to everybody at Cambridge as uniting a greater variety of qualifications for the task than perhaps ever before met in one man: an intellect of the very highest order,–subtle, exact, capacious, swift, discursive, sublime; well trained and perfectly tested by the severe discipline of the highest course of Cambridge scientific study; stimulated by an insatiable appetite for knowledge of all kinds, aided by an extraordinary sagacity in seeking, facility in apprehending, judgement in assimilating and digesting, tenacity in retaining and rapidity in recollecting; a learned acquaintance with the condition of science as well before Bacon's time as since, and with languages and literature ancient and modern; industry the most unwearied; fidelity the most scrupulous; a fine taste; a lively, playful and graceful fancy; and a standard of moral judgment the loftiest, the most delicate, the most uncompromising.'[293] This I intended to be not a vague panegyric, but a judicial estimate so far as I could attempt to form an estimate of a mind which seemed to me to belong to an order of intelligence different to my own, not in degree only, but in kind. The consciousness of which difference, combined with the extreme and almost morbid delicacy of his feelings, made it difficult for me to feel quite at ease with him, and to a certain degree prevented intimacy. I had an uneasy feeling that the one thing he could not understand was stupidity and therefore that there was always danger of his misunderstanding me.

With many thanks.

Yours truly

J. Spedding

60 L.I.F.
16 May / 59

[292] Spedding wrote two papers in which he criticized the publishing business for the way in which they had published *The Works of Francis Bacon* and the *Letters and Life of Francis Bacon*. The papers were turned down by the periodicals. In 1867, Spedding would publish, at his own expense, *Authors and Publishers*, containing the two papers. The paper referred to here is titled 'Publishers and book-buyers'.

[293] Spedding, "Publishers and book-buyers," in *Authors and Publishers* (London: John Russell Smith, printed for the author, 1867), 57–91, on p. 76–77.

Appendices

Appendix 1: Bibliography of Ellis's Writings

The following bibliography contains all Ellis's writings, divided into three categories: mathematics, philosophy and miscellaneous. The mathematical list has been kindly compiled by Tony Crilly.

CMJ = Cambridge Mathematical Journal
CDMJ = Cambridge and Dublin Mathematical Journal
SEH = Spedding-Ellis-Heath edition of *The Works of Francis Bacon*
TCL = Trinity College Library, Cambridge
TCPS = Transactions of the Cambridge Philosophical Society

Mathematics

Pagination appearing without square brackets refers to the first edition of *CMJ*, published by E. Johnson, Trinity Street, Cambridge. Pagination in square brackets refers to *CMJ* [Second Edition] published in 1846 with a new publisher, Macmillan, Barclay and Macmillan, Cambridge. Apart from the first volume, subsequent volumes ran over a two-year period with numbers brought out in November, February, and May in agreement with the academic year.

Reference is made to *The Mathematical and Other Writings of Robert Leslie Ellis, M.A.* William Walton, ed. (Cambridge: Deighton, Bell & Co., 1863) as *Coll. Works*.

As an undergraduate

Ellis, Robert Leslie. 1839a. On some properties of the parabola – Circumscribing hexagon and triangle, *CMJ* 1:5 (February 1839): 204–208, [224–228]. = *Coll. Works*: 63–67.

L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0

– 1839b. On the existence of a relation among the coefficients of the equation of the squares of the differences of the roots of an equation, *CMJ* 1:6 (May 1839): 256–259, [282–284]. = *Coll. Works*: 68–70. (Not listed in *Royal Society Catalogue of Scientific Papers*).
– 1839c. On the achromatism of eye-pieces of telescopes and microscopes, *CMJ* 1:6 (May 1839): 269–272, [296–299]. = *Coll. Works*: 71–74.
– 1839d. On the condition of equilibrium of a system of mutually attractive fluid particles, *CMJ* 2:7 (November 1839): 18–22. = *Coll. Works*: 75–80.
– 1839e. [Signed ϵ.] Mathematical notes 1. 'On a harmonic property' and 'On some properties of the parabola', *CMJ* 2:7 (November 1839): 47–48. = *Coll. Works*: 81.

After graduation

– 1840a. Variation of node and inclination, *CMJ* 2:9 (May 1840): 113–114. = *Coll. Works*: 82–83.
– 1840b. Investigation of the aberration in right ascension and declination, *CMJ* 2:9 (May 1840): 120. = *Coll. Works*: 84–85.
– 1840c. On the lines of curvature on an ellipsoid, *CMJ* 2:9 (May 1840): 133–138. = *Coll. Works*: 86–91.
– 1840d. [Signed ϵ.] Mathematical Note 2. 'Area of a polygon and a straight line and a plane at right angles', *CMJ* 2:9 (May 1840): 142–144. = *Coll. Works*: 92–93.

Fellow of Trinity College, Cambridge

– 1840e. On the tautochrone in a resisting medium, *CMJ* 2:10 (November 1840): 153–154. = *Coll. Works*: 94–96.
– 1840f. On the integration of certain differential equations I., *CMJ* 2:10 (November 1840): 169–177. = *Coll. Works*: 97–107.
– 1841a. On the integration of certain differential equations II., *CMJ* 2:11 (February 1841): 193–201. = *Coll. Works*: 108–117.
– 1841b. Analytical demonstrations of Dr. Matthew Stewart's theorems, *CMJ* 2:12 (May 1841): 271–276. = *Coll. Works*: 118–123.
– 1841c. Note on the definite integral $\int_0^{\frac{\pi}{2}} \log\left(\sin\theta\right) d\theta$, *CMJ* 2:12 (May 1841): 282–283. = *Coll. Works*: 124–125.
– 1842a. Remarks on the distinction between algebraical and functional equations, *CMJ* 3:14 (February 1842): 92–94. = *Coll. Works*: 126–129.
– 1842b. [Signed ϵ.] Mathematical note 3. 'Chord of a conic section' and 'planetary motion', *CMJ* 3:9 (February 1842): 94. = *Coll. Works*: 130–131.
– 1842c. On the solution of functional differential equations, *CMJ* 3:15 (May 1842): 131–138. = *Coll. Works*: 132–141.
– 1842d. [Signed ϵ.] Mathematical note 4. 'Problem from Math. Tripos 1842', *CMJ* 3:15 (May 1842): 152. = *Coll. Works*: 142.
– 1842e. On the evaluation of certain definite integrals, *CMJ* 3:16 (November 1842): 185–189. = *Coll. Works*: 143–148.

– 1843a. [Signed ϵ.] Mathematical note 5. 'Stability of eccentricities and inclinations', *CMJ* 3:18 (May 1843): 290–291. = *Coll. Works*: 149.
– 1843b. [Signed ϵ.] On the evaluation of definite multiple integrals, *CMJ* 4:19 (November 1843): 1–7. = *Coll. Works*: 150–156.
– 1843c. [Signed ϵ.] Mathematical note 6. 'Planes and surfaces', *CMJ* 4:19 (November 1834): 47–48. = *Coll. Works*: 157–159.
– 1844a. Note on the definite multiple integral, *CMJ* 4:20 (February 1840): 64–66. = *Coll. Works*: 160–162.
– 1844b. Notes on magnetism I. *CMJ* 4:20 (February 1844): 90–95, 139–143. = *Coll. Works*: 163–168.
– 1844c. On the foundations of the theory of probabilities, *TCPS* 8 (1844): 1–6. (Read 14 February 1842) = *Coll. Works*: 1–11.
– 1844d. On the method of least squares, *TCPS* 8 (1844): 204–219. (Read 4 March 1844). = *Coll. Works*: 12–37.
– 1844e. On a multiple definite integral, *CMJ* 4:21 (May 1844): 116–119. = *Coll. Works*: 169–172.
– 1844f. On a question in the theory of probabilities, *CMJ* 4:21 (May 1844): 127–133. = *Coll. Works*: 173–179.
– 1844g. On the balance of the Chronometer, *CMJ* 4:21 (May 1844): 133–137. = *Coll. Works*: 180–185.
– 1844h. Notes on magnetism II., *CMJ* 4:21 (May 1844): 139–143. = *Coll. Works*: 186–190.
– 1844i. [Signed ϵ.] Mathematical note 7. 'A definite integral [Bertrand's $\int_0^1 \frac{\log(1+x)}{1+x^2}\,dx$]', *CMJ* 4:21 (May 1844): 143. = *Coll. Works*: 191–192.
– 1844j. On the solution of equations in finite differences, *CMJ* 4:22 (November 1844): 182–190. = *Coll. Works*: 202–211.
– 1844k. Memoir of the late D.F. Gregory, M.A., Fellow of Trinity College, Cambridge, *CMJ* 4:22 (November 1844): 145–152. = *Coll. Works*: 193–201.
– 1844l. Sur les intégrals aux différences finies, *Journal de mathématiques pures et appliquées* 9 (December 1844): 422–434. = *Coll. Works*: 226–237 (extract.).
– 1846a. General theorems on multiple integrals, *CDMJ* 1: 1–10. = *Coll. Works*: 212–222.
– 1847. Recent progress of Analysis Theory (Theory of the Comparison of Transcendentals). *Report of the British Association for the Advancement of Science*. Annual Meeting of the British Association for the Advancement of Science, 1846, Southampton. (London: John Murray, 1847), 34–90. = *Coll. Works*: 238–323.

Post-Fellowship

– 1850a. Remarks on an alleged proof of the method of least squares, contained in the late number of the *Edinburgh Review*. In a letter addressed to Professor J.D. Forbes, *Philosophical Magazine* 37:251 (November 1850): 321–328. = *Coll. Works*: 53–61.

– 1850b. Note to a former paper on an alleged proof of the 'method of least squares', contained in a late number of the *Edinburgh Review*. In a letter addressed to Professor J.D. Forbes, *Philosophical Magazine* 37:252 (December 1850): 462. = *Coll. Works*: 62.
– 1852a. [Signed R.L.E.] Mathematical note 8. 'Solution of a functional equation', *CDMJ* 7: 103–104. = *Coll. Works*: 223.
– 1852b The course of mathematical studies in *Cambridge University Commission. Report of Her Majesty's Commissioners Appointed to Inquire into the State, Discipline, Studies, and Revenues of the University and Colleges of Cambridge; together with Evidence, and an Appendix* (London, 1852), 222–226. = *Coll. Works*: 417–427.
– 1854a. Remarks on the fundamental principle of the theory of probabilities, *TCPS* 9: 605–607. (Read 13 November 1854). = *Coll. Works*: 49–52.
– 1854b. On the area of the cycloid, (Communicated by W. Walton 31 July 1854.) *CDMJ* 9: 263–264. = *Coll. Works*: 224–225.
– 1855. Solution of a dynamical problem, in William Walton. *A Collection of Problems in Illustration of the Principles of Theoretical Mechanics*. 2nd Edition. (Cambridge: Deighton, Bell & Co., 1854), 540–541. = *Coll. Works*: 324–325.
– 1858. On the tautochronism of the cycloid, in *A Collection of Problems in Illustration of the Principles of Elementary Mechanics*. William Walton, ed. (Cambridge: Deighton, Bell and Co., 1858), 245–247. = *Coll. Works*: 326–327.
– 1863a. On Napier's rules, [Prepared for communication by Harvey Goodwin to the editor of the *Quarterly Journal of Mathematics*] = *Coll. Works*: 328–336.
– 1863b. On the retardation of sunrise = *Coll. Works*: 336.
– 1863c. A solution of problem IX. of the First Book of Newton's *Principia* = *Coll. Works*: 337–338.
– 1863d. On the theory of vegetable spirals = *Coll. Works*: 358–372.
– 1863e. Notes on Boole's *Laws of Thoughts* = *Coll. Works*: 391–394.

Philosophy

The Works of Francis Bacon, eds. James Spedding, Robert Leslie Ellis and Douglas Denon Heath (London: Longman and Co., 1857–1859) is abbreviated as *SEH*, followed by the volume number. Ellis's prefaces appeared in the first three volumes, containing Bacon's philosophical works, which were published in 1857.

All prefaces, except the 'Preface to the *Novum Organum*', on which Ellis worked while visiting France and Italy in 1849 but which he left unfinished, were written during Ellis's Fellowship at Trinity College, Cambridge. Ellis handed over his Bacon papers to James Spedding early in 1853.

Ellis, Robert Leslie. 1857a. General preface to Bacon's philosophical works, *SEH* 1, 21–67.
– 1857b. Preface to the *Novum Organum*, *SEH* 1, 71–102.
– 1857c. Preface to the *Historia Ventorum*, *SEH* 2, 3–6.
– 1857d. Preface to the *Historia Vitae et Mortis*, *SEH* 2, 91–99.
– 1857e. Preface to the *Historia Densi et Rari*, *SEH* 2, 229–238.
– 1857d. Preface to the *Sylva Sylvarum*, *SEH* 2, 325–329.
– 1857e. Preface to *De Fluxu et Refluxu Maris*, *SEH* 3, 39–46.
– 1857f. Preface to *De Principiis atque Originibus secundum Tabulas Cupidinis et Coeli*, *SEH* 3, 65–77.
– 1857g. Preface to *Valerius Terminus*, *SEH* 3, 199–213.
– 1857h. Preface to *Descriptio Globi Intellectualis*, *SEH* 3, 715–726.

Miscellaneous

Ellis, Robert Leslie. [Signed 'R.L.E'.] 1841. LVII. Remarks on M. Mossotti's theory of molecular action, *Philosophical Magazine* (Series 3) 19:125 (1841): 384–387. [This paper is not included in the *Coll. Works*]
– 1848. Some remarks on the theory of matter, *TCPS* 8: 600–605. (Read 22 May 1848). = *Coll. Works*: 38–48.
– 1854. Value of Roman money, *The Journal of Classical and Sacred Philology* 1 (March 1854): 92–93. = *Coll. Works*: 415–416.
– 1863a. On Roman aqueducts = *Coll. Works*: 339–352.
– 1863b. On the form of bees' cells = *Coll. Works*: 353–357. (Read by William Whewell at the Annual Meeting of the British Association for the Advancement of Science, 1838, Leeds).
– 1863c. Some thoughts on comparative metrology = *Coll. Works*: 373–390.
– 1863d. Remarks on certain words in Diez's *Etymologisches Wörterbuch der romanischen Sprachen* (Etymological Dictionary of the Romance Languages) = *Coll. Works*: 395–399.
– 1863e. Some thoughts on the formation of a Chinese dictionary, and on the best mode of printing Chinese. In a letter to the Rev. J Power, M.A., Fellow of Clare Hall, and University Librarian = *Coll. Works*: 400–414. [Previously printed for private circulation, 1854. Signed 17 March 1854.]
– undated. The Delian problem, *TCL*, Add.Ms.c.67/139.

Appendix 2: Chronological List of Ellis's Mathematical Reading

The following chronological list gives all the mathematical books Ellis read before going up to Trinity College, Cambridge in 1836. The list has been kindly compiled by June Barrow-Green.

Author	Title	Year	First date in Ellis journal	Ellis age	Add MS	Cam[a]
Airy, George Biddell	*Mathematical Tracts on the Lunar and Planetary Theories, the Figure of the Earth, Precession and Nutation, the Calculus of Variations and the Undulatory Theory of Optics* Cambridge: J. Deighton & Sons [Note: 2nd edition published by J & J.J. Deighton]	1826 2nd edn 1831	26 March 1832	14	82.22	X
Azemar, L.P.V.M. & Garner, J.G.	*Trisection de l'angle, par L.P.V.M. Azemar, suivie de recherches analytiques sur le même sujet, par J.G. Garnier* Paris: Courcier	1809	30 March 1834	16	82.29	
Babbage, Charles	*An Essay towards the Calculus of Functions* Phil Trans of RS, 105, pp. 389–423	1815	9 April 1836	18	a.219.6	
Babbage, Charles	*On the Economy of Machinery and Manufactures* London: Charles Knight	1832	18 July 1832	14	82.25	
Biot, Jean Baptiste	*Traité de physique expérimentale et mathématique* Paris: Deterville	1816	27 April 1834	16	82.34	
Bonnycastle, John	*The Scholar's Guide to Arithmetic* London: J. Johnson	1780	24 Oct 1834	17	82.43	
Brewster, David	*A Treatise on Optics*, In: D. Lardner *The Cabinet of Natural Philosophy* London: Longman, Rees, Orme Brown, and Green	1831	29 Jan 1834	17	82.29	
Bridge, Bewick	*A Treatise on Mechanics: Intended as an Introduction to the Study of Natural Philosophy* London: T. Cadell and W. Davies	1813–14	8 March 1829	11	82.5	
Brinkley, John	*Elements of Astronomy* London: R.E. Mercier and Longman and Co.	1819	18 Nov 1821	14	82.27	

Carnot, Lazare	*La théorie des transversales* Paris: Courcier	1806	30 May 1831	13	82.15	
Coddington, Henry	*An Elementary Treatise on Optics* Cambridge: J. Deighton & Sons	1823 2nd edn 1825 3rd 1829	27 Dec 1833	16	82.38	X
Cresswell, Daniel	*An Elementary Treatise on the Geometrical and Algebraical Investigation of Maxima and Minima; being the Substance of a Course of Lectures, delivered conformably to the Will of Lady Sadler. To which is added, a Selection of Propositions, deducible from Euclid's Elements*. Cambridge: J. Deighton & Sons	1812 2nd edn 1817	24 March 1833	15	82.30	X
Delambre, Jean Baptiste Joseph	*Histoire de 'lastronomie ancienne* *Histoire de l'astronomie du moyen age* *Histoire de l'astronomie modern* Paris: Courcier	1817 1821 1819	29 Apr 1832	14	82.23	
Euclid	*The Elements*	1762 (English edition) 22nd edn 1827	25 June 1830	12	82.9	
Euler, Leonhard	*Elements of Algebra*. [Chapter 5: 'Of figurate, or polygonal numbers'] Trans. from the French by John Hewlett. London: Longman, Hurst, Rees, Orme and Co.	1770 (original German edition) 1784 (French edition) 1797 (1st English edition) 3rd English edition 1822	30 Nov 1833	16	82.38	
Fontenelle, Bernard de	*Éléments de la géométrie de l'infini. Suite des Mémoires de l'Académie Royale des Sciences* Paris	1727	5 April 1836	18	a.219.6	
Fourier, Joseph	*Théorie analytique de la chaleur*	1822	10 April 1836	18	a.219.6	

(continued)

Appendix 2 (continued)

Author	Title	Year	First date in Ellis journal	Ellis age	Add MS	Cam[a]
Gregory, Olinthus	*A Treatise of Mechanics: Theoretical, Practical, Descriptive* London	1806 4th edn 1826	19 Sept 1830	13	82.11	
Hamilton, Henry Parr	*An Analytical System of Conic Sections: Designed for the Use of Students in the University* Cambridge: J. & J.J Deighton	1828	14 April 1829	11	82.6	X
Hamilton, Henry Parr	*The Principles of Analytical Geometry: Designed for the Use of Students in the University* Cambridge: J. Deighton & Sons	1826	20 June 1830	12	82.8	X
Herschel, John	*A Treatise on Astronomy* In: D. Lardner *Cabinet Encyclopaedia* London: Longman, Rees, Orme Brown, Green, & Longman	1833	1 June 1833	15	82.32	
Higman, John	*A Syllabus of Differential and Integral Calculus, 2 vols* Cambridge: Harwood & Hall	1826, 1828	28 Feb 1831	13	82.13	X
Hind, John	*The Principles of the Differential Calculus: With its Applications to Curves and Curve Surfaces: Designed for the Use of Students in the University* Cambridge	1831	21 May 1832	14	82.24	X
Hopkins, William	*Elements of Trigonometry* London: Baldwin and Cradock	1833	18 Aug 1834	16	82.41	
Hustler, James Devereux	*The Elements of the Conic Sections with the Sections of the Conoids* Cambridge: J. Deighton & Sons	1820	5 May 1829	11	82.5	X
Hutton, Charles	*Mathematical Tables containing Common, Hyperbolic, and Logistic Logarithms … With the Compleat Description and Use of the Tables* London: G.C.J. and J. Robinson, and R. Baldwin	1785	9 May 1829	11	82.5	
Hutton, Charles	*A Mathematical and Philosophical Dictionary. 2 vols. Article on Series* London: J. Davis	1795 2nd edn 1815	10 Mar 1833	15	82.31	

Hymers, John	*A Treatise on Analytical Geometry of Three Dimensions: Containing the Theory of Curve Surfaces and of Curves of Double Curvature* Cambridge: J & J.J. Deighton	1830	25 Mar 1831	13	82.14	X
Jephson, Thomas	*The Fluxional Calculus, an Elementary Treatise, 2 vols.* London: Baldwin, Cradock, and Joy	1826–1830	9 Aug 1830	12	82.8	
Kater, Henry**, & Lardner,** Dionysius	*Treatise on Mechanics* In: D. Lardner *The Cabinet of Natural Philosophy* London: Longman, Rees, Orme Brown, and Green	1830	24 Dec 1830	13	82.12	
Lacroix, Sylvestre François	*An Elementary Treatise on the Differential and Integral Calculus*. Tr. Babbage, Herschel & Peacock	1816	25 Feb 1833	15	82.30	
	Cambridge: J. Deighton and Sons					X
La Hire, Philippe de	Nouveaux elemens des sections coniques, les lieux geometriques, la construction, ou effection des equations Paris: Pralard	1679	8 July 1829	11	82.7	
Laplace, Pierre-Simon	*Exposition Du systême Du Monde* Paris: Cercle-Social	1795	11 Nov 1832	15	82.27	
Lardner, Dionysius	*An Elementary Treatise on the Differential and Integral Calculus* London: J. Taylor	1825	19 Mar 1830	12	82.7	
Lardner, Dionysius	*A Treatise of Algebraic Geometry* London: Whittaker, Treacher, and Arnot	1831	18 Feb 1832	14	82.22	
Legendre, Adrien-Marie	*Elements of Geometry and Trigonometry* Edinburgh: Oliver and Boyd	1822	20 June 1827	9	82.3	
Leslie, John	*The Philosophy of Arithmetic; exhibiting a Progressive View of the Theory and Practice of Calculation* Edinburgh: William and Charles Tait	1820	9 Dec 1832	15	82.27	
Leslie, John	*Elements of Geometry, Geometrical Analysis and Plane Trigonometry* [Porisms] Edinburgh	1809 4th edn 1820	19 Nov 1832	15	82.27	

(continued)

Appendix 2 (continued)

Author	Title	Year	First date in Ellis journal	Ellis age	Add MS	Cam[a]
Lloyd, Humphrey	*A Treatise on Light and Vision* London: Longman, Rees, Orme, Brown, and Green	1831	27 Dec 1833	16	82.38	
Maclaurin, Colin	*A Treatise on Fluxions. 2 vols.*		1 July 1833	15	82.33	
	Edinburgh: T.W. and T. Ruddimans	1742				
	London: William Baynes	2nd edn 1801				
Maddy, Watkin	*Plane Astronomy* Cambridge: J. Deighton & Sons	1826	26 Apr 1833	16	82.32	X
Monge, Gaspard	*Géométrie descriptive* Paris: Bachelier	1795 5th edn 1827	7[8] October 1833	16	82.36	
Montucla, Jean-Étienne	*Histoire des mathématiques* Paris: Agasse	1799–1802	16 Nov 1832	15	82.27	
Montucla, Jean-Étienne	*Histoire des recherches sur la quadrature du cercle* Paris: Bachelier	1754 1831	21 Nov 1833	16	82.38	
Ottley, William Campbell	*A Treatise on Differential Equations, with a collection of examples* Cambridge	1832	14 Jan 1833	15	82.28	X
Peacock, George	*A Collection of Examples of the Applications of the Differential and Integral Calculus* Cambridge: J. Deighton and Sons	1820	28 Aug 1834	17	82.42	X
Peacock, George	*A Treatise on Algebra* Cambridge: J & J.J. Deighton	1830	30 July 1833	15	82.34	X
Peacock, George	*A Syllabus of a Course of Lectures upon Trigonometry, and the Application of Algebra to Geometry* Cambridge: J. & J.J. Deighton	1833	16 June 1833	15	82.33	X
Pearson, William	*An Introduction to Practical Astronomy* London: Printed for the Author	1824	12 Sept 1830	14	82.11	
Playfair, John	*On the Origin and Investigation of Porisms* *Transactions of the Royal Society of Edinburgh* Vol 3, pp. 1–48	1782	8 Dec 1832	15	82.27	

Powell, Baden	*A Short Treatise on Experimental and Mathematical Optics* Oxford: D.A. Talboys	1833	23 Dec 1832	15	82.28	
Powell, Baden	*History of Natural Philosophy from the Earliest Periods to the Present Time* In: D. Lardner *The Cabinet Cyclopaedia* London: Longman, Rees, Orme Brown, Green, & Longman	1834	30 Jan 1834	16	82.29	
Puissant, Louis	*Mémoire sur la projection de Cassini* Paris: Courcier	1812	24 April 1833	15	82.32	
Ross, John Alexander	*Hirsch's Collection of Examples, Formulae, & Calculations on the Literal Calculus and Algebra* London: Black, Young and Young	1827	27 Feb 1829	12	82.5	
Singer, George John	*Elements of Electricity and Electro-Chemistry* London: Longman, Hurst, Rees, Orme, and Brown	1814	23 March 1829	12	82.6	
Vince, Samuel	*The Elements of the Conic Sections, as preparatory to the reading of Sir I. Newton's* Principia Cambridge	3rd edn 1827	28 Feb 1829	11	82.5	X
Whewell, William	*A Treatise on Dynamics, containing a considerable collection of mechanical problems* Cambridge: J. Deighton & Sons	1823	29 Feb 1832	14	82.22	X
Whewell, William	*An Introduction to Dynamics, containing the laws of motion and the first three sections of the Principia* Cambridge: J. and J.J. Deighton	1832	27 Feb 1833	15	82.30	X
Whewell, William	An Elementary Treatise on Mechanics Cambridge J. and J.J. Deighton	1819 3rd edn 1828	20 Feb 1833 ("began for the second time")	16	82.30	X
Whewell, William	*First Principles of Mechanics: with Historical and Practical Applications* Cambridge: J. and J.J. Deighton	1832	16 June 1833	15	82.33	X

(continued)

Appendix 2 (continued)

Author	Title	Year	First date in Ellis journal	Ellis age	Add MS	Cam[a]
Wood, James	*The Elements of Algebra* Cambridge	1795 9th edn 1830	25 Jan 1834	17	82.29	X
Wood, James	*The Elements of Optics* Cambridge	1799 4th edn 1818	23 April 1833	16	82.32	X
Wright, John Martin Frederick	*Self-Examinations in Algebra* London: Black, Young and Young	1825	27 Feb 1829	11	82.5	X
Wright, John Martin Frederick	*Solutions of the Cambridge Problems, from 1800 to 1820, 2 vols.* London: Black, Young and Young	1825	28 May 1830	13	82.8	X
Young, John Radford	*An Elementary Treatise on Algebra Theoretical and Practical; with attempts to simplify some of the more difficult parts of the science, etc.* London: G. and W.B. Whittaker	1823	16 Mar 1829	12	82.6	

[a]This column identifies whether a book was published in Cambridge, as these would be the most likely ones to be used by students there

Appendix 3: Chronological List of Ellis's Diaries

Ellis's diaries are found in the Whewell Papers at Trinity College Library, Cambridge. The surviving series begins in 1827 and ends in 1845; the several gaps being mostly of Ellis's own making.

Add.Ms.a.82/3: 27 May 1827–25 June 1827
Add.Ms.a.82/4: 10–25 September 1827; 23–30 April 1829
Add.Ms.a.82/5: 1 March–25 July, 27 February–9 March 1829
Add.Ms.a.82/6: 12 March–21 April 1829
Add.Ms.a.82/7: 3 June–9 July 1829, 21 April – 12 May 1830
Add.Ms.a.82/8: 17 May–24 June 1830
Add.Ms.a.82/9: 24 June–31 July 1830
Add.Ms.a.82/10: 30 July–24 August 1830, 19–20 January 1831
Add.Ms.a.82/11: 24 August–19 December 1830
Add.Ms.a.82/12: 19 December 1830–27 January 1831
Add.Ms.a.82/13: 28 January–9 March 1831
Add.Ms.a.82/14: 28 March–18 April 1831
Add.Ms.a.82/15: 24 May–2 June 1831
Add.Ms.a.82/16: 19 June–12 July 1831
Add.Ms.a.82/17: 11–18 August 1831
Add.Ms.a.82/18: 6 September–2 October 1831
Add.Ms.a.82/19: 4–17 October; 26 October–12 November 1831
Add.Ms.a.82/20: 25 November 1831–2 January 1832
Add.Ms.a.82/21: 3 January–14 February 1832
Add.Ms.a.82/22: 16 February–29 March 1832
Add.Ms.a.82/23: 30 March–12 May 1832
Add.Ms.a.82/24: 15 May–24 June 1832
Add.Ms.a.82/25: 9 July–14 August 1832
Add.Ms.a.82/26: 15 August–21 September 1832
Add.Ms.a.82/27: 30 October–14 December 1832
Add.Ms.a.82/28: 16 December 1832–29 January 1833
Add.Ms.a.82/29: 7 January–9 April 1833
Add.Ms.a.82/30: 29 January–9 March 1833
Add.Ms.a.82/31: 10 March–21 April 1833
Add.Ms.a.82/32: 22 April–4 June 1833
Add.Ms.a.82/33: 5 June–23 July 1833
Add.Ms.a.82/34: 24 June–2 July 1833, 10 April – 2 May 1834, 1 July 1833
Add.Ms.a.82/35: 23 July–23 August 1833
Add.Ms.a.82/36: 25 August–18 October 1833
Add.Ms.a.82/37: 17 October–15 November 1833
Add.Ms.a.82/38: 16 November 1833–6 January 1834
Add.Ms.a.82/39: 3 May–4 June 1834
Add.Ms.a.82/40: 5 June–15 July 1834
Add.Ms.a.82/41: 16 July–18 August 1834

Add.Ms.a.82/42: 20 August–27 September 1834
Add.Ms.a.82/43: 28 September–15 November 1834
Add.Ms.c.67/142: 2 August–28 August 1835
Add.Ms.a.219/7: 1 January–24 February 1836
Add.Ms.a.219/6: 25 February–27 May 1836
Add.Ms.a.218/40: 29 May–26 August 1836
Ad. Ms.a.219/1: 7 November 1839–1 January 1839
Add.Ms.a.82/1: 1 January 1839–28 June 1840
Add.Ms.a.82/2: 29 June 1840–20 May 1841
Add.Ms.a..218/41: 10 November 1843–25 January 1844
Add. Ms.a.221/16: January 1845
Add.Ms.c..67/142: 2–28 August 1845

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[1] For Ellis's works, see Appendix 1 ('Bibliography of Ellis's Writings'). Primary works mentioned only briefly in the footnotes to Part I and Part II but not quoted or discussed are not included in the general bibliography; their complete bibliographic information is provided in the notes themselves.

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L. M. Verburgt (ed.), *A Prodigy of Universal Genius: Robert Leslie Ellis, 1817-1859*, Studies in History and Philosophy of Science 55,
https://doi.org/10.1007/978-3-030-85258-0