

## Joseph Hooker: a philosophical botanist

JIM ENDERSBY

History Department, University of Sussex, Brighton, BN1 9SH, UK

(Email, J.J.Endersby@sussex.ac.uk)

The nineteenth-century British botanist, Joseph Dalton Hooker, was one of the people whose career became a model for that of the modern, professional scientist. However, he preferred to refer to himself as a philosophical botanist, rather than a professional. This paper explores the reasons for this choice, and analyses Hooker's imperial approach to plant classification, the consequences of which are still with us.

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In July 1855, the British botanist, Joseph Dalton Hooker, admitted to 'a sort of wicked satisfaction' at the prospect of having 'sprung a mine under the feet' of his fellow botanists. The 'mine' was a small book, the *Flora Indica*, in a privately printed edition of just 250 copies, which Hooker hoped would mark the beginning of a full-scale flora of India (figure 1). Why did Hooker hope it would make such a bang, and why did he want it to?

Joseph Dalton Hooker (1817–1911, figure 2) was the younger son of William Jackson Hooker, Regius Professor of Botany at Glasgow University. He was a traveller, explorer and plant collector who would eventually become director of the Royal Botanic Gardens, Kew and president of the Royal Society. He was co-author (with George Bentham) of the *Genera Plantarum* (1862–83), one of the founding documents of modern classification. Despite having been one of the nineteenth-century's most influential scientific figures, if Hooker is remembered at all today, it is because he was one of Charles Darwin's closest friends.

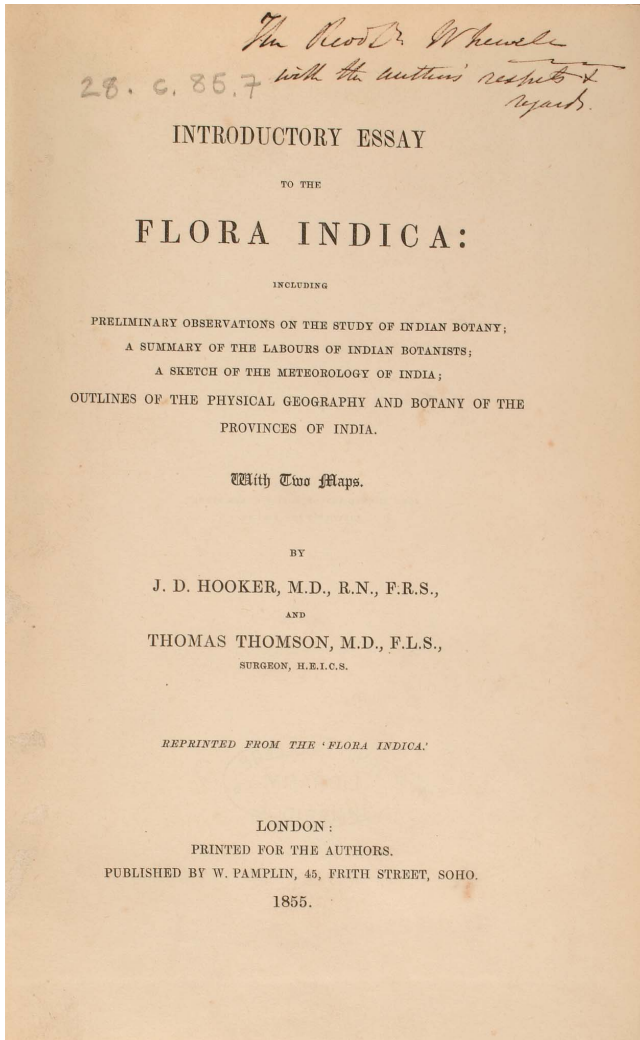
When Hooker was born, there were no scientists. The word itself would not be coined until 1833 (by the Cambridge polymath and master of Trinity College, William Whewell), and it did not come into regular use in Britain until many decades later. For much of the nineteenth century, practitioners of the sciences referred to themselves by their specialisation (botanist, geologist, physicist and so on) or collectively as men of science (and they were almost all men at that time), devotees or cultivators of science. By the time Hooker died in 1911, all that had changed. Scientists had become an important part of society in Britain and around the world; dressed in white coats, working in laboratories,

university-educated, peer-reviewed, funded by government and industry, the modern scientist had arrived. Hooker was one of the people who created the modern scientist. He was one of the first British men of science to pursue a government-funded scientific career, but – much more importantly – he was one of the first to demonstrate that such a career could be respectable, that it was possible to be a full-time philosophical botanist (Endersby 2008).

Although William Hooker had influence and contacts in the world of early-nineteenth-century science, he did not have a large fortune, so Joseph began his career as an assistant surgeon aboard a British naval vessel, HMS *Erebus*, which spent four years on a major scientific survey in the Antarctic (1839–43).

During the voyage, Hooker wrote to his father to say that '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' (J D Hooker to W J Hooker, 18 May 1843; Huxley 1918a: 165). As this comment makes clear, being a naturalist with a fortune – as opposed to being a paid professional – would have been his first choice. Throughout much of the nineteenth century, British men of science remained uncertain as to the respectability of being paid to do science. The traditional ideal of the man of science, which dated back to the founding of the Royal Society in the seventeenth century, was that a practitioner of the sciences must be a gentleman first. A key aspect of that notion was that he be independently wealthy; not needing to make money from his scientific discoveries would guarantee his disinterestedness and thus his truthfulness. The meaning of the term 'gentleman' shifted during the

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**Figure 1.** Title page of the *Flora Indica*, 1855 (copy presented to William Whewell, courtesy of Trinity College, Cambridge).

nineteenth century, becoming deeply ambiguous as the claims of Britain's landed aristocracy to be the country's natural rulers were disputed by the rising middle classes. Nevertheless, it retained the connotation that disinterested service rather than paid employment was the proper way to pursue science. These ideals made life complicated for those, like Hooker, who wished to live by them, but still needed to earn a living.

When Hooker returned to Britain in 1843, he discovered that 'honourable compensation' was hard to come by. Scientific positions of any kind were still rare in Britain and the main sources of employment for botanists were university positions teaching *materia medica* to trainee apothecaries – those who occupied the lowest rank of the generally despised medical profession. Thanks to his father's contacts, Hooker was able to obtain an admiralty grant to finance the publication of *The Botany of the*

*Antarctic Voyage*. William Hooker was by now director of Kew and Joseph was able to use its resources, along with his father's herbarium and library, but there was to be no paid position for him at Kew until 1855. Having failed to obtain a post at Edinburgh University, Hooker spent a brief period as botanist to the Geological Survey before managing to obtain government support for a trip to India from 1847–51. After travelling through Sikkim in the Himalaya, Hooker spent 1850 travelling with Thomas Thomson, an old friend from Glasgow University days, in Eastern Bengal.

William Hooker's income from botany had always been meagre. His position at Glasgow was not well-paid, but the directorship of Kew brought in even less money, so Hooker senior continued the practice he had begun in Glasgow of supplementing his income by publishing botanical works of all kinds. The best-known of William Hooker's publications was the *Botanical Magazine*, which had been founded by the Quaker naturalist William Curtis in 1787. When Hooker took control, he worked to make the magazine more scientific, but he still needed to reach a broad audience, particularly the growing numbers of amateur gardeners. The *Botanical Magazine* described new species in technical detail, but also gave handy hints about their cultivation.

In 1849, while Joseph Hooker was still in India, his father arranged to publish the first of three parts of *The Rhododendrons of the Sikkim-Himalaya* (figure 3), a beautifully illustrated summary of the thirty-one species of the plant that Joseph Hooker had discovered during his travels, 25 of which were new to European science. When the *Athenaeum* reviewed the final part, they described the speed with which these newly discovered plants had been published as 'one of the marvels of our time'. Hooker told his father that 'the work makes me feel three inches taller, but I feel I owe it all to you'.

However, the rhododendrons were one of the few popular works that Joseph Hooker produced (and, as we have seen, it was largely his father's work). Illustrated books were a useful source of income, but Joseph Hooker never put much time or energy into producing them, because such works could not satisfy his most urgent ambition: to be considered a 'philosophical' botanist. Philosophical was a term that was invariably preferred to 'professional' in this period, not least because it defined practitioners by the quality of their work, *not* by the way in which they earned their living. It was a term with many meanings, but the primary route to the prized epithet was to engage in speculation about arcane matters such as the geographical distribution of plants; merely classifying plants was not enough, nevertheless speculations had to be built on a solid foundation of meticulous classification.

Hooker's idea of philosophical botany is exemplified by the introductory essays to his major floras (which consist



**Figure 2.** Joseph Dalton Hooker (From the original by T B Wirgman held at Kew. Published in the series 'Celebrities of the Day', *The Graphic*, 17 July 1886: 64. (Reproduced with the kind permission of the Director and the Board of Trustees, Royal Botanic Gardens, Kew.)

mainly of plant classifications). The introduction to the *Flora Indica*, which he and Thomas Thomson began work on in the early 1850s, is a good example. The only part to be published consisted largely of a 200-page essay in which Hooker (despite the joint authorship on the title page, the essay was entirely his work; Thomson only worked on the classifications) set-out his views on classification and soundly berated those who carelessly attempted to name new species. The essay notes that the authors had experienced 'considerable difficulty in our proposed attempt to establish the genera and species of the "*Flora Indica*" on a sound and philosophical basis, and to unravel their synonymy' (Hooker and Thomson 1855: v). Synonymy, multiple names being given to the same species, was one of Hooker's major problems, which he blamed on local botanists (such as those who lived and worked in India),

who lacked the global perspective that he was able to bring to the work of classification. As a result, they placed too much emphasis on minor differences between local varieties of a plant, multiplying species unnecessarily and massively complicating the work he had to do.

From Joseph Hooker's perspective, it was essential to reduce the numbers of species and to ensure they were all defined on the same basis. In part, this was a practical necessity: every species required its own separate sheet in Kew's herbarium; the more species there were, the more sheets Hooker needed to keep track of. But more importantly, from Hooker's imperial perspective, the key issue was the overall patterns of vegetation, the general nature of floras, rather than the fine detail of precisely how many species or varieties each location contained. This concern was partly shaped by the need for Kew to advise government on crop



**Figure 3.** *Rhododendron barbatum* (from J D Hooker, *Rhododendrons of the Sikkim Himalaya*, 1849. Courtesy of the Cory Library, Cambridge University Botanic Garden).

transplantation, a major activity at a time when the British empire was largely dependent on plant-based commodities, from tea to timber, and cotton to cinchona. Part of Hooker's interest in plant distribution was to understand the laws that determined why a crop would thrive in one country but not another; too much detail merely hindered his search for these wider patterns (figure 4).

It was Hooker's role in imperial service, particularly in India, that eventually led to his being knighted. More importantly, the way in which he (and his father before him) had put his personal expertise and resources at the nation's service allowed Hooker to remain a gentleman, even while he was a government employee. In the course of Joseph Hooker's directorship of Kew, he became embroiled in a public dispute with Acton Smee Ayrton, the government minister responsible for the gardens. In reporting the matter, the newspapers commented sympathetically on the comparatively low salaries that Hooker and his father received, referring to their work as 'disinterested' and

describing Hooker as a gentleman (in sharp contrast to the notoriously boorish Ayrton).

Hooker's passion for reducing the numbers of species he had to deal with is apparent from a letter he wrote to his friend the botanist George Bentham. Hooker described his labours on the *Flora Indica* as 'wild and exciting work, the species go smash smash every day'. Bentham was a little alarmed by the ferocity of Hooker's desire to reduce the overall numbers of species by purging the catalogue of those he thought incorrect. Hooker replied that:

"I admire your great caution and desire to curb my rabid radicalism: but the tide will turn one day and the reducing species will go on apace, and then the reaction will be terrific. After all there is something to be said for me. I am a *rara avis*, a man who makes his bread by specific Botany, and I feel the obstacles to my progress as obstacles on my way to the butcher's and baker's. What is all very pretty play to amateur Botanists is death to me (JD Hooker to Bentham, [1853]: Hooker, J D, Archives, Royal Botanic Gardens Kew, JDH/2/3/)."

Hyperbole concealed an important truth: he did indeed make his bread by specific botany, i.e. by classification. Fixing the numbers of species on clear, well-defined principles was the essential first step in speculating about their origins and distribution; those who cluttered the catalogues with ill-defined species, or who inadvertently gave new names to existing species really did hinder Hooker's progress towards attaining honourable compensation for his work.

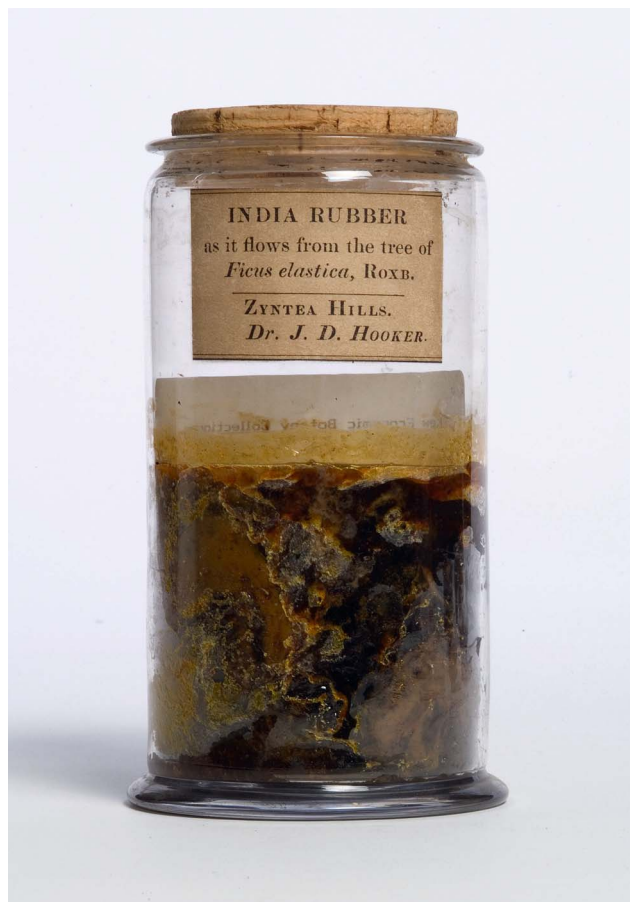
The major problem faced by the would-be philosophical botanist was finding someone to pay for their work. In 1851, Hooker and Thomson had succeeded in getting the British Association to support their projected flora and to petition the Court of Directors of the East India Company to finance it. As Hooker commented, rather tactlessly, in the introduction to the flora:

"In reply to this recommendation, the Court declined promoting the object, but expressed a willingness to take its merits into consideration on its completion. The President of the British Association, in communicating to us this answer, at the same time intimated to us the hopes of his colleagues that we should at least commence the work. This we did, but, we must confess, with a feeling of discouragement, for the unfavourable answer of the Court materially retarded our progress (Hooker and Thomson 1855: 7)."

As a result, the publication of the *Flora's* first part had to be paid for using a small inheritance from Thomson's father. Almost half the print run was given away gratis to influential people who the authors hoped might help it gain patronage.



**Figure 4.** Detail of a map of Hooker's proposed 'Botanical Provinces' of India (from the *Flora Indica*, 1855. Reproduced with the kind permission of the Director and the Board of Trustees, Royal Botanic Gardens, Kew).



**Figure 5.** Sample of rubber collected by Joseph Hooker in India. (Reproduced with the kind permission of the Director and the Board of Trustees, Royal Botanic Gardens, Kew.)

Hooker hoped for strong reactions to his strongly worded strictures about classification. He asked a fellow-botanist who was visiting Paris how the French botanists were reacting to the *Flora Indica*, adding: ‘I have frightened them here out of their wits, and some of them thank me for the presentation copy with a frigidty that delights me’. Hooker commented that:

“Hitherto 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, and so I have a sort of wicked satisfaction in seeing the fuse burn that is I hope to spring a mine under the feet of my chers confrères, and though I expect a precious kick from the recoil and to get my face blackened too, I cannot help finding my little pleasure in the meanwhile (J.D. Hooker to Bentham, 7/1855: Hooker, J D, Archives, Royal Botanic Gardens Kew, JDH/2/3/).”

Hooker hoped his essay would end the period of ‘dull work’ and ‘little pay’, by provoking quarrels over ‘grand principles’ that would establish him as a philosophical speculator, thus giving him the prestige to transform his ‘utter disbelief’ in the stability of his genera and species.

However, raising his status and that of his science required the East India Company’s patronage, which Hooker and Thomson had some grounds to hope for. Thomson was a surgeon in the Company’s army and Hooker had just been appointed an official examiner for the Company, examining medical students on their botanical knowledge (which remained a compulsory part of medical training throughout the century). Yet not only were their pleas ignored, but in Hooker’s opinion, the East India Company went out of its way to sabotage the project. He told an Indian acquaintance that:

“I am so disheartened with the *Flora Indica* and the knavish conduct of the Court of Directors.... You are aware, I think, that after paying all the expenses of the 1st vol. we put a merely nominal price on the 130 copies we put out for sale (after giving away 120), and that John Company, after refusing to subscribe for copies, or promote the work, or repay the authors, on hearing how cheap it was, *bought up 100 copies unknown to us*, which threw the work out of print, and left us £200 out of pocket, and our object defeated! I never was so sold in my life. I have begged and implored in vain that they give back the copies and I have offered back not only the money but to give them gratis 100 copies of the Introductory Essay. As to poor Thomson, they will not give him 1s. for time or labour or expenses. Have not we a good *growl*? (JDH to William Munro, 21 December 1856: Huxley 1918b: 358).”

Hooker and Thomson’s fairly public efforts to embarrass the Company into supporting their flora (*see* the quote above) may have cost them friends at the Court of Directors, but given the fragile state of the Company at this time, its directors had more pressing matters to deal with; by 1855 the Company was close to the end of its rule and was dissolved following the 1857 rebellion.

By the time the British government assumed direct rule over India, Hooker had been appointed deputy director of Kew and his need for patrons had become less pressing. A few years after he succeeded his father as director in 1865 he returned to work on the Indian flora. In 1872, he published the first part of the *Flora of British India* (1872-97), which was ‘published under the authority of the Secretary of State for India’. The flora eventually comprised seven volumes and Hooker was assisted by several other botanists in completing it. In recognition of his services to Indian botany, when Hooker was knighted in 1877 he was made Knight Commander of the Star of India, becoming a

Grand Commander twenty years later. He had outlived John Company and his route to the butcher's and bakers was well and truly secure.

Hooker's success in improvising a career as a philosophical botanist eventually made him into one of the nineteenth century's most influential and powerful scientific men. He was also the first British man of science to publicly defend his friend Darwin's theory of evolution, in his introductory essay to the flora of Tasmania. Darwin's impact within and beyond British science is often described as revolutionary; however it is clear that in Hooker's case what persuaded him to accept Darwin's ideas was their conservatism. Darwin stressed in the *Origin* that the practices of classification would not be changed by his theory, but it would provide a more secure, philosophical footing for the taxonomist's work (Darwin 1859: 413–14). Hooker observed in his essay that all botanists must employ 'the same methods of investigation and follow the same principles'. He went so far as to argue that the believer in evolution only differed 'in practice from him who asserts the contrary, in expecting that the posterity of the organisms he describes as species may, at some indefinitely distant period of time, require redescription' (Hooker 1859: iv). Darwin had persuaded Hooker that species were stable over such long periods, that the vital practices of classification would continue unaffected by Darwin's supposedly revolutionary changes.

Hooker's conception as to what constituted a legitimate species shaped the very nature of the floras in the countries

he and his colleagues described. He insisted on broadly defined species that omitted minor varieties only identifiable by local experts, whether indigenous or settler. Broad species were ideal for the economically and philosophically important business of mapping distribution, but ignored local knowledge and needs. By imposing a broad species definition on the colonies, Hooker also imposed a specifically imperial vision of nature upon the world, a vision shaped by the needs of the British economy and by his own need for a legitimate, secure career. The catalogues of plants he helped create still form the starting point for contemporary ecological, economic and evolutionary studies; the effects of Hooker's philosophical botany are still very much with us.

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