MORE-THAN-ONE HEALTH: HUMANS, ANIMALS, AND THE ENVIRONMENT POST-COVID

Edited by Irus Braverman

First published in 2023

ISBN: 978-1-032-27786-8 (hbk)
ISBN: 978-1-032-27788-2 (pbk)
ISBN: 978-1-003-29408-5 (ebk)

Chapter 1

ONE HEALTH

A "More-than-Human" History

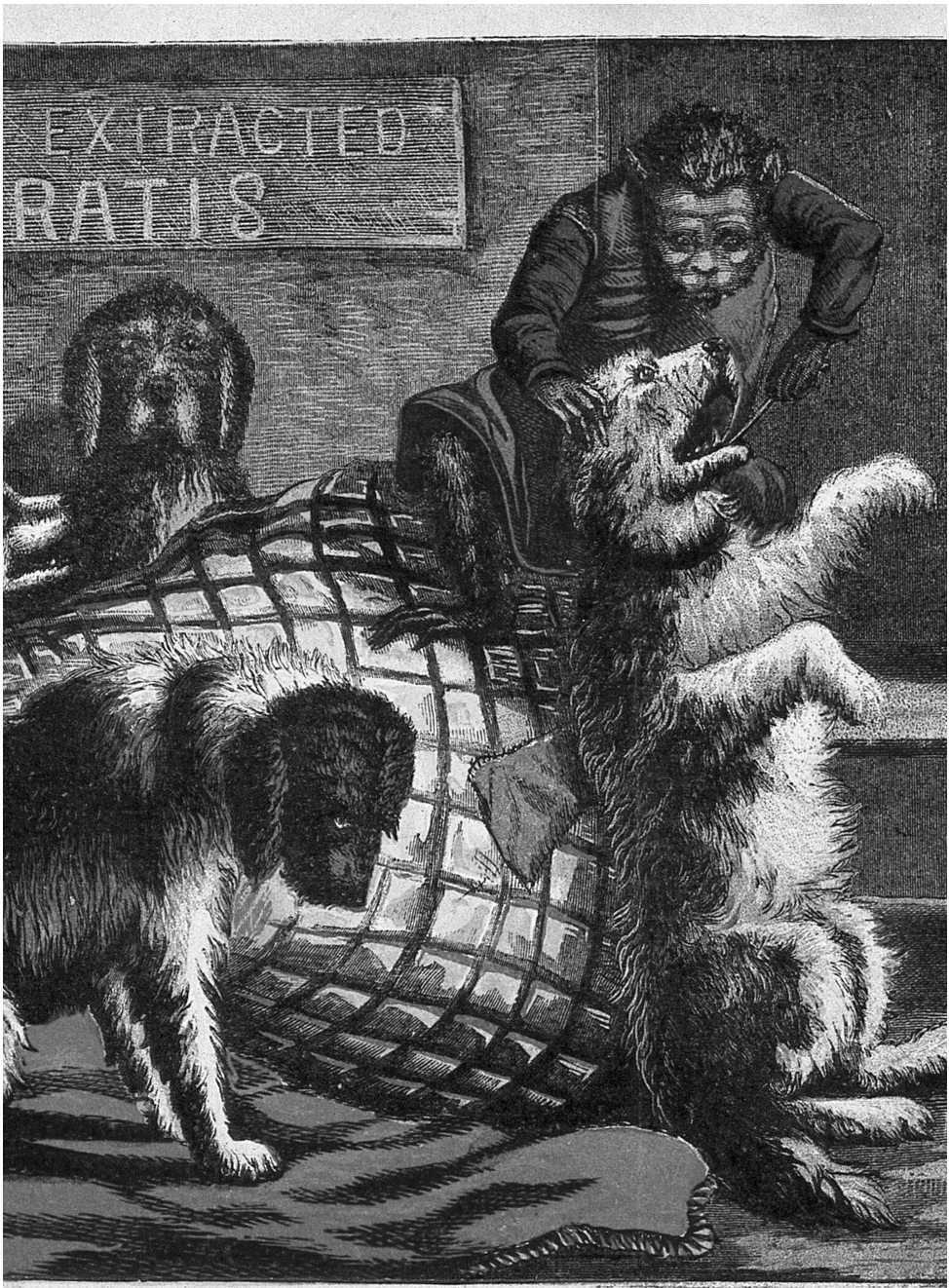
Abigail Woods

DOI: 10.4324/9781003294085-3

This OA chapter is funded by Wellcome Trust - Collaborative Award.

Routledge
Taylor & Francis Group
LONDON AND NEW YORK

earthscan
from Routledge



T.

S. BUT NOT HAPPY.

THE MONKEY DENTIST;

OR,

TEETH EXTRACTED GRATIS.

1

ONE HEALTH

A "More-than-Human" History

Abigail Woods

Introduction

The term "One Health" was first adopted in 2003 to describe an agenda for collaborative, cross-disciplinary working that "promotes health through interdisciplinary study and action, across all animal species."[1] The precipitating factor was the resurgent threat of zoonotic disease—initially SARS, and subsequently highly pathogenic avian influenza. Outbreaks of these diseases focused scientific and policy attention on the transmission of infections from animal to human populations. They also highlighted constraints to the sharing of knowledge and coordination of policy across international health organizations, which were caused by the disciplinary and institutional silos that separated human and animal health. As a consequence, calls were made for more effective, integrated working across health domains. These included a 2008 joint paper by the World Health Organization, World Organisation for Animal Health (formerly the Office International des Epizooties), and the Food and Agriculture Organization of the United Nations, and a follow-up statement in 2010, which reaffirmed the commitment of these organizations to One Health. New research and advocacy groups were formed to advance this agenda, and postgraduate training courses in One Health were established.[2]

Since then, the focus of One Health has expanded beyond zoonotic diseases to include numerous other threats to human and animal health, such as climate change, food insecurity, mental health, chronic diseases, and antimicrobial resistance.[3] Nevertheless, the analysis by Cassidy in 2017 of scientific citation databases revealed that zoonoses continue to dominate, and that, of the publications

FIGURE 1.1 Interior of a dentist's surgery with animal participants. Reproduction of a colored wood engraving. Credit: Wellcome Collection, public domain.

DOI: 10.4324/9781003294085-3

discussing One Health, over 60 percent appeared in veterinary science journals.[2] The topic has made limited inroads into infectious diseases and public health publications and features only infrequently in biomedical or environmental science journals. These findings suggest that One Health is struggling to achieve its interdisciplinary aspirations, and that, in spite of its intention to advance health across all species, it is primarily humans that are benefiting.[4]

Historically, however, there are many examples of health experts working in precisely the ways that are aspired to by today's One Health advocates, and with less anthropocentric objectives. Their activities are not represented adequately in the historical timelines that typically feature in One Health publications. These refer to the work of just a few, unrepresentative historical figures, such as Edward Jenner, Rudolph Virchow, Louis Pasteur, Robert Koch, William Osler, and Calvin Schwabe, whose selection is driven not by empirically grounded research into the history of One Health, but by the desire to raise its present-day profile.[5] Although medical historians have produced some accounts of zoonotic diseases and animal experimentation,[6] they have not gone nearly far enough in correcting the historical misrepresentation of One Health. This is probably because they share the mis-founded assumption, held also by One Health advocates, that medicine in the past was a human-centered endeavor, which took an interest in animals only when they threatened or had the potential to advance human health.[7] Here, I will challenge this assumption through a series of examples of how British practitioners of human medicine engaged with diseased animals over the period circa 1790–1900. These will reveal that in the relatively recent past, medical professionals paid far more attention to animal diseases and for a greater variety of reasons than are acknowledged today by historians and One Health advocates.

Various sources have been used in this analysis, including medical journals (notably *The Lancet* and *The British Medical Journal*), the records of medical and zoological societies, medical texts, public health reports, and the records of government commissions of enquiry into particular diseases. My approach to these sources aligns with recent aspirations to create "more-than-human" approaches to One Health.[8] It is informed by recent developments in human–animal studies, particularly animal history. Drawing on elaborations of actor–network theory, scholars in these fields have sought to challenge established anthropocentric worldviews by establishing animals as historical subjects and demonstrating their capacity to shape human society. Although animals are nonverbal creatures, they have left myriad traces on the medical historical record. Digital search tools are particularly useful in revealing these traces, as the insertion of species names produces numerous hits that would not be retrieved if the names of humans or diseases were used as the starting point of enquiry. Examination of these animal traces brings to light the zoological nature of human medicine, by revealing the extensive roles that animals played in shaping medical knowledge, practice, politics, and relationships. While this chapter is based on British sources from the period 1790–1900, its approach could easily be extended to reveal the

intersections of human and animal health that existed in different times and places.[9]

I will open by sketching out the contexts in which medically trained individuals engaged with diseased animals. This will reveal how the social worlds of doctors intersected with those of various nonhuman animal species. In Section Two, I direct attention to the scientific rationales and practices that characterized these engagements. While acknowledging the importance of zoonotic diseases, I also draw attention to the practice of comparing nonhuman and human diseases and to the ways in which medical activities aligned and intersected with those of the veterinary profession. Section Three will examine the inter-professional relationships that developed through this work. It will reveal examples of collaboration and—toward the end of the nineteenth century—growing conflict, as the veterinary profession attempted to extend its influence by claiming diseased animals for themselves. This conflict led to the hardening of professional boundaries, and subsequently to efforts to transcend them through precursors to today's One Health. In conclusion, I reflect on how this history might inform present-day efforts to develop post-anthropocentric approaches to health.

Section One

Analysis of surviving historical sources reveals that in Britain during the long nineteenth century, humans were not the only species to attract medical attention. Medical investigations and practices incorporated a host of nonhuman animals and were far more zoologically grounded than they are today. Doctors' interest in and approaches to diseased animals were powerfully influenced by their lived relations and experiences, as well as their intellectual interests and desire for social and scientific status both within and outside the profession. Heavy societal dependence on animals—as food, transport, companionship, entertainment, and cultural capital—made their diseases problematic, and meant there was much to be gained by addressing them. It also meant that animal bodies and habits were familiar to and readily accessible by doctors.[10]

Throughout this period, all medical men rode, and often had their own stables and carriages. Consequently, injured and diseased horses had a very real impact on their life and work. The late eighteenth century witnessed growing societal interest in large-scale horse racing, selective horse breeding, hunting on horseback, and the performance of cavalry horses. In this context, some surgeons began to specialize in farriery, to create infirmaries for horses, and establishments for training learned farriers. These establishments predated and formed the model for some of the first veterinary schools, in which doctors also played an influential shaping role.[11] Comparative anatomy was another cutting-edge field of medical enquiry at the turn of the nineteenth century.[12] One of its most avid students was the surgeon John Hunter, who amassed a famous collection of 13,682 specimens, representing 500 different species.[13] Interest in the subject drove medical men to participate in establishing zoological gardens as sites of

scientific enquiry, symbols of imperial conquest, and places for public education and entertainment. Zoos also offered opportunities for dissecting exotic animals that died there, and for overseeing their management in health and disease.[14]

Until the middle of the nineteenth century, more British people lived in rural than in urban areas. This granted many doctors, most famously Edward Jenner, plentiful opportunities for studying the natural history of animals, and making incidental discoveries about their diseases in the course of capturing, killing, dissecting, and displaying them.[15] As the century drew on, hunting, shooting, and fishing became increasingly popular leisure pursuits. Some medical participants were inspired to study the diseases of salmon, grouse, and other species which impacted on these sports by decimating populations of their animal subjects.[16] Doctors were also exposed frequently to agricultural animals, not simply in the countryside but also in towns, where horses and livestock were encountered regularly on their journeys to and from markets, and where milk was supplied largely by cows housed in urban dairies. Consequently, doctors took an interest in the mid-nineteenth century appearance of new and apparently contagious animal diseases like foot and mouth disease, contagious bovine pleuro-pneumonia, and in the devastating 1865–1867 epidemic of cattle plague (rinderpest).[17]

The impacts of urban slaughterhouses, cowsheds, and pigsties on human, animal, and environmental health attracted the attention of the emerging public health profession, as did growing evidence that the meat, milk, and wool of diseased livestock could spread diseases like tuberculosis and anthrax to humans.[18] Toward the end of the nineteenth century, additional paid opportunities for studying animal diseases opened up in universities and research institutions like the Brown Institute of Comparative Pathology.[19] However, throughout the period under investigation, the vast majority of doctors' enquiries into animal disease were pursued privately, in their own time and at their own expense. They shared their findings by creating specimens of animal diseases for inclusion in medical museums,[20] reporting their findings to meetings of medical societies,[21] and publishing books and articles in medical journals. They also received invitations from government to sit on, supply evidence to, and conduct scientific investigations on behalf of official committees of enquiry into animal diseases like cattle plague and bovine tuberculosis.[22]

Records of the Pathological Society of London, which was established in 1846 for the "cultivation and promotion of pathology," offer an illuminating insight into the diverse species that attracted medical attention. Membership of this popular organization peaked at over 700 in the 1880s and included members ranging from elite consultants to grassroots general practitioners, based in London, the provinces, and the colonies. Regular meetings were held to exhibit and discuss morbid specimens, which were then reported upon in the society's annual published *Transactions*.[23] Over the period 1846–1881, 230 separate reports appeared under the sub-heading "specimens of the lower animals." These ranged from individual case reports to lengthy expositions covering multiple species. Although they made up only 5 percent of the total specimen reports, 70 different authors were involved. This suggests that animals must have featured much

more widely in members' specimen-gathering activities, because the society only invited presentations of interesting or unusual cases.[24]

Many of those who presented animal specimens were not well known in their profession. However, those who exhibited most frequently did have a substantial profile. They included men like Charles Murchison, Jonathan Hutchinson, Richard Quain, Thomas Cobbold, and John Burdon Sanderson, who held positions in London hospitals, the Royal Colleges of Surgeons, the Royal Colleges of Physicians, and research institutes. This spread of participation suggests that engaging with animal diseases was not a marginal but a mainstream pathological activity for nineteenth century doctors. Farm animals featured most frequently in their reports, followed by zoo animals, pets, horses, wildlife (usually subjects of hunting, shooting, and fishing) and, most infrequently, experimental subjects. The accompanying text reveals the role of serendipity in bringing animal bodies to the attention of doctors. Some were doctors' own pets and livestock, or belonged to friends, family, or human patients. Some were literally stumbled upon in the street. There is also evidence of doctors actively seeking out diseased animals by means of familial, social, and professional contacts, which enabled them to access bodies on farms, zoos, grouse moors, and other settings.[25]

Section Two

Of the various reasons advanced by doctors to justify their scientific interest in diseased animal bodies, the one which overlaps most directly with present-day One Health was to understand and prevent the spread of disease from animals to humans. At the time, the most problematic zoonotic diseases were recognized as anthrax, glanders, tuberculosis, and rabies. Anthrax or "splenic fever" was a sporadic but potentially devastating disease of horses, sheep, and cattle, that was originally thought to be associated with particular soils. During the 1870s and 1880s, medical scientists discovered that it had the same bacterial cause as two diseases associated with the expanding textile industry: "woolsorters disease" (a fatal pneumonia) and "malignant pustule" (a skin disease). It transpired that the growth of the global wool trade was exposing western wool workers to anthrax spores contained in the fleeces of Asian and South African sheep. This discovery generated a range of responses: disinfection of fleeces offered direct protection to humans, while the development of serum and vaccines benefited both animal and human health.[26]

Glanders was a fatal respiratory disease spread by horses to humans who worked closely with them. Initial symptoms in horses were not obvious—they had runny noses and were slightly off-color—but in humans the disease was fatal. It was particularly a problem in cities like London, where horse numbers expanded in the nineteenth century alongside the development of railways and steamships. The 1892 discovery of mallein, a diagnostic product that could identify infected but asymptomatic horses facilitated its control. Produced by government laboratories and applied by civilian and military officials under compulsory

test-and-slaughter policies, it benefited human and horse health. By WWII, glanders had been eradicated from most of Europe and North America.[27]

Suspicions that tuberculosis could spread from cows to humans via meat predated Robert Koch's 1882 claim that the same bacterium was responsible for disease in both species. Late in the nineteenth century, its spread via milk attracted medical attention, as did the possible role of this substance—and the cows that produced it—in the spread of human typhoid, scarlet fever, and diphtheria. These health scares coincided with a growth in milk consumption that was driven by growing affluence, the development of the railway milk trade, the popularity of dairy farming, and use of poorly ventilated urban dairies that became known "hot beds" of the disease. Tuberculosis also had implications for meat consumption, which was highly valued, even by the lower classes, who were prepared to purchase meat of dubious provenance, provided it was cheap. The control of bovine tuberculosis was problematic because its symptoms in cows were not obvious until the disease was well advanced. Butchers, vets, and doctors laid rival claims to expertise in the identification and handling of diseased carcasses. Koch's controversial announcement in 1901, that tuberculosis in humans and cows were not, after all, identical diseases, created further confusion and controversy over the management of tuberculosis.[28]

Rabies aroused disproportionate fear and attention in nineteenth century Britain, owing to the horrific manner of death and its potential conveyancing by "man's best friend." Rabies scares coincided with the evolution of pet keeping and the Victorian "pedigree dog fancy." By transforming dogs into bestial killers, rabies challenged human efforts to reshape and domesticate them. In blaming urban street dogs for rabies spread, commentators drew on wider fears of their "human equivalents," the undisciplined, threatening lower and criminal classes. Efforts to control rabies through the enforced muzzling of dogs revealed marked contrasts in how public health doctors and dog owners perceived dogs. For doctors, dogs were potential conduits of disease, so they had to be disciplined, but, for many owners, dogs were family members whose compulsory muzzling by government diktat amounted to unjustifiable state intervention in the private sphere.[29]

A quite different reason for studying diseased animals was to compare and contrast their diseases by means of observation and dissection, and to use the findings to work out the relationships between species. Interest in interspecies relationships long predated the work of Charles Darwin. For example, for the eighteenth century surgeon John Hunter—whose extensive multispecies museum was donated after his death to the Royal College of Surgeons in London—differences in bodily structure and function translated into variations in disease. Through the cross-species comparison of normal and pathological bodies, the principles of life, disease, and death were revealed.[30] In the 1830s, the emergence of a philosophical form of comparative anatomy suggested that humans and animals were formed on the same general plan. In their efforts to comprehend it, medically trained comparative anatomists compared the anatomy and pathology of the

bodies and embryos of species ranging from simple, single-celled creatures up to humans.[31] This activity was facilitated by colonial conquest, because the desire to learn about and exploit the resources of colonial territories led to the importation of many exotic animals. These symbols of European sovereignty over alien and potentially dangerous environments were housed in menageries and zoological gardens, where doctors oversaw their health, and transformed them by dissection into museum specimens after death.[32]

The practice of interspecies comparisons was further boosted by the publication of Darwin's *On the Origin of Species*.[33] Its claim that all living organisms descended by evolution from a common ancestor encouraged doctors to study particular cases of animal pathology as exemplars of general pathological processes like inflammation or degeneration. They asked what bodily structures and functions were fundamental to all life, and how and why they went wrong in disease. What factors accounted for the differential expression of diseases in humans and other animals, and what did this mean for the classification of diseases? The comparative pathological project reached its zenith in the work of late nineteenth century London surgeon, John Bland Sutton, who set about tracing the evolutionary history of disease. Taking advantage of the high death rate and rich species coverage of the London Zoological Gardens, he dissected some 12,000 human and animal subjects between 1878 and 1886, and wrote lengthy articles on their organ systems that compared the manifestations of disease in different mammalian and some non-mammalian species.[34] He saw disease as both a driver to and a product of evolution, for "The laws of evolution apply to pathology as well as to the ordinary events of animal life."[35] This work led him to deduce the causes of rickets in humans from studying its spontaneous occurrence in monkeys living in the London Zoological Gardens.[36]

Comparing across species generated not only insights into disease pathology. Prior to the germ theory, some doctors engaged in a kind of comparative epidemiology. The fact that animal epidemics often seemed to coincide with—or precede—human epidemics suggested that there was a common atmospheric influence on them. Studying animal epidemics could therefore provide an early warning of human epidemics, and also generate general knowledge about the factors that were responsible for the rise and fall of epidemics in all species.[37]

Another mode of medical engagement with diseased animals, which is today regarded as the prerogative of the veterinary surgeon, was to diagnose, treat, and prevent their ailments. Prior to the creation of a British veterinary profession, eighteenth century surgeons-turned-farriers proclaimed that "physic" (conventional medicine) was the same whether practiced on humans or horses. They argued that farriery formed part of comparative anatomy, and was therefore a polite practice, well suited to a gentlemanly surgeon or physician. Britain's first veterinary school (The London Veterinary College) which was established in 1791, was informed by this thinking and by the medical practice of comparative anatomy. For the first 50 years of its existence, its activities and personnel were largely continuous with human medicine. Edward Coleman, a surgeon who

directed the school for over 40 years, modeled the structure and organization of veterinary education on that of human medicine. Prominent London doctors sat on the college's "medical examining committee," which examined students for their veterinary diplomas. They also invited veterinary students to the lectures they gave to London medical students. Some London medical students also took Coleman's optional courses in equine medicine and surgery. Many surgeons went further and enrolled at the London Veterinary College (later the Royal Veterinary College). By 1830, around 130 of them had qualified. Similar overlaps occurred in Edinburgh, where William Dick founded a veterinary school (later The Royal (Dick) School of Veterinary Studies) in 1823.[38]

According to one prominent commentator, Delabere Blaine, veterinary medicine was "a branch that has sprung from, and must grow with medicine as its parent stock," and in which advances were made "usually by the exertions of some enlightened physician or surgeon."[39] Surgeons' knowledge was highly relevant to the veterinary "art" because it enabled them to advance the "study of disease by analogy," to care for the sick bodies of their own horses, to treat other people's horses when no skilled farrier was available, and to enter veterinary practice. Another compelling reason arose in the context of the French revolutionary wars when the need for skilled equine care led to the commissioning of veterinary surgeons as officers to each regiment. This was a period in which medicine really was "One."[40]

During the 1820s and 30s, a number of qualified vets began to develop a shared identity separate from that of human medicine, and to agitate for formal recognition as a distinct profession. This was granted in 1844 with the creation by Royal Charter of a veterinary regulatory body, the Royal College of Veterinary Surgeons. However, doctors continued to bring the expertise they had honed on sick human bodies to bear on those of animals—particularly pets and zoo animals, of which vets had little knowledge or experience.[41] When the epidemic of cattle plague broke out in the London dairies in 1865, public health doctors, who were already supervising these institutions as part of their efforts to promote human and environmental health, were among the first to raise the alarm. They went on to study the cause and course of the disease, and to query its implications for humans who consumed meat and milk from infected animals. They brought specimens of diseased cows before the Pathological Society of London. Some drew parallels between the causes of cattle plague and a recent cholera outbreak in humans. They also reflected on the relationship between cattle plague in cows and typhoid and smallpox in humans, and carried out trials of therapies and preventives, including the use of smallpox vaccination.[42]

Section Three

Positioned at the nexus of human medicine, veterinary medicine, and comparative biology in the nineteenth century, diseased animals often inspired collaboration between members of the medical and veterinary professions. The

prime reason for coming together was to advance knowledge of the relationships between human and animal diseases. This included diseases that were suspected of transmission between animals and humans. For example, in his 1830 book on rabies, the veterinary surgeon, William Youatt, invited medical practitioners to "kindly send to my dissecting room quadrupeds labouring under rabies, or destroyed by it, that we may experiment on, or examine them together … I should feel exceedingly grateful, and both human and veterinary practice might probably be benefitted."[43] He subsequently superintended the dissection of a dog thought to have infected a child with rabies, in the presence of the doctors who attended the child.[44] Three years later, the roles were reversed when, at the invitation of the surgeon John Elliotson, Youatt attended an autopsy on a human patient thought to have died of glanders.[45] In each case, the pathological appearances of the dissected body were scrutinized to determine whether the disease was identical to that witnessed in the affected human or animal.

On other occasions, doctors and vets collaborated on studies of particular animal diseases that were not thought to transmit to humans, but whose pathology appeared to resemble that of a human disease, suggesting relationships between their causes or consequences. In 1848 and 1864, they worked together to investigate sheep suffering from a condition that strongly resembled smallpox in humans. Experiments highlighted key differences between the diseases, as well as points of similarity.[46] During the 1860s, medical investigators into "roaring" in horses and rickets in dogs sought out veterinary perspectives on these conditions, which enabled them to draw general conclusions about their pathology, causation, and expression in all affected species. Veterinary insights into cattle plague and swine fever also informed medical understandings of the relationships between these diseases and typhoid in humans.[47] Typically, these sorts of enquiries were motivated by personal interest and were conducted in private. They were characterized by harmonious working relationships that were grounded in mutual respect. Each party recognized the complementary nature of the other's skills and insights: veterinary surgeons tended to possess specific knowledge of a particular animal disease, which doctors incorporated into a wider comparative framework. Vets were often flattered to be consulted by doctors, whose profession had a much higher status than their own. This mode of collaborative working did not have a specific label attached to it—it simply represented a problem-driven response to a particular set of disease circumstances.

On other occasions, however, medical interest in animal diseases could provoke competition and conflict with members of the veterinary profession. This was more likely to happen when doctors investigated animal diseases as problems of animal health, rather than as points of comparison with human diseases. It also occurred in discussions over zoonotic diseases, when vets challenged the right of public health doctors to make recommendations relating to the management of animal as well as human bodies. Conflict was fueled by efforts to win legal recognition for veterinary medicine as a profession, and to improve its scientific and social standing. During the late nineteenth century, as the veterinary profession

grew more self-confident and ambitious, its members began to criticize medical pronouncements on animal diseases, to claim these diseases as exclusively veterinary subjects, and to seek recognition for themselves as experts capable of protecting humans from zoonotic diseases.[48]

Notable flash points included the 1865–1867 cattle plague epidemic, the management of bovine tuberculosis, and the prevention of milk-borne epidemics. As outlined above, cattle plague stimulated a raft of medical interventions that were aimed not simply at protecting the public from the effects of consuming meat and milk from infected animals, but also at preserving bovine life through preventive inoculations and therapeutic remedies. These latter activities stimulated widespread criticism from veterinary leaders, who argued that the disease was incurable and could only be managed by legislation that should be implemented by newly appointed veterinary inspectors.[49] In the case of bovine tuberculosis, inter-professional conflicts developed over the management of meat and milk from infected cows, as vets and doctors held different perceptions of the risks they posed to humans, and how they should be managed.[50] During the 1880s, leading public health doctors claimed to have identified a new condition in cows that they labeled "Hendon disease," and which appeared to be implicated in the transmission of scarlet fever, diphtheria, and possibly typhoid to humans via milk. Their veterinary opponents rubbished this diagnosis, claiming that the disease was simply cowpox, and that doctors had no clinical or epidemiological evidence for their claims.[51]

The early twentieth century development of new government funding streams for agricultural scientific research encouraged further veterinary efforts to solidify and police the profession's boundaries with human medicine. Leading vets sought to restrict funds for animal disease research to institutions created and run by vets, thereby excluding doctors. These efforts were not always successful. Nevertheless, when considered alongside the growing exclusion of animals from cities, and the professionalization of research activities, they did contribute to the lessening of private, spontaneous, medical engagements with diseased animals.[52] At the same time, medical attention was diverted away from animals as disease subjects, or points of comparison with humans, by the growth of experimental medicine. This narrowed the range of species studied, and refashioned animal subjects into "model" humans whose purpose was to illuminate and advance human health.[53]

Medical engagements with diseased animals did not disappear entirely. Throughout the twentieth century, as disease knowledge and research practices evolved, doctors pursued new animal disease subjects and modes of investigation. However, compared to its nineteenth century heyday, medicine became distinctly less zoological, and its boundaries with veterinary medicine were more distinct and difficult to traverse. Significantly, it was the hardening of these boundaries in the late nineteenth century that precipitated the first self-conscious efforts to encourage shared approaches to problems that crossed professional and disciplinary boundaries. Various labels were appended to this

activity: "comparative pathology," "comparative medicine," "veterinary public health," or "One Medicine." Its main protagonists and participants were veterinary surgeons, who were motivated by the desire to raise their professional profile through greater participation in human health agendas. Notably, although today's One Health is not a direct descendent of these movements, and claims a wider remit, it has retained some of their features. It is still a veterinary-driven activity that focuses particularly on zoonotic diseases and the advancement of human health.[54]

Conclusion

This brief survey has revealed that, in Britain during the long nineteenth century, the diseases of diverse animal species were of enduring interest to certain members of the medical profession. This interest was undoubtedly fueled by doctors' familiarity with, dependence on, and ease of access to animals, and by the historical continuities between human and veterinary medicine, which encouraged collaborative working across emerging professional boundaries. It enabled them to work unself-consciously across species boundaries, without feeling the need to justify or label their activities. Studying infectious diseases that were transmitted from animals to humans formed only one aspect of their search for cross-species insights and interventions, which aimed to advance both animal and human health, and achieve understandings of their similarities and differences.

It would be ahistorical to label these ways of working as "One Health." The concept did not yet exist, and the disciplinary boundaries which One Health aspires to overcome were much more porous than they are today. Nevertheless, for contemporary actors who are seeking to develop post-human, post-anthropocentric forms of health knowledge and practice, looking backwards to the history of British nineteenth century medicine may offer a more convincing model than the human-focused and veterinary-dominated activities that dominate current One Health agendas. Such agendas still carry the legacy of veterinarian attempts to enhance their professional standing by first erecting, and then spearheading attempts to transcend barriers between human and animal health, particularly through the medium of zoonosis control.

Through reframing what One Health is, was, and could become, this historical perspective has highlighted its unrealized, contemporary "more-than-human" possibilities. It has made visible the politics of present-day One Health, and the narrowness of its approach to interspecies health when compared with past ideas and practices. In demonstrating alternative ways of conceptualizing and practicing One Health, it has shown what this self-consciously interdisciplinary project has to gain by incorporating previously neglected perspectives from the humanities. Its historical examples also prompt questions about what other activities might already be underway, which transcend the boundaries of species but without feeling the need to brand themselves as "One Health." In the search for an anti-anthropocentric mode of health research and practice, it may prove more fruitful

to look at how experts are working rather than what agendas they claim to be pursuing.

Acknowledgements

This research was funded by the Wellcome Trust, grant number 092719/B/10/A. For the purpose of open access, the author has applied a Creative Commons CC BY public copyright license to any author accepted manuscript version arising from this submission.

Notes

1 Paul Gibbs, "The Evolution of One Health: A Decade of Progress and Challenges for the Future," *Veterinary Record* 174, no. 4 (2014): 85–91, 86.
2 Angela Cassidy, "Humans, Other Animals and 'One Health' in the Early Twenty-First Century," in *Animals and the Shaping of Modern Medicine*, eds. Abigail Woods et al. (Basingstoke: Palgrave, 2017), 193–236.
3 Jakob Zinsstag et al., eds., *One Health: The Theory and Practice of Integrated Health Approaches* (Oxford: CAB International, 2021).
4 Cassidy, "Humans, Other Animals," 193–236.
5 The best known of these accounts, which has informed all later iterations, is Calvin Schwabe, *Veterinary Medicine and Human Health* (Baltimore: Williams & Wilkins, 1984).
6 Nicolaas Rupke, ed., *Vivisection in Historical Perspective* (London: Routledge, 1990); Lisa Wilkinson, *Animals and Disease: An Introduction to the History of Comparative Medicine* (Cambridge: Cambridge University Press, 1992); Anita Guerrini, *Experimenting with Humans and Animals: From Galen to Animal Rights* (Baltimore: John Hopkins University Press, 2003); Keir Waddington, *The Bovine Scourge: Meat, Tuberculosis and Public Health, 1850–1914* (Woodbridge: Boydell Press, 2006); Neil Pemberton and Michael Worboys, *Mad Dogs and Englishmen: Rabies in Britain, 1830–2000* (Basingstoke: Palgrave Macmillan, 2007); Susan Jones, *Death in a Small Package: A Short History of Anthrax* (Baltimore: Johns Hopkins University Press, 2010).
7 Abigail Woods et al., *Animals and the Shaping of Modern Medicine* (Basingstoke: Palgrave, 2017).
8 Stephen Hinchliffe, "More than One World, More than One Health: Re-Configuring Interspecies Health," *Social Science & Medicine* 129 (2015): 28–35.
9 For a more expansive description of this approach and discussion of relevant literature, see Woods et al., *Animals*, 1–26.
10 Kathryn Kete, ed., *A Cultural History of Animals in the Age of Empire* (London: Bloomsbury, 2007).
11 Michael MacKay, "The Rise of a Medical Speciality: The Medicalization of Elite Equine Medical Care, 1680–1800" (PhD diss., University of York, 2009).
12 Andrew Cunningham, *The Anatomist Anatomis'd: An Experimental Discipline in Enlightenment Europe* (Farnham: Routledge, 2010).
13 Jessie Dobson, "John Hunter's Animals," *Journal of the History of Medicine and Allied Sciences* 17, no. 4 (1962): 479–486.
14 Abigail Woods, "Doctors in the Zoo," in *Animals and the Shaping of Modern Medicine*, eds. Abigail Woods et al. (Basingstoke: Palgrave, 2017), 27–69.
15 J. Baron, *The Life of Edward Jenner* (London: H. Colburn, 1838).
16 Thomas Henry Huxley, "A Contribution to the Pathology of the Epidemic Known as the 'Salmon Disease,'" *Proceedings of the Royal Society of London* 33, nos. 216–219

(1882): 380–389; Duncan George Forbes Macdonald, *Grouse Disease: Its Cause and Remedies* (London: W. H. Allen, 1883); Thomas Spencer Cobbold, *On the Destruction of Fish and Other Aquatic Mammals by Internal Parasites* (London, 1883).

17 J. N. Radcliff, "The State of Epidemic, Epizootic and Epiphytic Disease in Great Britain in 1861–1862," *Transactions of the Epidemiological Society of London* 1 (1863): 393–428; William Budd, "Variola Ovina, Sheep's Small-Pox: Or the Laws of Contagious Epidemics Illustrated by an Experimental Type," *British Medical Journal* 2 (1863): 141–150; Andrew Smart, *Reports to the Lord Provost and Magistrates of the City of Edinburgh on the Pathological Appearances, Symptoms, Treatment, and Means of Preventing Cattle Plague* (Edinburgh: MacLachlan & Stewart, 1866).

18 The annual *Reports of the Medical Officer to the Privy Council* provide many examples of these kinds of activities.

19 Graham Wilson, "The Brown Animal Sanitary Institution," *Journal of Hygiene* 83 (1979): 171–197.

20 *Catalogue of the Hunterian Collection in the Museum of the Royal College of Surgeons in London* (London: Richard Taylor, 1830).

21 *Transactions of the Pathological Society of London*, 1846–1910, *passim*.

22 *Third Report of the Commissioners Appointed to Inquire into the Origin and Nature, &c. of the Cattle Plague* (London: United Kingdom Parliament, 1866); *Royal Commission Appointed to Inquire into the Effect of Food Derived from Tuberculous Animals on Human Health* (London: United Kingdom Parliament, 1895).

23 H. R. Dean, "The Pathological Society of London," *Proceedings of the Royal Society of Medicine* 39, no. 12 (1946): 823–827.

24 *Transactions*, 1846–1910, *passim*.

25 *Transactions*, 1846–1910, *passim*.

26 Jones, *Death in a Small Package*.

27 Lise Wilkinson, "Glanders: Medicine and Veterinary Medicine in Common Pursuit of a Contagious Disease," *Medical History* 25 (1981): 363–384.

28 Michael French and Jim Phillips, *Cheated Not Poisoned? Food Regulation in the United Kingdom, 1875–1938* (Manchester: Manchester University Press, 2000); Waddington, *The Bovine Scourge*.

29 Pemberton and Worboys, *Mad Dogs*.

30 L. S. Jacyna, "Images of John Hunter in the Nineteenth Century," *History of Science* 21, no. 1 (1983): 85–108.

31 Anatomical Society, *Minute Book for 1833–1843* (held by Library of the University of Edinburgh).

32 Woods, "Doctors in the Zoo."

33 Charles Darwin, *On the Origin of Species by Means of Natural Selection* (London: John Murray, 1859).

34 Woods, "Doctors in the Zoo."

35 John Bland Sutton, *An Introduction to General Pathology* (London: Blakiston & Son, 1886), 376.

36 Dr. Cheadle, "Introductory Address: A Discussion on Rickets," *British Medical Journal* 2 (1882): 1145–1148.

37 Radcliff, "The State of Epidemic, Epizootic and Epiphytic Disease."

38 Abigail Woods, "From One Medicine to Two: The Evolving Relationship Between Human and Veterinary Medicine in England, 1791–1835," *Bulletin of the History of Medicine* 91 (2017): 494–523.

39 Delabere Blaine, *The Outlines of the Veterinary Art; Or, the Principles of Medicine: As Applied to the Structure, Functions and Economy of the Horse, the Ox, the Sheep and the Dog* (London: T. N. Longman and O. Rees and T. Boosey, 1802), viii.

40 Ibid.; Woods, "From One Medicine to Two."

41 Woods, "From One Medicine to Two."

42 William Budd, "Observations on Typhoid (Intestinal) Fever in the Pig," *British Medical Journal* 2, no. 239 (1865): 81–87, 81; William Budd, "The Siberian Cattle

Plague; or, the Typhoid Fever of the Ox," *British Medical Journal* 2, no. 242 (1865): 169–179; Charles Murchison, "On the Points of Resemblance Between Cattle-Plague and Small-Pox," *The Lancet* 86, no. 2209 (1865): 724–726; *Third Report of the Commissioners*; Smart, *Reports to the Lord Provost*.

43 William Youatt, *On Canine Madness* (London: 1830), 51–52.

44 Report from the Committee on the Bill to Prevent the Spreading of Canine Madness. *Parliamentary Papers* X (1830), 651: 685, 26–27.

45 St. Thomas's Hospital, "Glanders in the Human Subject," *Lancet* 19 (1833): 728–731.

46 J. B. Simonds, *A Practical Treatise on Variola Ovina, or Smallpox in Sheep* (London: 1848); J. F. Marson and J. B. Simonds, *Report of Experiments Made Under Direction of the Lords of the Council as to the Vaccination of Sheep and as to the Influence of Such Vaccination in Preventing Sheep Pox* (London: HMSO, 1864).

47 J. W. Ogle, "Drawing, Showing Atrophy of Muscles on One Side of the Larynx of a 'Roarer,'" *Transactions of the Pathological Society of London* 10 (1859): 339–347; Charles Murchison, "Intestines of a Pig," *Transactions of the Pathological Society of London* 10 (1859): 334; Budd, "Observations on Typhoid," 81; Budd, "The Siberian Cattle Plague."

48 Abigail Woods and Stephen Matthews, "'Little, If at All, Removed from the Illiterate Farrier or Cow-Leech': The English Veterinary Surgeon, c. 1860–85, and the Campaign for Veterinary Reform," *Medical History* 54 (2010): 29–54; Woods, "From One Medicine to Two."

49 Michael Worboys, "Germ Theories of Disease and British Veterinary Medicine, 1860–1890," *Medical History* 35 (1991): 308–327.

50 Keir Waddington, "'Unfit for Human Consumption': Tuberculosis and the Problem of Infected Meat in Late Victorian Britain," *Bulletin of the History of Medicine* 77, no. 3 (2003): 636–661.

51 Local Government Board: Supplement to Fifteenth Annual Report, containing Report of Medical Officer, 1885, *Parliamentary Papers* 1886 [C.4844-I]; Edgar Crookshank, "An Investigation into the So-Called Hendon Cow Disease, and Its Relation to Scarlet Fever in Man," *British Medical Journal* 2, no. 1407 (1887): 1317–1320, 1317; George Brown, *Report on Eruptive Diseases of Teats and Udders of Cows in Relation to Scarlet Fever in Man* (London: HMSO, 1888).

52 Abigail Woods, "From Co-ordinated Campaigns to Water-Tight Compartments: Diseased Sheep and Their Investigation in Britain, c. 1880–1920," in *Animals and the Shaping of Modern Medicine*, eds. Abigail Woods et al. (Basingstoke: Palgrave, 2017), 71–117.

53 Cheryl Logan, "Before There Were Standards: The Role of Test Animals in the Production of Empirical Generality in Physiology," *Journal of the History of Biology* 35, no. 2 (2002): 329–363.

54 Michael Bresalier, Angela Cassidy, and Abigail Woods, "One Health in History," in *One Health: The Theory and Practice of Integrated Health Approaches*, eds. Jakob Zinsstag et al. (Wallingford: CAB International, 2020), 1–14.