

A Life More Ordinary: The Dull Life but Interesting Times of Joseph Dalton Hooker

JIM ENDERSBY

Department of History

University of Sussex

Brighton, BN1 9SH,

UK

E-mail: j.j.endersby@sussex.ac.uk

Abstract. The life of Joseph Dalton Hooker (1817–1911) provides an invaluable lens through which to view mid-Victorian science. A biographical approach makes it clear that some well-established narratives about this period need revising. For example, Hooker’s career cannot be considered an example of the professionalisation of the sciences, given the doubtful respectability of being paid to do science and his reliance on unpaid collectors with pretensions to equal scientific and/or social status. Nor was Hooker’s response to Darwin’s theories either straightforward or contradictory; it only makes sense as carefully crafted equivocation when seen in the context of his life and career. However, the importance of Hooker’s life is ultimately its typicality; what was true of Hooker was true of many other Victorian men of science.

Keywords: biography, history of science, Joseph Dalton Hooker, Charles Darwin, scientific imperialism, professionalisation

When I first decided to work on Joseph Dalton Hooker (1817–1911), I hoped to discover that he was extraordinary. But he wasn’t. In the course of a decade of research, I have discovered that Hooker was a rather run-of-the-mill, Victorian botanist. As he said of himself, “Botany has been dull work to me, little pay; no quarrels; an utter disbelief in the stability of my own genera and species; no startling discoveries; no grand principles evolved” J.D. Hooker to Bentham, 7/1855: (Hooker 1842–).¹ However, my initial disappointment has long since dissipated: Hooker’s ordinariness has proved to be the most interesting thing about him, since he exemplified much that was typical of his contemporaries. Understanding him and his work has changed the way I view both science and its history.

¹ Part of this letter is quoted in Huxley, 1918.

I first discovered Hooker, half-hidden in Charles Darwin's shadow, while reading James Moore and Adrian Desmond's superb biography of Darwin, which appeared while I was an undergraduate, studying history and philosophy of science at the University of New South Wales (UNSW) (Desmond and Moore, 1991). Desmond and Moore described Hooker as Darwin's "sounding board" and emphasised the close relationship the more famous naturalist formed with his younger, relatively obscure colleague.

I had been led to university by Stephen Jay Gould's essays, which gave me a lasting fascination with the history of all things evolutionary and at UNSW I was lucky enough to take David Oldroyd's course "The Darwinian Revolution" (especially lucky since it was the last time he taught it before retiring). By the time I was studying, the Darwin industry was well-developed and I was intrigued to discover the range of material that had already appeared, especially the published notebooks and correspondence, which gave such a vivid sense of peeking into Darwin's mind as his ideas took shape. Yet, the very richness of the Darwin industry's productions deterred me from working on Darwin; I felt I had little chance of making a contribution to a field where so many grand scholars were already hard at work. While looking for an alternative PhD project, I noticed something interesting: Desmond and Moore's biography placed considerable emphasis on a now-famous letter Darwin wrote in 1844 in which he compared revealing his belief that species were "not immutable" to "confessing a murder" (C. Darwin to J.D. Hooker [11 Jan 1844]: Burkhardt and Smith, 1987, p. 2). What caught my attention about this letter was its recipient (I was the kind of student, utterly maddening to my fellow undergraduates, who not only read footnotes, but followed them up and read the sources they referred to). Darwin's "murder" letter was sent to Hooker, who was then a virtually unknown young botanist, just returned from a long voyage around the Antarctic. Hooker had yet to publish anything, he and Darwin had only exchanged a couple of letters and had met just once, very briefly, several years earlier. And yet, I thought, here was Darwin trusting this young man with the biggest of all big secrets.

As I pieced these facts together, I assumed that there must have been something quite extraordinary about Hooker to justify Darwin's faith. I hurried to the library to read a recent scholarly biography of Hooker – and found that there wasn't one. Nothing had been written about him in almost 40 years.² The existing literature shed no light on the great ideas

² At the time, only three biographical works on Hooker had appeared: Huxley, 1918; Turrill, 1963; and Allan, 1967. There was also a collection of extracts from his major publications (Turrill, 1953).

about species and their evolution that Hooker must secretly have formulated; there must, I naively assumed, have been at least hints of such ideas for Darwin to have placed such confidence in his young correspondent. My suspicion was, I thought, confirmed when I did a little more work and discovered that Hooker had been the first man of science to publicly defend Darwin's ideas, once they became public (Young, 1992; Porter, 1993). His decision to take a public stance in support of such a controversial theory helped convince me that I had found a PhD topic that, with a bit of luck, would eventually turn into a scholarly biography like Desmond and Moore's.

Soon after arriving in Cambridge to start work on my projected biography, I discovered two things that made me change my mind. The first was the size of the Hooker archive: at the Royal Botanic Gardens, Kew there were dozens of volumes of personal correspondence alone, supplemented by many more of official letters; there were more than a thousand letters to and from Darwin, held at the Cambridge University Library; more letters elsewhere; plus, a vast number of published scientific papers and books. There was simply too much for a 3-year PhD; I would need to start with some more manageable aspect of Hooker.

I made my second discovery when I started to read the correspondence. Not only was Hooker never to be found "confessing a murder" or doing anything equally interesting, most of his letters consisted of material like this:

Float the delicate seaweeds separately in a plate of fresh water, place a piece of writing paper of fit size underneath the specimen in the water, spread out the branches and leaves with a pin or other pointed instrument, then by tilting the plate or raising the paper draw out the paper with the seaweed spread out on it, and dry it paper and weed as other plants[,] ticket it on paper before putting away dried. *Search for fruit of both kinds.* Large coarse olive-colored seaweeds may be dried as common plants, but care must be taken not to soak them in fresh water, which cause them to melt into a foam. The Chinese Seas are supposed to abound in unknown seaweeds of the Genus *Sargassum* and its alies [*sic*] which may be dried as common plants (Instructions to Charles Wilford from JD Hooker, KCL/13/1).

And much, much more in the same vein. Endless pages of information about how to dry seaweeds, to draw plants, make notes, pack boxes, bottle fungi and press flowers. This was not the kind of material that made for a best-selling biography.

Nevertheless, with much help from my supervisor Jim Secord, I gradually realised that this material, far from being dull, was actually fascinating. It threw light on a simple but often unanswerable question: what do people actually do when they're doing science? I gradually realised that Hooker was the ideal subject through which to pursue this question: he was famous enough for there to be a substantial archive, but not so extraordinary that his life and career were utterly unlike those of his contemporaries. He was exactly the right tool for the job of investigating scientific practice; so I changed the job to suit the tool that came to hand. However, the full historiographical importance of seaweed-drying instructions only became clear in the context of Hooker's career and I found that a broadly biographical approach was the best way to understand how his career took shape and what it might tell us about the world of Victorian science. By 'broadly biographical', I mean a chronological study of aspects of an individual's life and work as opposed to, for example, a broad study of several dozen naturalists and institutions across the mid-Victorian period. The latter would, no doubt, also have yielded fascinating insights, but rather different ones to those I hope to offer. Yet, despite my focus on Hooker, I would argue that what I have written cannot be considered a full-blown biography, since I have deliberately paid little or no attention to many aspects of Hooker's life; his marriages and children, religious and political beliefs, relationships with his parents and much else have been ignored, since I felt they were not essential to the question of how a scientific career was constructed.

Hooker was a member of the X-Club (f. 1864), an informal coterie of young men of science who exerted considerable influence within the world of late-Victorian science. He was an important defender of Darwin and his work, as were his fellow X-Clubbers, John Tyndall and Thomas Huxley, and like them is often regarded as a "professionaliser" of science, one of those who united under Darwin's banner to drive the Anglican hierarchy and their clients from the scientific world. Hooker's importance to Darwin, as a friend, supporter and endless source of both facts and criticisms, initially conforms to a well-established view of mid-Victorian science and confirms Hooker's central place within it. Thanks in part to the X-Club's support, Hooker would become one of the most powerful and influential figures in Victorian science, not just director of Kew when its influence was at its height, but president of the Royal Society and a leader of the British Association for the Advancement of Science. He was knighted for his services to empire and received both

honorary degrees and fellowships of scientific societies from all over the world.

This conventional perspective has been largely shaped by Darwin's biography: for example, the X-Club became a focus of historical interest precisely because of their prominent support for Darwinism. From this Darwin-centric perspective, Hooker's ascent appears almost inevitable, not least because it reinforces a number of assumptions historians often make about the period. Among these is the idea that the professionalization of science was a common goal that the younger men of science consciously pursued. Since science did in fact become a recognised profession by the end of the nineteenth century, the triumph of its *de facto* ideology, Darwinism, seems equally predictable.³ Moreover, the use men like Hooker were able to make of the empire's resources and opportunities, reinforces our sense that Victorian science was largely created in the metropolis and then disseminated to the colonies.⁴ However, placing Hooker's life, work and interests at the heart of my research has led me to question all three of these assumptions – about professionalisation, the reception of Darwinism, and the nature of imperial science.

Like many Victorian naturalists, Hooker has been reduced to little more than a footnote to Darwin studies; in order to make Hooker's life and career the main object of my study, I found that I had to push Darwin into the background (temporarily at least) and when I did so, the grand narratives of Victorian science that I'd been raised on looked very different. A focus on the nitty-gritty of daily scientific life forced me to think, for example, about exactly how someone like Hooker made a living, shaped a career and gained his power: exactly how did he make and use his imperial connections, and what precisely was his reaction to Darwin's ideas. Hooker's later fame obscures the fact that the first 35 years of his life were a struggle to find suitable paid employment and establish his reputation. Far from being a predictable rise to power, a biographical study of Hooker's career reveals it to have been a series of improvisations made in response to a set of specific historical contingencies, many of which hindered his ambitions. I will argue that a broadly biographical focus leads to an emphasis on scientific practice, and that such a practice-based account challenges key aspects of a historiography that, despite important critiques made in recent years, remains pervasive.

³ For a more detailed critique of the conventional historiography of professionalisation, see Morrell, 1996; Barton, 1998, 2003; Desmond, 2001; Bellon, 2001.

⁴ Recent criticisms of this vision of imperial science, include MacLeod, 1987; Baber, 1996; Miller and Reill, 1996; Drayton, 1999, 2000; Raj, 2000; Sivasundaram, 2010.

Born to the Purple?

Joseph Hooker's first biographer described him as having been "born in the purple, for in the realm of botany his father, Sir William Hooker, was one of the chief princes" (Huxley, 1918, p. 3). At first sight, this claim looks plausible, since Hooker's father, William Jackson Hooker (1785–1865), was Regius Professor of Botany at the university of Glasgow, and counted among his friends and patrons such men as Sir Joseph Banks and Sir James E. Smith, one of the founders of the Linnean Society of London (Allan, 1967; Drayton, 2000). However, these facts obscure other, rather significant, ones. For example, William Hooker had sold the little land he had inherited to invest in his father-in-law's brewery. Income from industry was less solidly respectable than income from rents; one way in which he preserved his genteel dignity was that he did not work in the brewery himself. By contrast, the transition from brewery owner to university professor was one from proprietor to employee, a step *down* the social scale.⁵ A professor had to work for his (rather meagre) living, something which – by definition – gentlemen did not do; men like Hooker would stand at the door of their lecture theatres and take money from their students as they filed in (a practice that may well become a feature of all our lives as universities are transformed into profit-driven businesses). A botanical professor's status was further compromised by the fact that his income relied on teaching medical students; medicine was the least prestigious of the learned professions, and those who attended botany lectures were mainly destined to become apothecaries – the lowest of the low because they engaged directly in trade.

The close associations between botany and medicine were a key reason for its low scientific status; it was regarded either as a dull matter of drying and naming plants for limited practical purposes, or as a respectable but undemanding pastime for ladies and children. So although William Hooker made a scientific name for himself, it was in a low-status branch of science and his son's legacy would be mostly books and specimens, rather than money.

Joseph attended his father's botanical lectures and field trips from the age of seven. He would later make much of his early passion for studying plants, describing himself as a born botanist, an assessment his

⁵ He received a small salary from the university, but relied on students' lecture attendance fees. Even Oxbridge professorships were much less well-remunerated than most of the clerical livings in the gift of the colleges, so fellows tended to wait for the latter (Heyck, 1982).

biographers have tended to take at face value, thus reinforcing the sense of inevitability that has often pervaded accounts of his life. However, it is important to remember that, whether or not Joseph loved botany, he and his father knew he would need to earn his own living, preferably in a career that allowed his father's influential friends to assist him. With these goals in mind, Joseph received a medical degree at Glasgow University and then trained as a naval surgeon. In 1839, just a year after he qualified, William Hooker's contacts helped Joseph secure an appointment as assistant surgeon aboard HMS *Erebus*, a naval surveying vessel that was about to set off on one of the period's most important scientific expeditions, the Magnetic Crusade.

Accompanied by its sister ship the *Terror* and commanded by James Clark Ross, the *Erebus* spent 4 years exploring Antarctic waters, surveying variations in the earth's magnetic field (Cawood, 1979). Hooker was acknowledged by Ross to be the expedition's botanist and whenever the ships retreated north of the Antarctic circle for repairs and resupplying (as they regularly had to do), Hooker was given every opportunity to go ashore, collecting plants and making contact with those of his father's correspondents who lived in places such as New Zealand and Van Diemen's Land (Tasmania). Hooker formed lifelong friendships with several of these colonial botanists, friendships that would later prove immensely valuable after his return to Britain.

In addition to contacts and collections, Joseph acquired another valuable career-building asset while at sea: in 1841, William Hooker was appointed the first director of the royal gardens at Kew, the running of which had just been assumed by the government. Hooker senior was expected to transform the gardens from a rather haphazardly run royal pleasure garden into a national botanic garden to rival Paris's *Jardin des plantes*, thus finally fulfilling Banks' vision of Kew as "a great botanical exchange house for the empire" (Brockway, 2002).

In 1843, Joseph Hooker wrote to his father from the *Erebus*, discussing his future career prospects. At his time he was considering remaining in the navy so that, with Ross's support, he could persuade the Admiralty to put him on half-pay ashore while he wrote up his collections – an increasingly common form of subsidy for shipboard naturalists. As Hooker wrote, "I am not independent, and must not be too proud; if I cannot be a naturalist with a fortune, I must not be too vain to take honourable compensation for my trouble" JD Hooker to WJ Hooker, 18 May 1843: (Huxley, 1918, p. 166). This letter is a useful reminder not to assume that professional status was seen as desirable in the first half of the century, not least because the profession botany was

usually associated with was medicine; Hooker would clearly have preferred being “a naturalist with a fortune,” had he been able to.

After the Ross expedition returned to Britain, Hooker began work on his first major publication, *The botany of the Antarctic voyage of HM discovery ships Erebus and Terror in the years 1839–1843*. The first volume, the *Flora Antarctica*, appeared in serial form between 1844 and 1847, and was a fairly typical representative of an increasingly familiar genre: a brief description of the voyage accompanied by a catalogue of the plants collected. However, later volumes (*Flora Novae-Zelandiae*, 1851–1853 and *Flora Tasmaniae*, 1853–1860) were more ambitious and this growing ambition only makes sense when viewed in the context of Hooker’s life and the difficulties he faced in earning a living.

Hooker expanded his collections using his father’s library, collections and contacts to produce a massive comparative flora of the Southern oceans. His goal was to go beyond simply listing species by mapping the global distribution of vegetation. Hooker’s project mirrored that of the Ross expedition itself, mapping terrestrial magnetism, and it had echoes in the various geological surveys getting underway around the world. These large-scale mapping exercises served two, inseparable purposes. Firstly, they were catalogues of imperial resources. Britain’s trade was dominated by plant-based products, from tea and opium to timber, spices, dyes and medicinal plants; it was vital to know what grew where and how it might successfully be transplanted to areas under British control. There was a close parallel to the geological maps being produced at the Geological Survey (where Hooker himself would later work). The Survey’s employees were the first British men of science to be paid by the government, largely because geological maps served the highly practical purpose of improving access to the mineral resources upon which Britain’s continuing industrialisation depended. Meanwhile, the gentlemen of the Geological Society were also busy; these elite geologists were utilising work like that being done by the Survey to formulate complex speculations about the Earth’s history and thus about the scientific laws that had shaped it. As a result, they were elevating their science from a purely descriptive study into a properly philosophical discipline (Rudwick, 1972 (1985); Rudwick, 1985; Secord, 1986, 1997). Geology’s ability to serve both practical and intellectual goals had raised its status in a way that provided a model for botanists; men like Hooker hoped to overcome the low status of their own science by serving empire’s needs and discovering the laws that governed the distribution of plants.

Thinking biographically provides constant reminders of Hooker's attempts to gain "honourable compensation for my trouble," and thus of the unavoidable entanglement of practical and theoretical goals (indeed, they were indistinguishable in many regards). One reason the *Botany of the Antarctic Voyage* took a decade and a half to complete (1844–1860), was that Hooker constantly interrupted his work on it to continue his search for paid employment. After failing to get the Edinburgh University chair of botany, he worked for the Geological Survey (1846–1847), and then deferred marriage in order to make a second long trip, this time to India (1847–1851) (Bellon, 2005). On his return, he failed to get the East India Company to support a projected *Flora Indica* (the first volume was privately published in 1855). He was finally appointed deputy director of Kew in 1855 and would eventually succeed his father as director when William Hooker died 10 years later. As Joseph told his fellow-naturalist Henry Bates in 1870, "It was 16 years before I had an average income of £100 clear from my Science," and that despite his efforts, "it was not til 1855 that I was independent of my father!" (J.D. Hooker to H.W. Bates, [?10/5/1863]: APS: JDH).

Hooker's difficulties in securing an income were further complicated by the need to ensure that his compensation was "honourable." His desire to be a naturalist with a fortune was in part a desire to live up to the ideal of the disinterested gentleman of science, which remained important throughout much of the century. The question of who, precisely, might be considered a gentleman was a vexed one in Victorian Britain, too complex to explore here, but practitioners of the sciences needed to be gentleman because gentlemen were – by definition – truthful, pursuing knowledge with no thought of personal gain. Working without pay was a claim to gentlemanly status and such status had been essential to the credibility of a British man of science since the seventeenth century (Shapin and Schaffer, 1985; Shapin, 1994). As a result, it was not clear whether practicing science for money, becoming a "professional," was entirely respectable. On the rare occasions when Hooker referred to himself as a professional, his tone made it clear that it was not an epithet he took particular pride in. In 1857, for example, he had written to Darwin about the relief he felt in "turning from the drudgery of my 'professional Botany' to your 'philosophical Botany'" (J. D. Hooker to C. Darwin, [11 April 1857]: (Burkhardt and Smith, 1990, p. 369).

The successive volumes of the *Botany of the Antarctic voyage* record Hooker's attempt to establish himself as a philosophical botanist. One aspect of his strategy was to preface the books with increasingly lengthy

essays, setting forth his views on the “affinities, limits, origin, variation, distribution, and dispersion of plants generally” (Hooker, 1853, p. ii). As the essays became longer, Hooker’s ambitions became more apparent. In the introduction to the second volume, the *Flora Novae-Zelandiae* (1853), Hooker included one of his few really ambitious theoretical speculations, that the plants of the Southern ocean were “the remains of a flora that had once spread over a larger and more continuous tract of land than now exists in that ocean” (Hooker, 1853, p. xxi). The suggestion that what were now scattered islands were the remains of a lost Southern continent, inspired by the speculations of his friend Edward Forbes, was an attempt to find a causal account, rooted in geology, that might explain the often perplexing ways in which the southern hemisphere’s plants were distributed.

In the introduction to the final volume, the *Flora Tasmaniae* (1860), Hooker announced his adoption of the view:

that species are derivative and mutable; and this chiefly because, whatever opinions a naturalist may have adopted with regard to the origin and variation of species, every candid mind must admit that the facts and arguments upon which he has grounded his convictions require revision since the recent publications by the Linnean Society of the ingenious and original reasonings and theories by Mr. Darwin and Mr. Wallace (Hooker, 1860, p. ii).

Hooker embraced Darwin’s theory of evolution in print within weeks of the *Origin of Species* being published, however – as we shall see below – his adoption of Darwin’s theories was more complex than it initially appears.

One well-established approach to the history of science is to view it primarily as the history of ideas: from this perspective, Hooker’s speculations about the geological or evolutionary changes responsible for the present distribution of the earth’s floras are exactly what we would expect “philosophical” to mean: scientific theories of the most abstract kind. In this sense, the term derived from the tradition of natural philosophy, understood as an investigation into the causes of natural phenomena, by contrast with natural history, which merely described those phenomena. Hooker’s ideas are indeed one aspect of his desire to be philosophical, to raise the status of botany, so that it could take its place alongside more prestigious, rigorous and mathematical studies such as astronomy. However, the meanings of philosophical went much deeper. A biographical perspective is needed to make it clear how the practicalities of science, including earning a living from it, are invariably entangled with the formulation of scientific ideas.

Early in their friendship, Darwin had asked Hooker for some of the *Erebus* grass specimens and Hooker replied that he was doubtful as to their usefulness, telling Darwin that “I did not collect with any idea of having the specimens made such a philosophical use of” (J.D. Hooker to C. Darwin, [25/3/1846]: Burkhardt and Smith, 1987, p. 304). The “philosophical use” in question was to help answer a central question about plant distribution: what role the wind played in spreading the seeds of plants. The study of plant distribution and the laws that explained it were, as we have seen, central to botany’s philosophical claims, but not every specimen could be used to advance these claims. To understand why, we need to come back to Hooker’s seaweed collecting instructions.

What Do People Do All Day?

So, how does a biographical approach allow us to connect seaweed-drying instructions to the business of becoming philosophical?

The simplest but perhaps most obvious fact about such instructions is that there are many surviving examples, both in manuscripts and in print. Being a botanical collector was clearly complicated, requiring skills that went well beyond picking and pressing flowers – and even those activities were more complex than they initially appear.

Darwin’s request for Hooker’s grass specimens had been made on behalf of one of his correspondents, the German naturalist, C.G. Ehrenberg. Ehrenberg wanted to compare samples of grasses from Ascension Island, which Hooker had visited aboard the *Erebus*, with those he had from Malta, in order to help decide whether the wind could transport plants so far. He had specified that “there must be dependable names on them” and Darwin passed on this request to Hooker, telling him that the specimens “must be *named* or else they will be useless” (C.G. Ehrenberg to C. Darwin, 11/3/1846: Burkhardt and Smith, 1987, pp. 298–299, 393–394; C. Darwin to J.D. Hooker, [24/3/1846]: Burkhardt and Smith, 1987, p. 302). *Before* picking anything, a botanist needed to identify it, to know if they were looking at a familiar species not worth the trouble of gathering, or an unknown rarity. Such identification was complex, and Hooker doubted whether his own specimens would meet the required standard.⁶ While at sea, he had written to his

⁶ Identification was becoming more complex in this period because the familiar Linnaean or sexual system of plant classification was being replaced by the more sophisticated natural system, derives from the work of A-P de Candolle and A-L de Jussieu. However, the issues involved are too complex to explore here, see Endersby, 2008, for more details.

father to acknowledge that “The more I think of my former collection[s], the more I fear they must disappoint you, though at the time I knew not how to improve them” (J.D. Hooker to W.J. Hooker, 7/9/1840: JDH/1/3, KEW). Their deficiencies were still on Hooker’s mind 2 years later when he wrote to his friend, the botanist George Bentham, that, “My first collections did not I know give any satisfaction at all, so the less I say about them the better” (J.D. Hooker to Bentham, 27/4/1842: JDH/2/3/, KEW).

The trajectory of Hooker’s life illustrates that, despite having received what was probably the best botanical education then available, his skills (like those of his collectors) took time to develop. While at sea, Hooker had limited access to books and other collections, which made identifying and labelling plants difficult. Moreover, he soon discovered that collecting in hot climates required different techniques from those he had learned from his father; in Australasia, plants often rotted before they could be dried, which required changing the drying paper more often than in temperate climates (and paper itself was often in short supply). Seaweeds, as we have seen, required different handling to flowering plants, even the different kinds of seaweeds needed different treatment. Fungi and orchids often needed preserving in alcohol, and it – like suitable glass jars – could also be hard to find. Living plants required careful packing in their Wardian cases, as well as watering and onboard care, if they were to make it home; Hooker later complained to a correspondent that “we have hitherto been most unfortunate & I now call Wards cases ‘Wards coffins!’” J.D. Hooker to Hector, 8/11/1869: Yaldwyn and Hobbs, 1998, p. 126). Plants that were too big to transport needed to be drawn, which required both artistic skills and a knowledge of the conventions of the genre of scientific illustration. The complexities of the botanical collector’s life were endless.

The problems that faced a well-connected, well-educated naturalist like Hooker were dwarfed by those facing naturalists who lived in the colonies, without access to books, libraries and collections, and cut off from botanical friends who could help them, particularly at a time when countries like New Zealand were still thinly populated by Europeans. The would-be botanist regularly found he was the only white person within a day’s journey, and there was no one to share his botanical interests. For colonial naturalists, isolation could also be an asset, since they had almost unique access to the plants of their neighbourhood and the longer they lived in the colony, the more local knowledge they acquired, which was vital for effective collecting. Local knowledge greatly enhanced the colonial naturalist’s bargaining power as they

began to barter with distant metropolitan experts; understanding their biographies became essential to interpreting their relationships with Hooker.

The copious written instructions that Hooker sent his collectors were intended as a substitute for the oral instruction that would have been common in Europe. His main goal was, of course, to improve the quality of the specimens he received. The very complexity of the instructions is a useful reminder that botanical specimens were not plants, but artefacts, carefully crafted according to exacting standards that were set and maintained in the metropolis. Good specimens needed names, they had to be identified and labelled according to the classificatory system promulgated by Hooker; they thus came to embody his ideals of classification (Endersby, 2009). Properly prepared and labelled specimens saved him time and effort, but only well-trained collectors could supply them; the more skilled they became, the more Hooker relied on them. All these skills, and dozens of others, could be learned from other collectors, as long as you lived in a country like Britain where you could join clubs of kindred spirits; much vital knowledge was passed on verbally during field trips or other face-to-face encounters.⁷ One reason I initially opted to study colonial collecting networks was that the distances involved required writing down much that would otherwise not have been recorded.

Most of Hooker's plant specimens came from unpaid enthusiasts of various kinds, and amongst these were the Reverend William Colenso, a New Zealand-based missionary and Ronald Campbell Gunn, who worked as a police magistrate and convict supervisor in Tasmania. Both had corresponded with William Hooker; Joseph met them during his voyage and went on collecting trips with each of them. They became friends and corresponded with each other for many years, and their letters give many insights into how these collecting networks functioned and why these colonists worked so hard without pay.

Colenso devoted considerable time and energy to the science, and his devotion to the Hookers, father and son, was only matched by Gunn's. The sheer numbers of specimens each of these men collected is evidence of how hard they worked, yet they were never paid for their work, but were instead compensated with gifts of various kinds, notably botanical books and journals. Commonplace tools, like sufficient drying paper or a simple magnifying glass, could prove all-but-unobtainable in the colonies. As a result, they became valued gifts. Even a vasculum, a tin box into which freshly picked plants were placed, which was a common,

⁷ See, for example, Secord, 1994 and accounts of field trips in Allen, 1994.

mass-produced object in Britain, was rare in the colonies. When the *Erebus* left New Zealand, Hooker presented Colenso with a vasculum he had brought from Britain; Colenso valued it so highly that it survives to this day.⁸

The collectors' motivations were as diverse as they were themselves; a few wanted money, but many more simply hoped to serve empire, science or God (often all three at once), by collecting and celebrating the natural wonders they had found. Following the collectors' life stories reveals more unexpected motivations, such as loneliness. The year after the *Erebus* returned, Hooker wrote to Gunn to ask, "how your game leg is; & whether bottled ale is good yet?" (J.D. Hooker to Gunn, 10/1844: GC8, ML) Gunn responded that, "Bottled ale agrees uncommonly—but alas I have no Botanical friend to crack a bottle with" (Gunn to J.D. Hooker, 28/5/1845: KDC218, KEW). Bottled ale, vital though it is to the work of the botanist (and to the historian of botany), initially seems irrelevant to the business of becoming philosophical. However, in the absence of a cash nexus, Hooker had to maintain his friendships with his collectors in order to keep the specimens coming. His biography illuminates the way collecting networks functioned: for example, his struggle to find respectable paid work is a reminder that he could not have afforded to pay for specimens, even if men like Colenso and Gunn would have accepted payment. Similarly, his life story reveals that he often felt lonely while on his travels, which helped create a bond with his collectors. The affective dimensions of scientific networks remain an important but rather neglected aspect of their history and their significance is only revealed by a broadly biographical approach.

However, while friendships helped the network run smoothly, its members remained conscious of their interests and the ways in which their correspondents might advance them. Asking Gunn for a specimen, Hooker wrote "you have little idea of the immense rarity of these things, I would give a guinea for a single carpel of the umbelliferous plant" (J.D. Hooker to Gunn, 13/5/1844: GC8, ML). In fact, Gunn had a clear sense of the "immense rarity" of his collections, knowing the difficulties Hooker would otherwise face in obtaining them. He noted of one consignment that "You will perceive by the above list that the far greater Number are *very rare plants*," adding that "Against *these* I shall draw *handsomely*" Gunn to J.D. Hooker, 14/4/1845: (Burns and Skemp, 1961, p. 111). Yet as this and other letters make clear, Gunn's main motivation was to be accepted as a gentleman, by pursuing his scientific

⁸ It and several other items relating to Colenso that are kept at the Hawke's Bay Museum & Art Gallery, Napier, NZ.

pastime in a gentlemanly way – for love not money. He used his specimens to acquire books, not cash, so that he could improve his skills and gradually be accepted as Hooker's scientific and social equal. He responded to a later letter from Hooker's by commenting that its "account of the Rewards bestowed upon Science & learning in England is not encouraging," but that "it hardly required your letters to satisfy me that Natural History must be followed for its own sake alone by enthusiasts like ourselves" (Gunn to J.D. Hooker, 26/9/1844: KDC218, KEW). Gunn's choice of phrase encapsulates his social aspirations.

By contrast, Colenso hoped to be taken seriously as a man of science, an aspiration that complicated his relationship with Hooker, especially as Colenso came to feel that he was best-qualified to give scientific names to his adopted country's plants. This was something Hooker would not allow, since he was intent on reserving the right to name to those in the metropolis. When Colenso tried to name some supposedly new fern species, he received a sharply worded rebuke from Hooker, "From having no Herbarium you have described as new, some of the best known Ferns in the world."⁹ Hooker used his vast libraries of books and specimens as an argument for keeping the right to name in the metropolis, but these resources could not have been acquired and certainly could not be expanded without Colenso's help. Hence Hooker's decision to help Colenso join both the Linnean and Royal Societies, despite privately doubting the missionary's scientific credentials, and well-aware that an "FRS" would only encourage Colenso's desire to name new species.

Hooker's complex negotiations with men like Colenso and Gunn were further complicated by their refusal of pay. On the eve of his ordination, Colenso had written "I think you know my mind—to be devoted to the welfare of the poor Natives. *As a recreation*, however, Botany is, and will be, my darling pursuit" (Colenso to JD Hooker, 17 July 1843: JDH/2/1/4, KEW). In similar terms, Gunn described his reasons for collecting as "purely taste, and a mind bent upon some pursuit, and not necessity or for a livelihood" (Gunn to WJ Hooker, 14/9/1834: Burns and Skemp, 1961, pp. 39–40). As previously noted, until very late in the nineteenth century, men of science who we would now classify as "amateurs" frequently held higher status than those who we would now call professionals. By refusing payment, both Gunn and Colenso were making a fairly explicit claim to a status that rivalled, or even exceeded, Hooker's, since – unlike them – he needed to find *paid* scientific work.

⁹ Hooker's letter has not survived, but fortunately Colenso quoted Hooker's acerbic comment in his reply, Colenso to J.D. Hooker, 24/8/1854: (1854–1900).

It is only by attending to the shape of Hooker's life story that the connections between earning money and establishing social and scientific status become fully apparent. For example, the colonial networks reveal another reason why Hooker and his contemporaries invariably preferred to describe themselves as "philosophical," rather than professional botanists. What linked the term's many meanings was that it described the quality of someone's work, not the way in which they financed their science; as such it cut (quite deliberately I would argue), across the amateur/professional divide that is generally taken for granted by the narratives of professionalisation. People were judged to be philosophical according to the quality of their specimens, their ideas and even their manners; the word united those who would otherwise be divided by doubts about the relative social standing of paid and unpaid scientific practitioners.

Conclusion

The many meanings of the term "philosophical" (which I have certainly not exhausted here) illustrate the intimate links between earning a living and establishing a reputation as a scientific speculator worthy of respect. These links serve as a useful reminder that the distinction I drew previously, between the practical (imperial and economic) and intellectual goals of the natural history sciences, is not one that most mid-Victorian naturalists would have recognised. In the context of Hooker's life and career, the interests of science and empire were inseparable; science existed to serve empire and the empire to serve science, discovering and exploiting knowledge were usually regarded as a single, noble enterprise.¹⁰ So, despite the analytical usefulness of this distinction to the historian, we should not use it to make anachronistic attempts to distinguish our historical actors' merely tactical goals from their supposedly genuine scientific ones. Thinking about Hooker's life and interests, rather than the long-term shape of the Victorian scientific community, reminds us that for most Victorian men of science the point of understanding the world was to change it in ways that reflected Britain's interests and, of course, served their own interests too.

Like many of his contemporaries, Hooker was dependent on networks of unpaid collectors. This explains something that has occasionally puzzled historians: why Hooker seems to have been both

¹⁰ For more on this topic, see Drayton, 2000; Endersby, 2008; and several articles in a recent issue of *Isis* (vol. 101, 2010), especially Sivasundaram, 2010.

enthusiastic about *and* dismissive of Darwin's ideas. When Hooker publicly adopted Darwin's theory, he explained that when it came to the vital topics of plant distribution and classification, natural selection would enable botanists to form "more philosophical conceptions on these subjects." And yet, on the same page, he stressed that, "the believer in species being lineally related forms *must employ the same methods of investigation and follow the same principles* that guide the believer in their being actual creations" (Hooker, 1860, p. iv. Emphasis added). Some historians have interpreted this apparent ambivalence as evidence that he was a late, and perhaps reluctant, convert to evolution.¹¹ However, the idea of Hooker as a half-hearted convert is somewhat difficult to reconcile with Darwin's assertion that Hooker was "the one living soul from whom I have constantly received sympathy" – this was in response to Hooker acknowledging that Darwin's theories had long been a "jam-pot" to him (Burkhardt and Smith, 1991, p. 174).¹² The apparent puzzle is a product of focussing on Darwin's story rather than Hooker's. Once Hooker's career is central, it becomes clear that his publications effectively had two audiences: his fellow metropolitan gentlemen needed to read about "more philosophical conceptions" while ambitious colonial naturalists needed to be dissuaded from formulating their own speculations.

One key way in which Hooker became a philosophical naturalist was by tacitly accepting Gunn's claims to genteel status and by smoothing Colenso's often-ruffled feathers with gifts and acknowledgements, and above all with friendship. Colenso responded by trying to ensure that his specimens met Hooker's exacting standards, but a key part of those standards was that specimens be named according to standards set in the metropolis. A collector who consistently failed to do so, would eventually be dropped from the network, so even the recalcitrant Colenso had to accept the bulk of Hooker's metropolitan names if he was to be recognised as competent. Compliance had to be negotiated

¹¹ For example: Leonard Huxley argued that Hooker changed his mind about the fixity of species between the writing of the *Flora Novae-Zelandiae* and the *Flora Tasmaniae* (Huxley, 1918, p. 481); WB Turrill argued that 'Hooker was gradually forced to accept fully the theory of evolution' (Turrill, 1963, p. 76); Ray Desmond's biography proposes that Hooker did not finally accept Darwin's view until April 1859 (Desmond, 1999, p. 208); and Adrian Desmond and James Moore also take the view that Hooker was a late convert (Desmond and Moore, 1991, pp. 373, 415). See also Bellon, 2006.

¹² Richard Owen, writing anonymously in the *Edinburgh Review*, also recognised Hooker as an early supporter of Darwin. In his savaging of the *Origin*, Owen described Hooker as 'one of the disciples' of Darwin and was attacked for being 'as short-sighted as the master' ([Owen], 1860, pp. 487–532). See also Hull, 1973, pp. 171–215.

since Hooker had no power to impose his will, and these negotiations were much more complex than many prevailing models of imperial science would lead us to expect.

Historians are, almost by definition, paper-consuming creatures. Busy in archives and libraries, reading, thinking and writing. So it is perhaps inevitable that our attempts to understand the past begin with its written traces. Moreover, we are speculators and theorists ourselves, and so are likely to focus on the records of these activities, rather than the seemingly mundane business of drying seaweeds or reminiscing about bottled ale. But in doing so we run the risk of putting the cart of theory before the horse of practice. Someone like Hooker had to spend many years travelling, collecting, corresponding, classifying and seeing before he could begin publishing. Understanding that requires ignoring confessions of murder while you wade through many letters about seaweed-drying. The written details make even more sense when used alongside collections of artefacts (such as specimens and collecting tools); being able to look at the actual specimens that Hooker described as good or bad is vital to understanding what such terms meant. Such seemingly prosaic matters as preserving your seaweeds and persuading your hardest-working collectors to cede the right to name, had to be dealt with before a naturalist had either the ability or the right to speculate about missing continents and the transmutation of species. Yet, a conventional history of ideas approach would surely pick out these aspects of Hooker's work and ignore the biographical details that made them possible. Thinking about Hooker's whole life was the first step to understanding him. To take a simple example, Hooker's ideas did not emerge from nowhere, but were shaped by his practices; a biographical approach requires us to re-think the very idea of "scientific practice," since thinking about when and why he travelled, who he met and what they did on their travels, reminds us that making friends over a bottle of beer is as much a scientific practice as analysing the distribution of the plants collected while the beer is being consumed.

Perhaps the single most important thing I have learned about Hooker is that what was true of him was true of many other Victorian naturalists (such as Huxley, John Lindley, Edward Forbes, Arthur Henfrey, John Edward Gray and Hewett Cottrell Watson). Like his contemporaries, Hooker had to find paid scientific work during a period when there were few established careers, few scientific institutions, and almost no recognised scientific training; even more importantly, it was a period when the respectability of being paid to do science was still in doubt, which compounded the difficulties the naturalists faced. Like

Huxley and many others (such as Colenso, Gunn, Ferdinand von Mueller, William Swainson, William Sharp MacLeay, Robert Lynd, and John MacGillivray), the empire offered opportunities for personal advancement through scientific work, although the very varied careers of the men listed illustrate how difficult it could be to turn a sojourn in the colonies into a secure paid position. Hooker was also typical in having to respond to the challenges posed by Darwin's theories. However for him (and, I suspect, for many others) Darwin threatened to upset scientific practices rather than religious beliefs. Hooker's typicality, especially the ordinariness of his daily scientific work, were one reason why he proved not to be worthy of a full-blown biography, but it was the attempt to write one that led me thinking about him biographically, and that made me realise how important his ordinariness was.

Bibliography

Manuscript Sources

- APS: JDH. *J.D. Hooker Papers* (B/H76, 1970 1495ms), American Philosophical Society, Philadelphia.
- GC8, ML. *Gunn Correspondence* (vol. 8), Archives, Mitchell Library, State Library of New South Wales, Sydney.
- JDH/1/3, KEW. *Joseph Hooker Letters & Journal*. Archives, Royal Botanic Gardens, Richmond, Surrey.
- JDH/2/3/, KEW. *Letters from JD Hooker (BEN-BUR)* (vol. 2), Archives, Royal Botanic Gardens, Kew, Richmond.
- JDH/2/1/4, KEW. *Letters to JD Hooker (CAD-COL)* (vol. 4), Archives, Royal Botanic Gardens, Kew, Richmond.
- KDC174, KEW. *Kew Director's Correspondence, vol. 174* (vol. 174), Archives, Royal Botanic Gardens, Kew, Richmond.
- KCL/13/1, KEW. *Kew Collector's List, vol. 8* (vol. 8), Archives, Royal Botanic Gardens, Kew, Richmond.
- KDC218, KEW. *Kew Director's Correspondence, vol. 218* (vol. 218), Archives, Royal Botanic Gardens, Kew, Richmond.

Published

- Allan, M. 1967. *The Hookers of Kew, 1785–1911*. London: Michael Joseph.
- Allen, D.E. 1994. *The Naturalist in Britain: A Social History*. Princeton, NJ: Princeton University Press.
- Baber, Z. 1996. *The Science of Empire: Scientific Knowledge, Civilization and Colonial Rule in India*. Albany: State University of New York Press.

- Barton, R. 1998. "Huxley, Lubbock, and Half a Dozen Others: Professionals and Gentlemen in the Formation of the X Club, 1851–1864." *ISIS* 89(3): 410–444.
- 2003. "Men of Science": Language, Identity and Professionalization in the Mid-Victorian Scientific Community." *History of Science* xli: 73–119.
- Bellon, R. 2001. "Joseph Hooker's Ideals for a Professional Man of Science." *Journal of the History of Biology* 34: 51–82.
- 2005. "A Question of Merit: John Hutton Balfour, Joseph Hooker and the 'Concussion' Over the Edinburgh Chair of Botany." *Studies in the History and Philosophy of the Biological and Biomedical Sciences* 36: 25–54.
- 2006. "Joseph Hooker Takes a 'Fixed Post': Transmutation and the 'Present Unsatisfactory State of Systematic Botany', 1844–1860." *Journal of the History of Biology* 39: 1–39.
- Brockway, L. 2002. *Science and Colonial Expansion: The Role of the British Royal Botanic Gardens*, 2nd (reprint) ed. New Haven: Yale University Press.
- Burkhardt, F. and Smith, S. (eds.). 1987. *The Correspondence of Charles Darwin (Volume 3: 1844–1846)*. Cambridge: Cambridge University Press.
- 1990. *The Correspondence of Charles Darwin (Volume 6: 1856–1857)*. Cambridge: Cambridge University Press.
- 1991. *The Correspondence of Charles Darwin (Volume 7: 1858–1859)*. Vol. 7. Cambridge: Cambridge University Press.
- Burns, T. and Skemp, J. (eds.). 1961. *Van Diemen's Land Correspondents: Letters from RC Gunn, RW Lawrence, Jorgen Jorgenson, Sir John Franklin and others to Sir William J Hooker, 1827–1849*. The Records of the Queen Victoria Museum: Launceston. Launceston: Queen Victoria Museum.
- Cawood, J. 1979. "The Magnetic Crusade: Science and Politics in Early Victorian Britain." *Isis* 70: 492–518.
- Desmond, A. 2001. "Redefining the X Axis: 'Professionals', 'Amateurs' and the Making of Mid-Victorian Biology – A Progress Report." *Journal of the History of Biology* 34: 3–50.
- Desmond, A. and Moore, J. 1991. *Darwin*. London: Michael Joseph.
- Desmond, R. 1999. *Sir Joseph Dalton Hooker: Traveller and Plant Collector*, 1st ed. Woodbridge, Suffolk: Antique Collector's Club.
- Drayton, R.H. 1999. "Science, Medicine, and the British Empire." R.W. Winks (ed.), *Historiography*, Vol. V. Oxford: Oxford University Press, pp. 264–276.
- Drayton, R.H. 2000. *Nature's Government: Science, Imperial Britain and the 'Improvement' of the World*. New Haven: Yale University Press.
- Endersby, J. 2008. *Imperial Nature: Joseph Hooker and the Practices of Victorian Science*. Chicago: University of Chicago Press.
- Endersby, J. 2009. "Lumpers and Splitters: Darwin, Hooker, and the Search for Order." *Science* 326(5959): 1496–1499.
- Heyck, T.W. 1982. *The Transformation of Intellectual Life in Victorian England*. London: Croom Helm.
- Hooker, J.D. 1853. *Introductory Essay to the Flora Novae-Zelandiae*. London: Lovell Reeve.
- 1860. *On the Flora of Australia: Its Origin, Affinities and Distribution, Being an Introductory Essay to the Flora of Tasmania*. London: Lovell Reeve.
- Huxley, L. 1918. *Life and Letters of Joseph Dalton Hooker*, Vol. I. London: John Murray.

- Hull, D.L. (ed.). 1973. *Darwin and His Critics: The Reception of Darwin's Theory of Evolution by the Scientific Community*, 1st ed. Cambridge, Mass: Harvard University Press.
- MacLeod, R. 1987. "On Visiting the Moving Metropolis." N. Reingold and M. Rothenberg (eds.), *Scientific Colonialism*. Washington: Smithsonian Institution Press, pp. 1–15.
- Miller, D.P. and Reill, P.H. (eds.). 1996. *Visions of Empire: Voyages, Botany, and Representations of Nature*. Cambridge: Cambridge University Press.
- Morrell, J.B. 1996. "Professionalisation." R. Olby, et al. (eds.), *Companion to the History of Modern Science*. London: Routledge, pp. 980–989.
- Porter, D. 1993. "On the Road to the Origin with Darwin, Hooker, and Gray." *Journal of the History of Biology* 26(1): 1–38.
- Raj, K. 2000. "Colonial Encounters and the Forging of New Knowledge and National Identities: Great Britain and India, 1760–1850." *Osiris* 15: 119–134.
- Rudwick, M. 1972 (1985). *The Meaning of Fossils: Episodes in the History of Palaeontology*. Chicago: University of Chicago Press.
- 1985. *The Great Devonian Controversy: The Shaping of Scientific Knowledge Among Gentlemanly Specialists*. Chicago: University of Chicago Press.
- Secord, J.A. 1986. *Controversy in Victorian Geology: The Cambrian-Silurian Dispute*. Princeton, NJ: Princeton University Press.
- 1994. "Science in the Pub – Artisan Botanists in Early-19th-Century Lancashire." *History of Science* 32(97 Pt3): 269–315.
- 1997. "Introduction to Lyell's Principles of Geology." *Principles of Geology*. Harmondsworth: Penguin Books, pp. ix–xlvii.
- Shapin, S. 1994. *A Social History of Truth: Civility and Science in Seventeenth-Century England*. Chicago: University of Chicago Press.
- Shapin, S. and Schaffer, S. 1985. *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton: Princeton University Press.
- Sivasundaram, S. 2010. "Sciences and the Global: On Methods, Questions, and Theory." *Isis* 101(1): 146–158.
- Turrill, W.B. 1953. *Pioneer Plant Geography: The Phytogeographical Researches of Sir Joseph Dalton Hooker*. The Hague: Martinus Nijhoff.
- 1963. *Joseph Dalton Hooker: Botanist, Explorer and Administrator*. London: Scientific Book Club.
- Yaldwyn, J. and Hobbs, J. (eds.). 1998. *My Dear Hector: Letters from Joseph Dalton Hooker to James Hector 1862–1893*. Wellington: Museum of New Zealand Te Papa Tongarewa.
- Young, D. 1992. *The Discovery of Evolution*. Cambridge: Cambridge University Press.