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Retrospectives: Unconventional paths

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I am the first to admit that my career has not followed a conventional path. But in talking to my colleagues, I am not sure that there is a conventional path to an academic career. This retrospective is both a look at how the profession has changed over the forty years since I began graduate school in the late 1970s, and a reflection on my own trajectory within that profession. Historiographical references reflect my own views and are not meant to be comprehensive. I first discovered the history of science as an undergraduate history major at Connecticut College in the early 1970s. The course of physics for non-majors I took with David Fenton was based on Harvard Project Physics, which had been developed in the 1960s by two professors of science education, F. James Rutherford and Fletcher G. Watson, and the historian of science Gerald Holton.[1] We actually wrote term papers for the class; mine was on the theory that Stonehenge was an astronomical observatory.

Although I knew I wanted to be a historian, history of science remained far from my mind. Reflecting my working-class background, I wanted to study the history of socialism and nineteenth-century labour movements, and as I learned more about English history, I decided I wanted to study English labour, preferably in England. I applied to graduate schools with this plan in mind and was delighted when I was admitted to Oxford, to do a second BA in modern history. At Oxford I became more and more enamoured with early modern Europe, thanks to my tutor Gillian Lewis, and I decided to do the special subject in the Scientific Revolution. Alistair Crombie and Charles Webster directed the two seminars in early modern science. As you might imagine, the content was somewhat different. It was my second encounter with passionate and incommensurable scholarly disagreement. The first had been the dressing-down of the Marxist historian Christopher Hill by J.H. Hexter in the pages of the *Times Literary Supplement*.[2] At the time I was attending Hill's lectures on the English Civil War, which were held in the dining hall of Balliol College. Hill was about to step down as master of Balliol, and his portrait already hung in the hall. It all felt a bit surreal.

I was assigned to Crombie's seminar at Trinity College but I also occasionally dropped in on Webster's at the Wellcome Unit on Parks Road. I saved up my money earned by typing catalogue cards in six languages at the Modern Languages Faculty Library

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For their comments, I wish to thank Benita Blessing, Lucinda Cole, Michael A. Osborne and Anna Marie Roos. They are not responsible for any of the opinions expressed herein.

1 Gerald Holton, 'Harvard project physics: a report on its aims and current status', *Physics Education* (1969) 4, pp. 19–25.

2 For a summary see William G. Palmer, 'The burden of proof: J.H. Hexter and Christopher Hill', *Journal of British Studies* (1979) 19, pp. 122–129. The *TLS* articles appeared in November 1975.

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(50p an hour, strictly under the table) and bought Webster's *Great Instauration* as well as Keith Thomas's *Religion and the Decline of Magic*. I still have them both. When I applied to graduate school in the US a few years later, it was in the history of science. In those pre-Internet days it was harder to compare institutions but a friend of mine from Connecticut College was at Indiana University (in history) and liked it, and IU offered me a good financial-aid package, so I chose to go to IU and entered as one of fifteen in the fall of 1978. At that point I had never been farther west than western New York State. Of those fifteen, I was the only one to complete the PhD, some five years later.

From the start at IU, I was a student of Richard S. Westfall, known as Sam (although I never called him Sam until after I received my PhD). At IU we plunged into the internalist–externalist debate which I had already encountered in Crombie versus Webster. I tended more toward the external side, but Sam fell in the internalist camp, although, as I soon found out, both the debate and Sam were more complicated than the labels indicated. It was certainly the case that he thought it was important to understand the science – *Force in Newton's Physics*, which I found quite daunting, had appeared a few years earlier.[3] I took his seminar on the *Principia*, which included working through all the maths. But I always found Sam to be open to other historiographical approaches. Prosopography or group biography was becoming popular in the history of science, and Sam dove into that with zeal.[4] My PhD dissertation, on Newtonian physicians in the last decade of the seventeenth century and the first decade of the eighteenth (between the first and second editions of the *Principia*) was a group biography.[5]

Sam hired me in 1979 as his research assistant to help him in the final stages of *Never at Rest*, his biography of Newton.[6] I checked all of his footnotes, working from a teetering pile of yellow legal pads in his library office. Those were the days when departmental secretaries typed faculty manuscripts, although I distinctly remember both Sam and Ed Grant buying Osborne computers, maybe around 1981. I read *Never at Rest* three times – in manuscript, in galleys and finally in page proofs – and realized what an incredible education I was getting in writing a scholarly book as well as in Newton. There were three proofreaders: Sam, his wife Gloria and I.

During my five and a half years at IU (one semester spent on exchange at the University of Wisconsin), I probably read more history of science than in any similar period before or since. Michael Osborne and Marsha Richmond introduced me to the work of Foucault and my paperback of *The Order of Things*, coffee-stained and heavily underlined, is an artefact of my time in Madison. For my dissertation I read lots of history of chemistry – not yet chymistry. The physicians in my dissertation did not do alchemy, although Sam,

3 R.S. Westfall, *Force in Newton's Physics*, London: Macdonald, 1971.

4 Steven Shapin and Arnold Thackray, 'Prosopography as a research tool in the history of science: the British scientific community, 1700–1900', *History of Science* (1974) 12, pp. 1–28. Sam's final project was a massive database of early modern scientists, which was carried on after his death by Robert Hatch at the University of Florida. See http://users.clas.ufl.edu/ufhatch/pages/03-Sci-Rev/SCI-REV-Home/resource-ref-read/major-minor-ind/westfall-dsb/index.htm.

5 Anita Guerrini, 'Newtonian matter theory, chemistry, and medicine, 1690–1713', PhD dissertation, Indiana University, 1983.

6 R.S. Westfall, *Never at Rest*, Cambridge: Cambridge University Press, 1980.

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like Betty Jo Dobbs and Karin Figala, was increasingly immersed in Newton's alchemy. It was a time for reading and weighing Arnold Thackray, Steven Shapin, Hélène Metzger, Robert Schofield, Piyo Rattansi and Ted McGuire, and Peg Jacob, and in history of medicine Bob Frank and Ted Brown, among others.[7] When I was in Britain in the fall of 1982 to do archival research, I met Simon Schaffer, who was introduced to me as 'the Mick Jagger of the history of science', and who gave me chapters from his own dissertation. Jim Secord gave me a xeroxed copy of *The Ferment of Knowledge*, that seminal volume on eighteenth-century science, which I stuffed into my suitcase for the trip back to Bloomington.[8] The field of the history of science seemed to me to be breaking open in the early 1980s, as I wrote my dissertation and the internal–external divide unravelled. Bob Frank's *Harvey and the Oxford Physiologists* especially influenced me at this time as a group biography with a vivid sense of time, place and personalities, which I tried to replicate with a different group of people at a slightly later time in my dissertation. My dissertation research forced me to get up to speed in the history of medicine as well, with Ann Carmichael as my guide. On that same research trip in 1982 I met Roy Porter, who subsequently became both a mentor and a friend, as he was for so many.

In the early 1980s I also became involved in the environmental movement, in reaction to the policies of Ronald Reagan's Secretary of the Interior James Watt, and began to read environmental history such as Don Worster's *Nature's Economy*. Bill Cronon's *Changes in the Land* came out in 1983, just as I was finishing my dissertation.[9] With the help of Fred Churchill at IU, I applied for a Mellon post-doc at the library of the American Philosophical Society (APS) with a proposal to compile an annotated bibliography of its collections on early American natural history. I had held a part-time job at IU's rare-book library, the Lilly Library, and summer jobs at the National Library of Medicine's History of Medicine Division, so I knew my way around rare books. I spent 1984–1985 in Philadelphia at the APS Library, and my bibliography, *Natural History and the New World*, appeared in 1986.[10]

7 Arnold Thackray, *Atoms and Powers*, Cambridge, MA: Harvard University Press, 1970; Hélène Metzger, *Atttraction universelle et religion naturelle chez quelques commentateurs anglais de Newton*, Paris: Hermann, 1938; Steven Shapin, 'History of science and its sociological reconstructions', *History of Science* (1982) 20, pp. 157–211; Shapin, 'Of gods and kings: natural philosophy and politics in the Leibniz–Clarke disputes', *Isis* (1981) 72, pp. 187–215; Robert Schofield, *Mechanism and Materialism*, Princeton, NJ: Princeton University Press, 1970; P.M. Rattansi and J.E. McGuire, 'Newton and the "Pipes of Pan"', *Notes and Records of the Royal Society* (1966) 21, pp. 108–143; Margaret C. Jacob, *The Newtonians and the English Revolution*, Ithaca, NY: Cornell University Press, 1976; Robert G. Frank Jr, *Harvey and the Oxford Physiologists*, Berkeley: University of California Press, 1980; Theodore M. Brown, 'From mechanism to vitalism in eighteenth-century English physiology', *Journal of the History of Biology* (1974) 7, pp. 179–216. This list is, of course, just the tip of the iceberg.

8 Simon Schaffer, 'Newtonian cosmology and the steady state', PhD thesis, Cambridge University, 1980; G.S. Rousseau and Roy Porter (eds.), *The Ferment of Knowledge: Studies in the Historiography of Eighteenth-Century Science*, Cambridge: Cambridge University Press, 1980.

9 Donald Worster, *Nature's Economy: The Roots of Ecology*, San Francisco: Sierra Club Books, 1977; William Cronon, *Changes in the Land*, New York: Hill and Wang, 1983.

10 Anita Guerrini, *Natural History and the New World, 1524–1770: An Annotated Bibliography*, Philadelphia: American Philosophical Society Library, 1986. An updated online edition appeared in 2002, at www.amphilsoc.org/guides/guerrini.

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After I left the APS in 1985, I spent a decade in temporary positions, seeking that elusive tenure-track job. I applied for lots of jobs, and had some interviews, but nothing panned out. I published several articles. While I was still in Philadelphia, I submitted my dissertation to a university press (this was common practice at the time) and received the rudest rejection letter I have ever received, from a senior male historian of science. I was crushed and never submitted the dissertation anywhere else. I received a grant from the National Science Foundation in 1987 for a revision and expansion of the dissertation but the project (as my projects seem to do) eventually turned into something quite different. I completed that book early in 1994 but it did not see the light of day until the year 2000. The book, on the Scottish Newtonian and physician George Cheyne (1671?–1743), marked out my subsequent path as an interdisciplinary scholar.[11] While I have always believed that the history of science is inherently interdisciplinary, Cheyne's story led me in addition to the history of mental illness, English literature, the history of religion and the history of food.

I know I was far from alone in this struggle to gain a footing in academia, and that young scholars today face an even steeper climb. As a woman from a working-class background (I was the first in my family to attend university; neither of my parents finished high school), I did not early acquire the social skills and professional knowledge that many of my peers took for granted.[12] While I had to learn on my own how to decipher academic codes and did not understand the sometimes bizarre internal dynamics of search committees, I received an excellent education at IU. But my professors of that era assumed that academic jobs were out there and available for the worthy. In fact, 1984, the year I entered the job market, was the worst year for history hires until 2009.[13] I received little training in how to write a CV and a job letter, how to do an interview (job interviews at professional meetings were then held in hotel rooms, often with the candidate sitting on the bed), or even how to interact at meetings. And, it must be said, I did not know enough to ask for help, since I assumed that everyone else already knew these things, and I did not want to reveal my ignorance. I think this has changed for the better, and I have tried to provide this training for my graduate students.

My case was complicated by a spouse who was also an academic, and, after 1988, by a child. After my husband got a tenure-track position at the University of California–Santa Barbara (UCSB), I pretty much gave up applying for jobs and taught at UCSB as an adjunct for several years. My appointment was term-to-term, so I never knew until the last minute whether I was going to be employed or not. I also taught every summer, usually Western Civilization. Through the efforts of a (female) provost at

11 Anita Guerrini, *Obesity and Depression in the Enlightenment: The Life and Times of George Cheyne*, Norman: University of Oklahoma Press, 2000. I have always hated the title. I must thank Bob Markley, who persuaded me to send the manuscript to the series he was then editing at Oklahoma.

12 An important book on this topic is Kathleen A. Welsch (ed.), *Those Winter Sundays: Female Academics and Their Working-Class Parents*, Lanham, MD: University Press of America, 2005.

13 Robert B. Townsend and Julia Brookins, 'The troubled academic job market for history', *Perspectives on History*, February 2016, at www.historians.org/publications-and-directories/perspectives-on-history/february-2016/the-troubled-academic-job-market-for-history. I should add that there were a lot more PhDs in 2009 than in 1984.

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UCSB, as well as behind-the-scenes efforts by my husband and the then chair of the History Department, I obtained a half-time tenure-track position in 1995, right when our second child was born. For the next nine years I was half-time, until I was promoted to full professor in 2004. I remember that when I was awarded tenure in 1999, my salary was the princely sum of $26,500, only slightly more than I had earned as a post-doc at the American Philosophical Society fifteen years earlier. Except for the money, being half-time was not necessarily a bad thing, but no half-time position is ever actually half-time, particularly if graduate students are in the mix. In 2008, I moved to Oregon State University as Horning Professor in the Humanities, a position I just retired from in January 2019.

My research interests changed pretty drastically during the late 1980s and the 1990s. My work on natural history at the American Philosophical Society led to an interest in the history of animals. Animal studies was then a nearly non-existent field. Keith Thomas's *Man and the Natural World* had appeared in 1983, and Harriet Ritvo's *The Animal Estate* in 1987, and that was about all of the scholarship in the pre-twentieth-century history of animals.[14] Other than works of advocacy, there was almost no scholarship specifically on the history of animal experimentation, particularly in the early modern era. Richard French's *Antivivisection and Medical Science in Victorian Society* (1975) remains a valuable resource but says nothing about the era before 1800. Nicolaas Rupke's 1987 edited volume *Vivisection in Historical Perspective* contained one article on premodern practices.[15] I published 'The ethics of animal experimentation in early modern England' in 1989.[16] From that point onward, the history of animal experimentation and the history of animal and human anatomy became my primary research focus. In 1992 I developed an undergraduate course on the history of animal experimentation (later expanded to include all uses of animals in science) that proved to be quite successful. Later, an editor at Johns Hopkins University Press asked me if I'd be interested in writing a history of animal and human experimentation for their new series Introductory Studies in the History of Science. I was, and *Experimenting with Humans and Animals* appeared in 2003.[17]

The history of premodern (human) anatomy was coming into its own in the 1990s. Heinrich von Staden's monumental work on Alexandrian physician Herophilus appeared in 1989; Roger French, Andrew Cunningham, Andrew Wear, Nancy Siraisi, Katharine Park, Jonathan Sawday and Andrea Carlino, among others, published

14 Keith Thomas, *Man and the Natural World*, London: Allen Lane, 1983; Harriet Ritvo, *The Animal Estate*, Cambridge, MA: Harvard University Press, 1987. Ritvo gives a good overview of animal history in the 1980s in the introduction to her *Noble Cows and Hybrid Zebras: Essays on Animals and History*, Charlottesville: University of Virginia Press, 2010, pp. 1–12.

15 Richard French, *Antivivisection and Medical Science in Victorian Society*, Princeton, NJ: Princeton University Press, 1975; A.H. Maehle and U. Tröhler, 'Animal experimentation from antiquity to the end of the eighteenth century', in Nicolaas Rupke (ed.), *Vivisection in Historical Perspective*, New York: Routledge, 1987, pp. 14–47.

16 Anita Guerrini, 'The ethics of animal experimentation in seventeenth-century England', *Journal of the History of Ideas* (1989) 50, pp. 391–407.

17 Anita Guerrini, *Experimenting with Humans and Animals: From Galen to Animal Rights*, Baltimore: Johns Hopkins University Press, 2003.

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important work.[18] While William Harvey had continued to be studied, few other premodern figures were. Siraisi commented in 1995 on the neglect of the history of anatomy by historians of medicine over the previous twenty or thirty years in favour of the social history of medical practice. This new emphasis on practices, she asserted, was now leading in turn to a new history of anatomy focused on practices as much as on theory.[19] Bob Frank's *Harvey and the Oxford Physiologists* again served as inspiration to me, now as much for its content as for its form. Ruth Richardson's *Death, Dissection, and the Destitute*, while not precisely early modern, was a model for me of passionate and engaged history, reminding me always that anatomy is about the dissected as well as the dissectors.[20] On one of our trips to France in the 1990s I acquired a copy of Jacques Roger's *Sciences de la vie*, which I read avidly. By this time I had begun to look beyond my previous focus on Britain to France, finding that the history of French anatomy was even more neglected than that in other countries, although Claire Salomon-Bayet's work was a significant exception.[21]

Another NSF grant in 1999, along with a year in France on my first-ever sabbatical (although of course I had had plenty of time 'off' in the past), launched me on an ambitious (too ambitious, in retrospect) project on animals and anatomy in early modern Europe. This project, after many twists and turns, eventually became *The Courtiers' Anatomists*, as well as a number of articles.[22]

18 Heinrich von Staden, *Herophilus*, Cambridge: Cambridge University Press, 1989; Roger French, *Dissection and Vivisection in the European Renaissance*, Burlington, VT: Ashgate, 1999; Andrew Cunningham, *The Anatomical Renaissance*, Aldershot: Scolar Press, 1996; Andrew Wear, 'Introduction', in William Harvey, *The Circulation of the Blood and Other Writings*, trans. K.J. Franklin, London: J.M. Dent, 1990, pp. v–xv; Nancy Siraisi, *Medieval and Renaissance Medicine*, Chicago: The University of Chicago Press, 1990; Katharine Park, 'The criminal and the saintly body: autopsy and dissection in Renaissance Italy', *Renaissance Quarterly* (1994) 7, pp. 1–33; Park, 'The life of the corpse: division and dissection in late medieval Europe', *Journal of the History of Medicine and Allied Sciences* (1995) 50, pp. 111–132; Jonathan Sawday, *The Body Emblazoned: Dissection and the Human Body in Renaissance Culture*, New York: Routledge, 1995; Andrea Carlino, *Books of the Body: Anatomical Ritual and Renaissance Learning*, trans. John Tedeschi and Anne C. Tedeschi, Chicago: The University of Chicago Press, 1999; *Early Anatomy in Comparative Perspective*, special issue of *Journal of the History of Medicine and Allied Sciences* (1995) 50(1); Domenico Bertoloni Meli (ed.), *Marcello Malpighi: Physician and Anatomist*, *Nuncius* (1997) 27.

19 Nancy Siraisi, 'Introduction', in *Early Anatomy in Comparative Perspective*, op. cit. (18), pp. 3–10, 10.

20 Ruth Richardson, *Death, Dissection, and the Destitute*, London: Routledge, 1988.

21 Jacques Roger, *Les sciences de la vie dans la pensée française au XVIIIe siècle*, nouvelle édition, Paris: Albin Michel, 1993; translated as *The Life Sciences in Eighteenth-Century French Thought* (ed. Keith Benson, trans. Robert Ellrich), Stanford, CA: Stanford University Press, 1997. Claire Salomon-Bayet, *L'institution de la science et l'expérience du vivant*, Paris: Flammarion, 1978.

22 Anita Guerrini, *The Courtiers' Anatomists: Animals and Humans in Louis XIV's Paris*, Chicago: The University of Chicago Press, 2015; articles that were not part of the book project include Guerrini, 'Duverney's skeletons', *Isis* (2003) 94, pp. 577–603; Guerrini, 'Anatomists and entrepreneurs in early eighteenth-century London', *Journal of the History of Medicine and Allied Sciences* (2004) 59, pp. 219–239; Guerrini, 'The creativity of God and the order of nature: anatomizing monsters in the early eighteenth century', in Charles Wolfe (ed.), *Monsters and Philosophy*, London: KCL Press, 2005, pp. 153–168; Guerrini, 'Alexander Monro primus and the moral theatre of anatomy', *The Eighteenth Century: Theory and Interpretation* (2006) 47, pp. 1–18; Guerrini, 'Advertising monstrosity: broadsides and human exhibition in early eighteenth-century Britain', in Patricia Fumerton and Anita Guerrini, with Kris McAbee (eds.), *British Ballads and Broadsides, 1500–1800*, Burlington, VT: Ashgate, 2010, pp. 109–127; Guerrini,

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The history of early modern anatomy has blossomed into a rich and flourishing field, with many talented historians, including Domenico Bertoloni Meli, Brad Bouley, Lucia Dacome, Maria-Pia Donato, Marieke Hendriksen, Cynthia Klestinec, Rina Knoeff, Raphael Mandressi, Daniel Margócsy and Rebecca Messbarger.[23] It merges with the 'history of the body' pioneered by Roy Porter, with histories of craft and artisanal knowledge, with histories of art and representation, with institutional history and the histories of professions, and with histories of museums, collecting and display.

As I argued in my article 'The ghastly kitchen', the history of anatomy also merges (gruesomely, I admit) with the history of food, in that dissection and food preparation often occurred in the same places and employed the same tools.[24] I had begun looking at the history of food, particularly the history of vegetarianism, in my work on George Cheyne.[25] Over twenty years ago, as book-review editor of *Early Science and Medicine*, I commissioned a group of reviews of books on culinary history, asserting that the history of food and the history of science had much in common.[26] These intersections began in the 1990s with Rachel Laudan's influential work on changes in European, and particularly French, cuisine in the seventeenth century, which she attributed to the influence of chymical physicians at the French court. Since then have appeared, among other works, a special issue of *Studies in the History and Philosophy of Biological and Biomedical Sciences* edited by Emma Spary and Barbara Orland, Emma Spary's two volumes and numerous articles on seventeenth- and eighteenth-century French cuisine and science, work by Elizabeth Williams on digestion in the eighteenth century, and my own work on food, health and natural history.[27]

'The value of a dead body', in Helen Deutsch and Mary Terrall (eds.), *Vital Matters*, Toronto: University of Toronto Press, 2012, pp. 246–264; Guerrini, 'Experiments, causation, and the uses of vivisection in the first half of the seventeenth century', *Journal of the History of Biology* (2013) 46, pp. 227–254; Guerrini, 'The hermaphrodite of Charing Cross', in Larry Stewart and Erika Dyck (eds.), *The Uses of Humans in Experiment*, Leiden: Brill, 2016, pp. 28–52.

23 Domenico Bertoloni Meli, *Mechanism, Experiment, Disease*, Baltimore: Johns Hopkins University Press, 2011; Bertoloni Meli, *Visualizing Disease*, Chicago: The University of Chicago Press, 2018; Bradford Bouley, *Pious Postmortems*, Philadelphia: University of Pennsylvania Press, 2017; Lucia Dacome, *Malleable Anatomies*, Oxford: Oxford University Press, 2017; Maria-Pia Donato, *Morte improvvisi*, Rome: Carocci, 2010; translated as *Sudden death*, trans. Valentina Mazzei, Burlington, VT: Ashgate, 2014; Marieke Hendriksen, *Elegant Anatomy*, Leiden: Brill, 2015; Cynthia Klestinec, *Theaters of Anatomy*, Baltimore: Johns Hopkins University Press, 2011; Rina Knoeff and Robert Zwijnenberg (eds.), *The Fate of Anatomical Collections*, Burlington, VT: Ashgate, 2015; Raphael Mandressi, *Le regard de l'anatomiste*, Paris: Seuil, 2003; Daniel Margócsy, *Commercial Visions*, Chicago: The University of Chicago Press, 2014; Daniel Margócsy, Mark Somos and Stephen N. Joffe, *The Fabrica of Andreas Vesalius: A Worldwide Descriptive Census, Ownership, and Annotations of the 1543 and 1555 Editions*, Leiden: Brill, 2018; Rebecca Messbarger, *The Lady Anatomist*, Chicago: The University of Chicago Press, 2010.

24 Anita Guerrini, 'The ghastly kitchen', *History of Science* (2016) 54, pp. 78–104.

25 Anita Guerrini, 'A diet for a sensitive soul: vegetarianism in eighteenth-century Britain', *Eighteenth-Century Life* (1999) 23, pp. 34–42.

26 Anita Guerrini, 'Introduction, special review section, "The new culinary history"', *Early Science and Medicine* (1999) 4, pp. 164–165.

27 Rachel Laudan, 'A kind of chemistry: the origins of modern French food', *Petits propos culinaires* (1999) 62, pp. 8–22; E.C. Spary and Barbara Orland (eds.), *Food and Medicine 1650–1820*, special issue of *Studies in the History and Philosophy of Biological and Biomedical Sciences* (2013) 43; E.C. Spary, *Eating the Enlightenment: Food and the Sciences in Paris, 1670–1760*, Chicago: The University of Chicago Press,

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Ken Albala has done more than anyone to shape early modern culinary history, and his emphasis on reproducing historical recipes and techniques – on full display on his blog and Facebook page – parallels the work of historians of science such as Pamela Smith in the Making and Knowing project and the Recipes Project of Lisa Smith, Elaine Leong and others.[28] A forthcoming *Osiris* volume on *Critical Histories of Food and the Sciences*, edited by Emma Spary and Anya Zilberstein, shows that food history, in its many manifestations, has officially entered the mainstream of the history of science.[29]

The history of animals has always been part of the history of science as histories of biology and zoology. In these histories, animals are objects rather than actors. But this is changing rapidly. Some of this change owes to the development of animal studies as a field, which has brought animals to scholarly attention, although it continues to be mainly rooted in literary and cultural studies. Although one of the most prominent theorists of animal studies, Donna Haraway, began her career as a historian of biology, I think the relationship between animal studies and the history of science remains unresolved.[30] This is, in my opinion, because of many scholars' continued attention to representation – to texts rather than to practices – as well as its implicit activist stance. Erica Fudge, in her important essay 'A left-handed blow', elegantly deconstructs the different ways humans have written about animals in history. The value of animal history, she asserts, is that it changes how we view ourselves as humans. This is the 'moral work' of animal history, the goal of which is ultimately to change our relationship with animals. I greatly admire this essay, but its funnelling of animal history into modern activism makes me uncomfortable.[31] Writing, as I have done, about the scientific use of animals in the past without explicitly opposing it fits uneasily within animal studies as it is currently practised. One reviewer of *The Courtiers' Anatomists* chastised me for not giving 'critical comment' to my account of animal experimentation in the seventeenth century.[32]

For example, many scholars of animal studies assert that Descartes's 'beast machine' is responsible for modern animal experimentation and indeed modern scientific ideas

2012; Spary, *Feeding France: New Sciences of Food, 1760–1815*, Cambridge: Cambridge University Press, 2014; Elizabeth Williams, 'Sciences of appetite in the Enlightenment, 1750–1800', *Studies in the History and Philosophy of Biological and Biomedical Sciences* (2012) 43, pp. 392–404; Anita Guerrini, 'Health, national character and the English diet in 1700', *Studies in History and Philosophy of Biological and Biomedical Sciences* (2012) 43, pp. 349–356; Guerrini, 'The impossible ideal of moderation: food, drink, and longevity', in Rina Knoeff and James Kennaway (eds.), *The Six Non-naturals: Lifestyle and Medicine before Modernity*, Routledge, in press 2019; Guerrini, 'A natural history of the kitchen', in E.C. Spary and Anya Zilberstein (eds.), *Food Matters: Critical Histories of Food and the Sciences*, *Osiris*, forthcoming 2020.

28 Among Ken Albala's numerous works see *Eating Right in the Renaissance*, Berkeley: University of California Press, 2002; *Cooking in Europe 1250–1650*, Westport, CT: Greenwood, 2006; http://kenalbala.blogspot.com. Pamela Smith, *The Body of the Artisan*, Chicago: The University of Chicago Press, 2004; https://www.makingandknowing.org; Elaine Leong, *Recipes and Everyday Knowledge*, Chicago: The University of Chicago Press, 2018; https://recipes.hypotheses.org.

29 Spary and Zilberstein, op. cit. (27).

30 See most recently Donna Haraway, *Staying with the Trouble*, Durham, NC: Duke University Press, 2016.

31 Erica Fudge, 'A left-handed blow: writing the history of animals', in Nigel Rothfels (ed.), *Representing Animals*, Bloomington: Indiana University Press, 2002, pp. 3–18.

32 James P. Carson, 'Thinking animals', *Eighteenth-Century Studies* (2016) 49, pp. 531–542, 533.

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about animals. Such an assertion misrepresents his philosophy and oversimplifies the complexity of early modern beliefs about animals.[33] There is a kind of teleology that I find quite ahistorical in the idea that people in the past were morally in the wrong and that we know better. I'm not at all arguing that modern moral philosophy surrounding animals is invalid; what I am arguing is that applying it to actions in the past does not advance, and certainly muddles, our historical understanding. My goal as a historian has been to understand people and their actions in the past, not to pass judgement on them from our supposedly superior perspective. Many recent works in animal studies take a more nuanced point of view, and as a discipline it continues to evolve and I continue to learn from its practitioners, even if I sometimes disagree.[34] Environmental historians such as Karl Appuhn and Gregg Mitman, as well as Harriet Ritvo, and many historians of science, have taken up the challenge of writing animal history. Two recent examples from very different perspectives are Juan Pimentel's *The Rhinoceros and the Megatherium* and Erika Milam's *Creatures of Cain*. The recent *BJHS Themes* volume, edited by Amanda Rees, offers a number of new perspectives on animals from historians of science.[35]

Alongside my work as a historian of early modern science, I have had for some time a parallel career as a historian of modern environmental history. Does this make me, in Isaiah Berlin's formulation, a fox rather than a hedgehog? My half-time appointment at UCSB was at first in environmental studies, and later split with history. At the time of my appointment I had published exactly one review essay on an environmental topic, although my bibliography on early American natural history could also be construed as environmental history. Teaching a large (five-hundred-student) introductory class in environmental studies, I quickly of necessity got up to speed on the major issues in the field, and I developed a course on disease and the environment as well. But I did not become an environmental historian until a project fell into my lap in 2002.

At that time, a historic barn on UCSB property had come under threat of demolition. A group of local people sought a historian to research its background and make a case for its preservation. I knew the barn and the area well so I signed on to the project. Three grants, five articles and a pending book project later, I have become deeply engaged in historical ecology, and particularly in the use of historical data to inform decision making in ecological restoration.[36] I've given talks on this topic at meetings of the

33 Guerrini, *The Courtiers' Anatomists*, op. cit. (22), pp. 3–5, 118–127.

34 An excellent survey of recent work is Lucinda Cole, 'Animal studies and the eighteenth century: the nature of the beast', *Literature Compass*, 2019, doi: 10.1111/lic3.12536.

35 Karl Appuhn, 'Ecologies of beef: eighteenth-century epizootics and the environmental history of early modern Europe', *Environmental History* (2010) 15, pp. 268–287; Gregg Mitman, *Reel Nature*, Seattle: University of Washington Press, 1999; Lorraine Daston and Gregg Mitman (eds.), *Thinking with animals*, New York: Columbia University Press, 2005; Juan Pimentel, *The Rhinoceros and the Megatherium*, trans. Peter Mason, Cambridge, MA: Harvard University Press, 2017; Erika Lorraine Milam, *Creatures of Cain: The Hunt for Human Nature in Cold War America*, Princeton, NJ: Princeton University Press, 2019; Amanda Rees (ed.), *Animal Agents*, *BJHS Themes* (2017), 2.

36 Anita Guerrini, 'The trouble with plovers', in Jozef Keulartz, Martin Drenthen and James D. Proctor (eds.), *New Visions of Nature: Complexity and Authenticity*, Cham: Springer, 2009, pp. 75–89; Anita Guerrini and Jenifer E. Dugan, 'Informing ecological restoration in a coastal environment', in Marcus Hall

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Ecological Society of America, the Society for Ecological Restoration and the triennial All-Scientists meetings of the NSF-funded Long Term Ecological Research (LTER) network, as well as at meetings of the History of Science Society and the American Society for Environmental History. After a decade in Oregon, I'm still working on the ecological history of southern California, and I have also done some work with the Andrews Forest LTER site in Oregon. I have found that many ecologists are receptive to historical evidence; the *Frontiers in Ecology* article I co-authored with Eric Higgs and others has been cited well over a hundred times. Sometimes the two sides of my research career merge, as in recent articles on animals in the Anthropocene and on animals and ecological science.[37]

Like many historians, I have taken retirement as a time to write; my new project is on giant fossil bones and early modern nationalism. It is also a time, in the case of this essay, to reflect on my career and the field of the history of science. In comparison to when I entered the field in the 1970s, the history of science has become a wonderfully open and diverse field of inquiry, both in the sense of the topics it considers, and in the sense of its practitioners. There are now many more women historians of science than when I started out, although I think we have some way yet to go in terms of ethnic and class diversity. Although I am optimistic about the intellectual future of the field, I am less optimistic about its future in the academic landscape. Attaining academic positions in the humanities has become vastly more competitive as public universities in particular (in the US and elsewhere) cut academic budgets, add administrators and eliminate 'unnecessary' subjects, including history and foreign languages (at Oregon State University, most languages are only offered online, and few beyond the second year). Because much historical work depends on sources that are in languages other than English, this affects the topics that students can study, and disadvantages public universities over better-funded private ones. This crisis is particularly acute for premodern fields, as modern and anglophone topics are privileged. State funding for public universities continues to contract, so that STEM fields that bring in grant money are very much favoured over the humanities.[38] While historians of science might seem to be more secure

(ed.), *Restoration and History*, New York: Routledge, 2010, pp. 131–142; Eric Higgs, Donald Falk, Anita Guerrini, Marcus Hall, Jim Harris, Richard Hobbs, Stephen Jackson, Jeanine Rhemtulla and William Throop, 'The changing role of history in restoration ecology', *Frontiers in Ecology and the Environment* (2014) 12(9), pp. 499–506; Erin Beller, Loren McClenachan, Andrew Trant, Eric W. Sanderson, Jeanine Rhemtulla, Anita Guerrini, Robin Grossinger and Eric Higgs, 'Toward principles of historical ecology', *American Journal of Botany* (2017) 104(5), pp. 1–4; Anita Guerrini, Donald Burnette and Jenifer E. Dugan, 'Invisible landscapes: perception, heritage, and coastal change in southern California', in Lisa Price and Nemer Marchi (eds.), *Coastal Heritage and Cultural Resilience*, Cham: Springer, 2018, pp. 23–38.

37 Anita Guerrini, 'Deep history, evolutionary history, and animals in the Anthropocene', in Jozef Keulartz and Beatrice Bovenkerk (eds.), *Animal Ethics in the Age of Humans*, Cham: Springer, 2016, pp. 25–37; Guerrini, 'Animals and ecological science', in Linda Kalof (ed.), *The Oxford Handbook of Animal Studies*, New York: Oxford University Press, 2016, pp. 489–505.

38 See, for example, Jordyn Brown, 'State reviewing how it divvies up higher education money', *Register-Guard* (Eugene, Oregon), 25 August 2019, at www.registerguard.com/news/20190825/state-reviewing-how-it-divvies-up-higher-education-money, quoting a state official about differential state funding for STEM majors versus liberal-arts majors: 'Our intent is not to undervalue the liberal arts, but the state has decided

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than others in the humanities, since our target teaching audiences are STEM students, this is a false security if the history departments that most of us inhabit crumble.

New budget models have meant that most PhD programmes admit fewer students than in the past and try to fund all or most of them. This is not in itself a bad thing. The kind of 'weeding' process I experienced at Indiana, when I was the last person left standing in 1983 out of fifteen in my 1978 entering class, was both inefficient and cruel, but when funding for a department depended on numbers of students, it made sense from an administrative point of view to admit lots of students. Now funding for departments does not necessarily depend on 'butts in seats' but on other hazily defined metrics. More serious is a major structural change that has occurred over the past twenty years, as universities shift to contingent labour in the form of adjuncts. This is in part owing to budget woes, but it also has to do with an increasingly popular notion among administrators that a university is a business whose function is to deliver content. This, of course, ignores all the other functions that universities have historically performed, particularly the production of new knowledge and contributing to public discourse. Therefore PhDs today in all humanities fields compete for a diminishing number of tenure-track positions. Few adjunct positions are full-time or offer any kind of benefits or job security, and most of them pay badly. During the fifteen years when I was an adjunct and then half-time on the tenure track, I had a fully employed spouse and subsidized childcare. Not everyone is as fortunate. There is a blossoming genre known as 'quit lit', penned by PhDs who have left the ranks of adjuncts for other professions.[39] Our discipline is in danger of losing a large proportion of the current new generation of scholars.

Historians of science seem particularly well poised to enter 'alt-ac' fields such as museums, and many have, but jobs of these sorts are not abundant and often pay poorly at entry level. A recent article in the *Chronicle of Higher Education* lambasted the American Historical Association for assuming that 'alt-ac' careers could fill the gaping hole caused by the disappearance of traditional academic positions.[40] I do not have a solution to these problems, which are systemic. My retirement may or may not lead to an opening for a tenure-track historian of science in my programme; during my decade at OSU, I have seen more and more adjuncts fill teaching roles, with many of them teaching only online. Although, in our meetings and journals, I see a robust and intellectually challenging field of inquiry, I do fear greatly for our future as an academic discipline.

it wants to generate more STEM graduates because that's what the industry has said it needs', not specifying what industry.

39 Katie Rose Guest Pryal, 'Quit lit is about labor conditions', *Women in Higher Education*, 7 June 2018, at www.wihe.com/article-details/74/quit-lit-is-about-labor-conditions. My thanks to Laura Miller for this reference.

40 Daniel Bessner and Michael Brenes, 'A moral stain on the profession', *Chronicle of Higher Education*, 26 April 2019, at www.chronicle.com/article/a-moral-stain-on-the-profession.

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