



Paul Fayter

Essay Review

On the Lives and Practices of Victorian Scientists: The Case of Joseph Hooker

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IMPERIAL NATURE: Joseph Hooker and the Practices of Victorian Science by Jim Endersby. Chicago, IL: University of Chicago Press, 2008. xii + 429 pages, including 49 halftone illustrations, 1 line drawing, endnotes, bibliography, and index. Paperback; \$35.00. ISBN: 0226207919.

Science, like Christianity, involves the critically reflective interplay of theory and practice. The latter is arguably prior to the former in both domains. And yet, in both scientific and religious matters, the emphasis is usually placed on the former: theories, ideas, doctrines, and dogmas are valued more highly than careful engagement with the material creation (a.k.a. “nature” or “the world”). Orthodoxy trumps orthopraxis. Belief trumps behavior. The end product, whether empirically buttressed theory or theory-laden fact, seems more important than the practical means of getting there.

Surely discipleship—“doing Jesus”—is more important than intellectual assent to a series of propositions about what Christians know and believe. Similarly, the social creation and applica-

tion of natural knowledge and belief—“doing science”—is more important than the production of orthodox bodies of textbook-worthy knowledge.

Of course, I am grossly oversimplifying. In distinguishing between practice and theory, I am perhaps, and incorrectly, implying that it is a question of either/or rather than both/and. The point I wish to make is this: neither faith nor science take place exclusively inside our skulls. Rather, we “do” them by how we live. I am not denigrating theology or theory. But to reduce faith and science to thought is to diminish them both.

How we work out what we believe and think by how we choose to live in the world deserves sustained scholarly attention. This means attention to details discerned in contingent contexts, details not only about the ideas but the actions of particular people located in wider communities and affected by larger cultural currents. Beliefs are embodied in behaviors; the social is expressed in the biographical. The practice of scientific, no less than spiritual disciplines, requires work. Hard work. While this work is done by individuals, rarely is it done in perfect isolation.

For the past three decades, **Paul Fayter** has combined pastoral ministry with academic research and teaching, the latter at the University of Toronto and York University. He was ordained in the United Church of Canada (a historic union of Methodist, Presbyterian, Congregational, and Evangelical United Brethren churches). His teaching has focused on Darwin and Darwinism, history of astronomy and physics, apocalyptic thought, and science, theology, and science fiction. His doctoral work combined theology, ethics, and history of evolutionary biology. He has published extensively in the areas of liturgy, preaching, history of Victorian science and so forth. He is currently working on a PhD thesis on Thomas Huxley and evolutionary ethics at the Institute for the History and Philosophy of Science and Technology. Paul has been a member of the CSCA since 1977.

And such work involves not only ideas and beliefs, but *things*. In science, these include specimens and museums; in Christianity, such things include fellow creatures, and water, bread, and wine.

At last, we have a first-rate scientific biography of Joseph Dalton Hooker (1817–1911): if not quite a singular, then certainly an aspiring, successful, and significant Victorian gentleman of science. While he lived on the periphery of the Church of England, Hooker worked at the center of imperial British science. For such a key figure—and member of Darwin’s inner circle—Hooker has received relatively little attention. This has begun to change.

Once, biographies were the Rodney Dangerfields of the historiography of science (and the historiography of “science and religion,” for that matter): they could not get much respect. There were reasons for this judgment; too often such books were poorly researched and written, or too “popular” or hagiographic, or simply juvenile, whether by accident or design. There were fine exceptions, of course. And even bad biography had its benefits; forty years ago, I was launched on a lifetime trajectory after reading, in a public library, a kid-friendly story of Newton’s life, work, and thought. But, while simple-minded and even mediocre biographies will no doubt continue to appear, it is no longer the case that biographies of scientists seem like second-rate examples of the historian’s craft. Some, like the book under review, are exceptionally well done and—by combining close attention to the fine-grained details of individual lives and practices in their social contexts, with analyses of big ideas and movements, along with insightful portraits of entire ages—continue to redefine the nature of “biography.”

Science, we have known for a long time now, is much more than ideas in people’s heads. We sometimes forget this, given our gender-biased and over-intellectualized assumptions about science past and present. New generations of historians have, for instance, placed into the foreground the role of scientific “practices”—including the rigors of field work, the formation and nurturing of social networks, the crafting and employment of “scientific” instruments and other artifacts, the creation of laboratory protocols, the proper drawing of inferences from experiments, the recognition of culturally embedded and theory-laden natural facts, the demands of personal, national, and institutional

politics to name a few—among other details concerning the acquisition, construction, legitimization, publication, distribution, translation, and transformation of natural knowledge.

Consider, for a moment, the class of subjects that Jim Endersby’s *Joseph Hooker* fits into: nineteenth-century, English-speaking naturalists whose lives and works illuminate not only nature but the changing natures, practices, and contexts of knowledge; not only nature but concepts of “creation” and evolutionary history; and not only nature but the blurry boundaries between “amateur” and “professional,” science and belief, interests and ideas.

Readers of this journal should be aware of the important book-length biographical studies from the past two decades or so that illuminate the above-mentioned category of (mostly) men of Victorian science. An incomplete list includes, in chronological order of publication,

- David B. Wilson, *Kelvin and Stokes: A Comparative Study in Victorian Physics* (Adam Hilger, 1987);
- Pietro Corsi, *Science and Religion: Baden Powell and the Anglican Debate, 1800–1890* (Cambridge University Press, 1988);
- Menachem Fisch and Simon Schaffer, eds., *William Whewell: A Composite Portrait* (Oxford University Press, 1991);
- Geoffrey Cantor, *Michael Faraday: Sandemanian and Scientist* (St. Martin’s Press, 1991);
- Adrian Desmond and James Moore, *Darwin: The Life of a Tormented Evolutionist* (Michael Joseph, 1991);
- Adrian Desmond, *Huxley: The Devil’s Disciple* (Michael Joseph, 1994);
- Nicolaas Rupke, *Richard Owen: Victorian Naturalist* (Yale University Press, 1994);
- Janet Browne, *Charles Darwin: Voyaging* (Alfred Knopf, 1995);
- Joseph Lester, *E. Ray Lankester and the Making of Modern British Biology*, ed. Peter J. Bowler (British Society for the History of Science, 1995);
- Michael Shortland, ed., *Hugh Miller and the Controversies of Victorian Science* (Oxford University Press, 1996);
- Colin A. Russell, *Edward Frankland: Chemistry, Controversy and Conspiracy in Victorian England* (Cambridge University Press, 1996);
- Adrian Desmond, *Huxley: Evolution’s High Priest* (Michael Joseph, 1997);

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- William J. Astore, *Observing God: Thomas Dick, Evangelicalism, and Popular Science in Victorian Britain and America* (Ashgate, 2001);
- Nicholas Wright Gillham, *A Life of Sir Francis Galton* (Oxford University Press, 2001);
- Janet Browne, *Charles Darwin: The Power of Place* (Alfred Knopf, 2002);
- Paul White, *Thomas Huxley* (Cambridge University Press, 2003);
- Rebecca Stott, *Darwin and the Barnacle* (Faber and Faber, 2003);
- Frank N. Egerton, *Hewett Cottrell Watson: Victorian Plant Ecologist and Evolutionist* (Ashgate, 2003);
- Ross A. Sloten, *The Heretic in Darwin's Court: The Life of Alfred Russel Wallace* (Columbia University Press, 2004);
- Martin Fichman, *An Elusive Victorian: The Evolution of Alfred Russel Wallace* (University of Chicago Press, 2004);
- Theodore M. Porter, *Karl Pearson: The Scientific Life in a Statistical Age* (Princeton University Press, 2004);
- Peter Morton, *"The Busiest Man in England": Grant Allen and the Writing Trade, 1875–1900* (Palgrave Macmillan, 2005);
- Sandra Herbert, *Charles Darwin, Geologist* (Cornell University Press, 2005);
- Mark Francis, *Herbert Spencer and the Invention of Modern Life* (Cornell University Press, 2007);
- Linda Lear, *Beatrix Potter: A Life in Nature* (Allen Lane, 2007);
- Michael Taylor, *The Philosophy of Herbert Spencer* (Continuum, 2007);
- Mark Patton, *Science, Politics and Business in the Work of Sir John Lubbock* (Ashgate, 2007);
- Ralph Colp Jr., *Darwin's Illness* (University Press of Florida, 2008);
- Charles H. Smith and George Beccaloni, eds., *Natural Selection and Beyond: The Intellectual Legacy of Alfred Russel Wallace* (Oxford University Press, 2008); and
- Adrian Desmond and James Moore, *Darwin's Sacred Cause: Race, Slavery and the Quest for Human Origins* (Allen Lane, 2009).

Special mention should also be made of James Secord's *Victorian Sensation* (University of Chicago Press, 2000), the exhaustive and revealing "biography" of an anonymously written and sensationally

received pre-*Origin* book on evolution; Robert Chambers's notorious *Vestiges of the Natural History of Creation* (University of Chicago Press, 1994); and Bernard Lightman's *Victorian Popularizers of Science* (University of Chicago Press, 2007), an equally monumental and groundbreaking study that reconfigures the cultural landscape of post-Darwinian science: its authority, its audience, its relations with religion and morality, and its popularization in mass-produced books written and illustrated by dozens of forgotten women and men, most of whom, *contra* Darwin's bulldog Thomas Henry Huxley, persisted in seeing nature as designed, purposeful, good, beautiful, and the theater of God's glory. We can additionally look forward to the publication, in a few years, of major studies of John Tyndall (by Bernie Lightman) and Alfred Russel Wallace (by Jim Moore).

Further, as the title *Imperial Nature* signals, Endersby has situated his study of Hooker in the specific historiography of botany in the context of empire. He builds on such work as Richard Drayton's PhD thesis, "Imperial Science and a Scientific Empire: Kew Gardens and the Uses of Nature, 1772–1903" (Yale University, 1993); David Miller and Peter Reill, eds., *Visions of Empire: Voyages, Botany, and Representations of Nature* (Cambridge University Press, 1996); and Donal McCracken's *Gardens of Empire: Botanical Institutions of the Victorian British Empire* (Leicester University Press, 1997). Incidentally, those whose schedules or interests might preclude the reading of a whole book on Hooker are encouraged to read Endersby's 2004 article on him in the *Oxford Dictionary of National Biography*, easily available in libraries or online for subscribers at www.oxforddnb.com/view/article/33970.

The grand themes of Victorian science include professionalization, imperialism, and the implications of the sciences, especially of Darwinism, on religious belief. Newer historiography has been dealing with the fine points of scientific practice, knowledge, publication, and reception. Gentlemen of science in important cities, including London, the imperial metropolis, depended not only on field work and libraries but also on networks of correspondents and collectors (including seamen, breeders, and missionaries) who gathered botanical and zoological specimens and transported them from colonial peripheries to imperial centers. Endersby

focuses on Hooker not only because his life (intrinsically interesting) and work (important) have been under-examined — and thoroughly overshadowed by Darwin's — but because the grand themes were central to his story. With Hooker as his frame, Endersby revises our understanding of those themes.

The professionalization of Victorian sciences, for instance, has been interpreted (most notably by Frank Turner) as, among other things, the attempt by scientists to wrest cultural authority from the Church of England. Francis Galton, the father of eugenics, famously called for a new “scientific priesthood” who would establish naturalism, not Christian theism, as foundational for late nineteenth-century society. The “professed” or “professional” scientist, Endersby grants, had “quasi-religious” or moral and vocational connotations. But the historical narrative of professionalization, he argues, can be challenged on the grounds that the term itself is not unambiguous, stable, or universally shared; and further, the process looks suspiciously teleological. One of the strengths of Endersby's account of Hooker's botany is its highlighting of some of the complex, and anything but disinterested, negotiations involved in claims for elevating scientific work from “mere occupation” to “respected profession” (pp. 23–7).

Readers of this journal will be most familiar with Hooker as one of Darwin's inner circle of trusted friends. Hooker was the one to whom Darwin wrote (famously, in a letter of 11 January 1844) that “I am almost convinced (quite contrary to opinion I started with) that species are not (it is like confessing a murder) immutable.” As Hooker later admitted to Francis Darwin, in notes published in volume two of the latter's *Life and Letters of Charles Darwin*, he slept in 1839 with proof sheets of Darwin's *Journal of Researches* under his pillow (acquired via his father, an old friend of the geologist Charles Lyell). Hooker's were the only outside eyes allowed to read the longhand draft of what would become *The Origin*, the “Essay of 1844.” It was Hooker, along with Lyell, who helped a gobsmacked Darwin preserve his scientific priority over the discovery of natural selection, after Darwin received on the morning of 18 June 1858 a package from Wallace in the Dutch East Indies containing a paper describing the same natural explanation for speciation upon which Darwin had for so long been laboring. Hooker, although not without some doubts and disagree-

ments, especially biogeographical, became one of the earliest advocates of Darwinism. Hooker's “Introductory Essay” to his *Flora Tasmaniae* (1860; the introduction was written early in November 1859) was one of the first published endorsements of Darwin's theory, albeit with a few qualifications. And it was Hooker who spoke after Huxley and Bishop Samuel Wilberforce at the infamous 1860 Oxford “debate.” These are all well-known stories, and Endersby virtually ignores them all.

There is method in such omissions, however. Endersby is trying to avoid such popular but “wrong” questions as “when did Hooker become a Darwinian?” and “was his support for Darwinism really ambiguous?” He steers the reader away from the pop myth of a “Darwinian Revolution” that instantly made believers of a new generation of younger naturalists. In his concluding chapter, Endersby writes: “The more important question, I would suggest, is ‘what made natural selection useful to Hooker?’ — not least because this question reminds us that the practices and debates that shaped Hooker also shaped Darwin” (p. 320).

There is very brief mention of Hooker's religious views; he seems to have been a public liberal Anglican and a private agnostic, although not as subversive as his friend Huxley (p. 267). In his 1868 *Presidential Address to the British Association for the Advancement of Science*, Hooker saw religion and science both as routes to truth, able to “work in harmony” as long as the “delusion” of “Natural Theology; a science, falsely so called” was avoided (quoted p. 282).

Hooker earned his MD at Glasgow University where his father William was professor of botany. As so many of his peers did, he embarked on a scientific voyage. As assistant surgeon on HMS *Erebus* (accompanied by HMS *Terror*), Hooker spent the years 1839 to 1843 exploring the Antarctic, New Zealand, Tasmania, and the southern seas, collecting plants by the thousands. Upon his return to England, he began preparing his botanical notes for publication (in six large volumes, 1844–1860), he was befriended by Darwin, and he began searching for a salaried position. With the financial support of the British government and of his father (who became the first Director of the Royal Botanic Gardens [RBG], Kew), Hooker was able to mount expeditions to the Himalayas and Bengal. Returning

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in 1851, he was duly appointed deputy to his father at the RBG; when his father died in 1865, Hooker succeeded him as Director at Kew, and so served there until his retirement in 1885. Throughout his career, he continued traveling and publishing and received numerous honors and awards, including being elected President of the Royal Society.

As Endersby writes in his Introduction, Hooker's career "helped define the key issues concerning the status of nineteenth-century science." That is, he was close to Darwin, and "one of his first and most ardent supporters" (p. 5); his work as a world-renowned botanist focused on some of the Empire's vital "natural resources"; he helped create the role of "the modern scientist" who, at a time when prostitution was called a "profession," showed that a paid scientist could also be a respected gentleman, accepted by those whose privileged social status the new scientists hoped also to acquire.

Biography is the domain of the contingent. There was "nothing inevitable" (p. 5) about the paths and changes Hooker followed and helped make. Endersby argues that "there was nothing predictable about Hooker's embrace of Darwinism, which was supposedly the common, secularizing ideology of the scientific professionalizers" (p. 6). Hooker's embrace of Darwinian evolution was, Endersby contends, both more "complex and ambiguous" and less "wholehearted" than previously recognized. His problems with selection theory were not "primarily" religious or political, but arose from the day-to-day "practical difficulties of earning a living from science" (p. 6).

Without neglecting scientific ideas, which he superbly situates in their personal, social, political, and institutional contexts, Endersby constructs a portrait of Victorian science *as actually practiced by particular people in particular places*, emphasizing the work of discovering, collecting, preserving, storing, and classifying botanical specimens. Endersby connects letters, journals, diaries, and notebooks, not only to finished publications, but also to other material artifacts such as herbarium sheets (dried plant specimens identified and attached to sheets of special paper, filed in floor-to-ceiling wooden cabinets), botanical drawings, and microscopes. Endersby also introduces the questions that Hooker would wrestle with as he sought to understand the relationship between the physical geography of a place—climate,

soils, and so on—and its characteristic vegetation. Hooker wanted to reach beyond description to analysis and explanation: By what natural laws did similar but distinct species succeed one another through time or across space? How and why did species originate and vary? Were there multiple "centres of creation"? How narrowly or widely ought species to be defined? What mathematical tools could be brought to bear in the classification and distribution of plants? "Botanical arithmetic," for instance, made for what Hooker called a "more complete & philosophical" discipline, offering greater precision (as in the physical sciences), which would confer greater authority and prestige to its practitioners.

The tale proceeds both chronologically and thematically. Chapter 1, "Traveling," begins in the summer of 1839 with Hooker accidentally encountering Charles Darwin while walking in London with Robert McCormick, who had served with Darwin aboard HMS *Beagle*, and who would be the naturalist on the *Erebus*. In chapter 2, "Collecting," Endersby discusses a Victorian passion that involved far more than plucking plants. Collecting required knowledge: to find the right plants, to anatomize and label parts correctly, and to properly preserve, mount, pack, and transport specimens from colonial outposts to the imperial metropolis. "Corresponding," the third chapter, is a fine addition to the ongoing historical explication of Victorian networks of scientific letter-writing and friendship.

Chapter 4, "Seeing," involves not only seeing with the unaided but educated eye, but also *illustrating* what was observed (sometimes assisted by various instruments), then drawn, painted, or lithographed. This aspect of the naturalist's practice was not only a popular pastime, but also part of scientific training and the commercial publication of what was seen; strangely, photography is not discussed. The Adamic power of naming specimens and species was one means of exerting metropolitan control over colonial collectors. This was a major topic of ongoing discussion between Hooker and Darwin, as Endersby shows in chapter 5, "Classifying."

"Settling," the title of chapter 6, is used in at least two senses: "settling down" after international travel, to secure a salaried position that allowed Hooker to support his wife and family, and the process of authoritatively "settling" disputes, for

example, between competing systems of classification. Chapter 7, "Publishing," refers to manuals, magazines, handbooks, textbooks, monographs, encyclopedia, and journal articles. Knowledge was written up in various ways for various readers: scientific peers, students, gardeners, and naturalists of all kinds, including amateur ladies and gentlemen. To get into print was to deliberately help to create a new imperial discipline, to enhance personal credibility, and to control an emerging standard nomenclature, among other things.

Chapter 8, "Charting," deals with counting, classifying, and mapping the geographical distribution and migration of species. Certain plants—e.g., the cinchona tree (from the bark of which quinine was made), tea, rubber, and cocoa—had great economic value. Their indigenous management, as well as attempts to transplant them to the UK, reflected botany's imperial character and context. Chapter 9, "Associating," explores the "gentlemanly" and "philosophical" pursuit of natural knowledge. The cut and thrust of scientific debate hinged not only on matters of fact and feeling, but of class, trustworthiness, courtesy, character, and respectability. Uncovering and constructing the origin, definition, and distribution of species was truly social, and not merely intellectual work. Chapter 10, "Governing," is a nice essay on the politics of science. Despite its early private and family roots, the government ownership and funding of Kew Gardens necessarily implicated Hooker in questions of accountability, competition, power, and personality conflict. Kew Gardens was a hybrid institution, both public and private: a center for tasteful education, for healthy recreation, as well as for elite scientific research with global commercial significance. The potential for tension is obvious. The details of how Hooker managed his botanical empire, while building his career, protecting his status, and defending his authority, make for a compelling story.

Endersby begins his "Conclusion" in 1901, when an eighty-four-year-old Sir Joseph Hooker opens a new botanical laboratory in the presence of young white-coated professional scientists who must have regarded the old man as a kind of living fossil. Some of the younger men perhaps understood that Hooker had not only lived through a profound transformation of the sciences, but that he had done much to create it. Professionalization was

certainly one part of the great change; Darwinism and "the species question" were others. In his intelligent discussion of Hooker's complex relationship to Darwinism (pp. 316–27), Endersby avoids what he calls the "mythological" errors: (1) that "everything changed" in 1859, and (2) that the big question, or the most important problem for Victorian biologists, concerning species was whether they had evolved. When, exactly, did Hooker first "convert" is—however natural—to ask the wrong question. *Imperial Nature* convincingly asks and answers the more interesting and less mythological question of *how Hooker variously and tactically used natural selection* in different contexts and for different audiences.

[An aside: Endersby asserts that Hooker "was the first man of science to defend natural selection in print" (p. 5). This is true after *The Origin* appeared in November 1859. But, as various scholars have noted, Henry Baker Tristram's "On the Ornithology of Northern Africa. Part III. The Sahara Continued," in *The Ibis*, 1 (October 1859): 415–35, positively applied natural selection theory to the coloration and anatomy of certain lark species (pp. 429–31), using the Darwin-Wallace papers presented to the Linnean Society on 1 July 1858 and published in the *Proceedings* on 20 August 1858.]

The overarching argument of *Imperial Nature* is of far-reaching significance for the history of science: to examine Hooker's ideas without a thorough examination of his travels, field work, instruments, artifacts, and material practices, including collecting and classifying, is "to stand him on his head" (p. 312). Endersby has presented Hooker brilliantly and, if not in full, then at least right side up. *

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