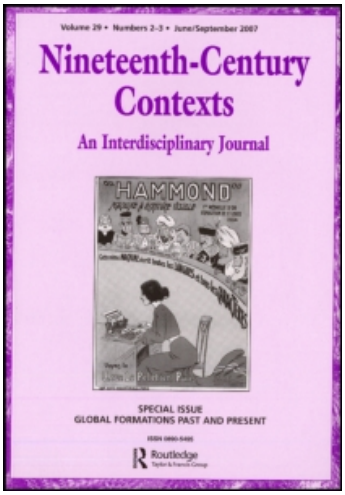


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# Tactics, Groups, Practices: New Work in Nineteenth-Century Science Studies

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**REVIEW ARTICLE**

# Tactics, Groups, Practices: New Work in Nineteenth-Century Science Studies

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**Trying Leviathan: The Nineteenth-Century Court Case that Put the Whale on Trial and Challenged the Order of Nature**
D. GRAHAM BURNETT
Princeton: Princeton UP, 2007
xiv + 266 pp., 35 illustrations. ISBN 978-0-691-12950-1 (hb)

**Darwin, Literature, and Victorian Respectability**
GOWAN DAWSON
Cambridge: Cambridge UP, 2007
xii + 282 pp., 8 illustrations. ISBN 978-0-521-87249-2 (hb)

**Imperial Nature: Joseph Hooker and the Practices of Victorian Science**
JIM ENDERSBY
Chicago: U of Chicago P, 2008
xii + 429 pp., 49 illustrations. ISBN 978-0-226-20791-9 (hb)

These are terrific books—evidence enough, were evidence needed, of the vibrant state of the art in nineteenth-century science studies. All three investigate aspects of the history of biology, but within that general rubric each pursues its own distinct focus. Burnett treats an 1818 court case adjudicating whether to classify a whale as a fish; Dawson considers the sustained campaign waged by opponents of Darwinism to associate it with disreputable sexuality; Endersby anatomizes Joseph Dalton Hooker's career, from his network of correspondents and collectors to his preferred modes of preserving botanical specimens. These topics are intrinsically interesting, and in what follows I do my best to convey the enthusiasm and rigor with which Burnett, Dawson, and Endersby take them up. At the same time, I also want to keep firmly in view these

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books' larger implications, and most particularly the entailments of the different methodological approaches signaled in abbreviated form by the first three words of my title: tactics, groups, and practices.

Gowan Dawson's *Darwin, Literature and Victorian Respectability* provides a wonderfully nuanced and engaging account of how, from the late 1860s on, evolutionary theory increasingly came to be seen as licensing social and sexual transgression. Without contesting the general consensus that Darwin himself enjoyed an impeccable reputation for respectability, Dawson shows that this reputation came under attack, especially following the 1871 publication of *The Descent of Man, and Selection in Relation to Sex*, and that Darwin and the members of his circle responded aggressively to shore it up. Dawson emphasizes "*how* [Darwin's] sexual respectability was actually achieved" (10; my italics), and one comes away from the book with a firm understanding of the degree to which defending the theory of evolution from charges that it fostered immorality involved a concerted, carefully calculated set of tactical maneuvers on the part of its advocates. But the book casts a wider net than this, taking in the public reception of "scientific naturalism" itself. This was T. H. Huxley's coinage for the principle that assumed, in the words of James Ward, "So far as knowledge extends all is law, and law ultimately and most clearly to be formulated in terms of matter in motion" (qtd. in Durant 31–32). Chiefly because it implied materialism and unbelief, such a principle was accused of failing to provide moral guidance—an accusation, Dawson contends, that was "perhaps the most significant impediment to establishing a naturalistic worldview as a morally acceptable alternative to earlier theological outlooks" (4). Viewed from this perspective, familiar episodes of evolutionary controversy like that between Darwin's son Francis and St. George Mivart take on fuller resonance, pronouncements such as Richard Owen's imputing mental defect to those who denied the independent creation of each species appear less anomalous, and a whole relatively unknown undercurrent of attacks on evolutionary theory—not to mention a corpus of evolution-oriented pornography—comes to light.

Six chapters range over sexualized responses to evolution, the association between scientific naturalism and aesthetic poetry, materialism's inter-implication with paganism, evolutionary science and the Obscene Publications Act of 1857, the mathematician William Kingdon Clifford's posthumous reputation, and the late-century pathologization of aestheticism by evolutionists such as Huxley and Henry Maudsley. Each chapter yields valuable insights, but to my mind the most riveting are the second and the fourth. Chapter 2 documents the widespread sense that an evolutionary world was one in which sexuality loomed too large. Most surprisingly, it chronicles persistent attempts to pair evolutionary theory with aestheticism—particularly as incarnated in the poetry of Algernon Charles Swinburne—in the service of condemning both. Evolutionists resisted the connection, in part by deploying in their own work quotations from poetic mainstays of middle-class respectability such as Alfred Tennyson. This resistance notwithstanding, Dawson contends, the lumping together of Darwin and Swinburne was essentially correct: "It was the concerns of the aesthetic writers that were, in reality, often much closer to those of the exponents of Darwinian science than the interests of either Carlyle or Tennyson" (23).

Along similar lines, Chapter 4 explores various attempts at affiliation and disaffiliation with one another conducted by the adherents to scientific naturalism on one hand and Victorian freethought on the other. At the chapter's center Dawson places the 1877 obscenity trial of Charles Bradlaugh and Annie Besant, freethinkers, advocates of free love, and indefatigable disseminators of information about birth control. In preparation for their defense, Bradlaugh and Besant actually wrote Darwin asking him to testify on their behalf. Pleading ill health as usual, he declined to appear—as did most of the other "respectable" scientific men whose presence was requested. Nevertheless, Bradlaugh and Besant pursued the same argument they had hoped to enlist Darwin and others in legitimating: that there was no appreciable difference between Charles Knowlton's *Fruits of Philosophy*, the 1832 treatise on human reproduction that the two were being prosecuted for republishing, and such scientific texts as Darwin's *The Descent of Man* or William Benjamin Carpenter's *Principles of Human Physiology* (1842). Darwin and his supporters, Dawson notes, "clearly [had] to demarcate themselves and their intellectual positions from such disreputable associations" (145), not least because Bradlaugh and Besant were of course quite right: scientific naturalism shared significant values with freethought, just as it did with aestheticism.

A notable strength of *Darwin, Literature, and Victorian Respectability* is its thorough immersion in the periodical press, evidently the outcome of Dawson's participation in the SciPer (Science in the Nineteenth-Century Periodical) project and his co-authorship of *Science in the Nineteenth-Century Periodical: Reading the Magazine of Nature* (Cambridge UP, 2004). Following these debates as they appeared in the periodical press gives a lively sense of their urgency, of editors' involvement in them, and of the powerful role in the dissemination and shaping of scientific thought played by venues such as the *Edinburgh Review*, the *Westminster Review*, and the *Quarterly Review*. It wasn't only the weighty quarterlies that entered the fray: *Punch* and *Fun*, perhaps precisely because of their lack of gravitas, took up the sexual implications of evolutionary theory with special zest. But this strength sometimes gives rise to a corollary weakness, namely the occasional foray into sheer speculation. I am thinking of moments such as the suggestion that Henry Reeve, editor of the *Edinburgh* when reviews of Darwin's *Descent* and Swinburne's *Songs Before Sunrise* appeared in the same number, "perhaps even [made] alterations which made the parallels between [these reviews] still more conspicuous" (47)—or the paragraphs spent teasing out the possibility that Darwin's passing reference to a "Dr. Drysdale" in a letter to Herbert Spencer might have been to a George Drysdale who advocated birth control (146–48). Given the extraordinarily solid case the rest of the book makes, these surmises are unnecessary. Further, they suggest that a methodology so informed by the hermeneutics of suspicion must be rigorously policed lest it render impossible the recognition that, to adapt Freud's apocryphal comment on cigars, sometimes a Dr. Drysdale is just a Dr. Drysdale.

A more significant hesitation arises in connection with one of the book's overarching aims, which takes the form of an attack on the "One Culture" model of relations between science and (non-scientific) culture. The name derives from C. P. Snow's *The Two Cultures* (1959), which famously diagnosed a divide between science and literature in his own era. Looking back on the nineteenth century, writers such as Gillian Beer

and George Levine have argued that it was a time of not two cultures but one. As Dawson represents it, this position celebrates "the Victorian age as the exemplar of [an] organic, unified and invariably creative 'One Culture'"—a notion that, in light of the controversy he so thoroughly canvasses, "becomes difficult to maintain" (219; see also 7, 193). But the advocates of this model are neither as homogeneous a group as such a portrayal suggests nor as rosy in their account of the Victorians. What Levine, for instance, actually avers is that the culture is "one … in two senses: first, in that what happens in science matters inevitably to what happens everywhere else, literature included; and second, in that it is possible and fruitful to understand how literature and science are mutually shaped by their participation in the culture at large—in the intellectual, moral, aesthetic, social, economic, and political communities which both generate and take their shape from them" (5–6). Mutual shaping need not imply organicity, unity, or inevitable creativity. In the end, Dawson's rich study does not undermine the One Culture model so much as show how complex, diverse, and often antagonistic relations among discrete elements of that single cultural field could be.

Complexity, diversity, and antagonism also preoccupy D. Graham Burnett in *Trying Leviathan: The Nineteenth-Century Court Case that Put the Whale on Trial and Challenged the Order of Nature*. The book centers on *Maurice v. Judd*, an 1818 New York City court case trying the question of whether spermaceti, a fatty substance derived from sperm whales and a few other whale-like animals, should be considered fish oil—and thus, by inevitable extension, whether a whale should be considered a fish. Despite its apparently narrow purview, the case affords Burnett the opportunity to detail the taxonomical positions held by a congeries of key players: ordinary citizens, philosophical naturalists, whalers, politicians, and businessmen. While the chapter on the philosophical naturalists most resembles traditional history of science, there and throughout Burnett limns with salutary particularity the thorough entanglement of science with commerce, politics, non-scientific specialist knowledge, regionalism, popular culture, public opinion, and law. So dogged is he in following the promiscuous travels of whale lore across distinct groups and discourses that it is almost as if he were enacting James A. Secord's 2004 call for "realiz[ing] the centrality of knowledge in circulation—of science as a form of communication" (655). As Burnett notes, "knowledge of natural order and natural types 'migrated' across different communities of expertise, and across geographical regions, thereby revealing how the 'new philosophy' of the metropolitan (and largely French) classifying science made its way to American readers, and how such ambitious 'systems' fared in confrontation with folk taxonomies, vernacular natural history, and biblical representations of creation" (8–9). But the mention of "confrontation" signals that *Trying Leviathan* simultaneously exposes a problem for methodological commitments to knowledge in transit insofar as it highlights an instance in which knowledge *fails* to circulate and science takes the form of *mis*communication. Exemplary in this regard is the verdict rendered in *Maurice v. Judd*, a verdict that could not have been better scripted had Burnett fabricated the trial out of whole cloth: after two days of testimony, it took the jury only fifteen minutes to determine that the spermaceti in question was in fact fish oil, and thus that a whale is in fact a fish (178).

Our sense of the absurdity of such a determination undoubtedly makes up part of the pleasure of reading this book. By the time Burnett relates it directly, however, nearly two hundred pages in, it has come to appear much more reasonable—indeed, almost inevitable. For, to begin with, it doesn't mean what we might have thought. That is, nearly all the parties involved were aware that whales' respiration depends on lungs rather than gills; that female whales give birth to live young and nurse those young from mammary glands; that whale tails are oriented horizontally rather than, as in most fishes, vertically; and so forth. The question has to do not with these facts but with how to interpret them, how to weigh their value against other facts such as those adduced by Oliver Goldsmith in his pastiche-cum-translation of Buffon's *Histoire naturelle*, *A History of the Earth and Animated Nature* (first published in 1774), to the 1816 edition of which the legal representatives of the whale-as-fish side appealed. Whales, observes Goldsmith, "are shaped as other fishes; they swim with fins; they are entirely naked, without hair, they live in the water … and never come upon shore but when forced thither" (qtd. 81). As Burnett equips us to understand, to call a whale a fish in 1818 was to embrace such "superficial" facts as definitive—and also, therefore, to side with older scientific accounts and common sense against the new zoology associated with Georges Cuvier and his insistence on the supreme value for classification of internal organization.

In this way *Trying Leviathan* reveals the unevenness of a process of transformation that the history of taxonomy usually narrates as the relatively straightforward replacement of an outmoded system by a newer and better (that is, truer) one. But it does more than that. It makes precise many of the factors responsible for such unevenness. In connection with *Maurice v. Judd*, one of the more decisive of these factors was political and regional interest. The fishy verdict about whales not only extolled Buffon above Cuvier but also, writes Burnett, "express[ed] serious misgivings about the Clintonian vision of philosopher-kings, installed at the heart of a new Athens on the Hudson" (206). The Clinton in question is not Hillary or William Jefferson but DeWitt Clinton, who served at various times in the first decades of the nineteenth century as a U.S. Senator from New York, Governor of New York, and Mayor of New York City. A close political ally of Clinton, Samuel Latham Mitchill, most zealously defended the whale-as-mammal position during *Maurice v. Judd*, and Burnett argues that in deciding against him the jury in the trial aimed to strike a blow at the goal he shared with Clinton of a state and nation governed by experts like himself trained in the latest natural-historical knowledge. Nonetheless, the conclusion to be drawn is not that externalist trumps internalist explanation in the history of taxonomy but rather that the thorough penetration of scientific knowledge by political and other interests vexes the very possibility of distinguishing outside from inside in this case (and by implication in others as well).

Nowhere is this clearer than in the book's discussion of science and law—a topic that seems tailor-made given Burnett's interests and expertise as displayed in two earlier books. The first, *Masters of All They Surveyed: Exploration, Geography, and a British El Dorado* (2000), conducts an exploration of the place of mapmaking in imperialism by way of Robert Schomburgk's cartographic ventures in British Guiana in the 1830s and

1840s. The second, *A Trial by Jury* (2001), is an autobiographical account of Burnett's service on a jury in a capital case that, like *Maurice v. Judd* nearly a century earlier, was tried in a New York City courtroom. *Trying Leviathan* certainly disallows hypostatizing "science" as a realm unto itself, but so, too, does it register the extreme permeability of the juridical realm. Predictably but no less instructively for that, business interests loom large, as is evident from the occasion for the trial in the first place. Samuel Judd, an oil merchant, had refused to pay an inspector's fee to James Maurice for three casks of spermaceti. New York statute mandated that all casks of fish oil be inspected and certified at a cost to the merchant of twenty-five dollars per cask. Judd demurred on the grounds that, since spermaceti came from whales and whales were not fish, spermaceti oil was not fish oil and so fell outside the purview of the statute. At stake, then, were not only competing classificatory systems and political visions but also literal dollars—beginning with the seventy-five that Judd owed Maurice once the jury determined that a whale is indeed a fish.

I've focused so far on the human groups in question, but an equally important group in the book is the one to which whales themselves belong, at least according to the classificatory regime now in favor: cetaceans. Burnett explores how naturalists fit these animals into the natural order, how the whalers who hunted them viewed them, and how they provided, along with classificatory conundrums, light and spectacle. We are presented with gruesome but mesmerizing plates featuring diagrams of the "cutting in" or slaughtering process and log-book pages with drawings that depict, among other things, harpooned whales blowing blood as they surface for air. In commenting on both sorts of image Burnett introduces his most suggestive claim: that whalers elaborated a superficial but nonetheless powerful natural history of whales and their habitat. Cutting-in diagrams drew on and perpetuated a "superficial anatomy" quite different from that of Buffon and Goldsmith; drawings of whales surfacing give evidence of "a veritable natural history of the surface of the ocean" (123, 125). In sum, as lyrically expressed in the caption to Plate 17, "everything in a whaleboat hung on the correct interpretation of the glinting forms that broke, if only for an instant, the surrounding water." This observation, like some of the whales to which it pertains, makes but a fleeting appearance before sinking beneath the surface again. It would be well worth more sustained development.

In a minor irony, although *Trying Leviathan* is all about taxonomy, the book itself in some ways defies categorization—is a "non-descript," to adopt the nineteenth-century term. It is at once ferociously scholarly (the work done in the New Bedford Whaling Museum alone would support an ordinary monograph) and written in prose that aspires to captivate (an aspiration that only occasionally produces an overwrought sentence or two). It might accurately be described as belonging to science studies, legal studies, U.S. history, or historiography. It is committed to studying groups as key data for historical analysis but also deploys biography to good effect. But if one casts about for a reasonable methodological analogue for the whole, one is put in mind of that microhistory pioneered by Carlo Ginzburg and Giovanni Levi and elucidated recently by Mark Salber Phillips, who notes that, for Levi, the rationale for adopting a "microscopic point of view" is its ability to supply a "framework of analysis without which

certain kinds of realities could not be observed" ("Histories" 222; see also "Distance"). I'm far from certain Burnett thinks of himself as having written a microhistory. If not, he has achieved the same aim by other means. Beginning with the court case, following its actors out of the courtroom into the wider world of the early nineteenth century, and then returning to the case again, he brings into sharp focus much that had heretofore been unseen, even unseeable.

Jim Endersby's *Imperial Nature: Joseph Hooker and the Practices of Victorian Science* likewise attempts to illuminate a wide swath by way of painstaking attention to a part of it, in this case the career of the titular Hooker himself, eminent Victorian botanist, close friend of Darwin, and, from 1865 to 1885, Director of the Royal Botanic Gardens, Kew. With Hooker as his *Maurice v. Judd*, Endersby follows out not so much actors as actions, looking to how science was actually done for what this has to say about the formation of knowledge. Whence the book's ten chapters, each titled with a gerund: traveling, collecting, corresponding, seeing, classifying, settling, publishing, charting, associating, governing. The promise of these chapter titles and the book's subtitle is made good in an exhaustive study of what Hooker actually did, not simply what he wrote or thought—a study that well qualifies *Imperial Nature* to stand as the apotheosis of the turn to "practice" in the history of science that began in the late 1980s.

Among the major results is a revised understanding of the oft-discussed professionalization of science that took place over the course of the nineteenth century. The prevailing narrative has been a Whiggish one about how, via the labors of Huxley and his ilk, the amateur status and concomitant need for an independent income that characterized scientific pursuits early in the century gradually gave way to the world we know today of professional scientists working at paying posts. Endersby shows, however, how the longstanding concern that receiving payment for one's work might lower one's social standing made the transition an anxious one. He also reveals a tension between earning an income and devoting oneself to a specifically "philosophical" scientific undertaking, a term that for nineteenth-century natural historians meant "scientific" or "experimental" (OED def. 2b) and was itself suggestive of gentlemanliness. The desire to be philosophical did not, however, imply lab work rather than fieldwork or classification rather than collection. Rather, every aspect of the enterprise, right down to how specimens were preserved, was of necessity shaped by (and in turn shaped) this desire.

*Imperial Nature* makes its case by immersing us in a lost world of materiality. We are treated to a parade of objects necessary for the pursuit of Victorian botany, including the vasculum or collecting case; the Wardian case, progenitor of the terrarium; various kinds of paper for drying and pressing specimens; botanical drawings; and boilers to heat greenhouses. But attention to these objects never strays into antiquarianism. In every instance the specific materiality at issue is demonstrated to be intimately bound up not only with how and what was collected but also with how what was collected was classified—and thus quite literally with the production of a certain version of nature. One of the more compelling examples has to do with natural-historical draftsmanship. The way Hooker and others insisted plants be drawn, Endersby writes, resulted in illustrations that "encapsulated not merely the ideal specimen but a particular conception

of a species; they exemplified an imperial vision of the plant; what was depicted was not the indigenous product of Australia or India but a standardized, generalized, idealized plant, defined in the metropolis and exported back to the colonies to tell their inhabitants what 'their' plants really looked like" (136). That is, not only did the way such drawings were made determine what the plants they depicted really were; because the protocols for such drawings were worked out in Britain, the knowledge resulting from them, even in the case of depictions of "colonial" species, was demonstrably imperial.

Which is one reason for the title of the book: "imperial nature" names the sort of nature Hooker produced. But there are other reasons, too. Hooker's prentice work on the voyage undertaken by HMS *Erebus* from 1839 to 1843, for instance, as well as his subsequent journeys to the Himalayas and Bengal, confirm the constitutively imperial quality of Victorian natural history. The same is true in a different sense of his relations with a network of collectors. Specifically in connection with those relations, Endersby presses the need for changes to a center-periphery model that sees knowledge proceeding from metropolis to colony by way of "diffusion." Instead, he urges, "colonists' responses to the demands of the metropolis can more usefully be thought of in terms of compliance (or the lack of it), in that collectors could choose to adopt or reject metropolitan standards" (315). The import of compliance becomes especially clear in the detailed account of Hooker's relationship with the Reverend William Colenso (1811–99), a missionary whom Hooker befriended when the *Erebus* made landfall in New Zealand. The two carried on a correspondence for six decades and, in scrutinizing the letters they exchanged, Endersby reveals the complex motivations that drove both men, motivations sufficiently overlapping to sustain their prolonged relationship. Hooker needed a reliable colonial collector; Colenso needed friendship as well as a way to participate in the making of scientific knowledge. But they were often at odds. Their paramount struggle was over the status of local versus imperial knowledge, made manifest in clashes over what names to give new species, how to collect properly, and above all whether "splitting" or "lumping" was the wisest approach to classification. By Endersby's lights, Hooker's commitment to "lumping," grouping many varieties of plant into one species rather than splitting them out into many demarcated from one another by relatively small differences, "illuminates the intimate connections between being philosophical, defining species broadly, and earning a living" (168).

To note that *Imperial Nature* reads the history of science as a history of practices, while accurate, fails to convey the extent of its innovations. Endersby's decision to use gerunds as chapter titles, for instance, can best be understood in connection with an earlier book of his, *A Guinea Pig's History of Biology* (2007), organized around organisms that have played major roles in experimental biology: passion flowers, zebra fish, the eponymous rodent (or caviomorph—the order to which it belongs is a matter of ongoing debate), etc. Just as it is somewhat dizzying to think the history of genetics labs from the perspective of fruit flies, so both defamiliarization and tangible rewards result from the analysis of not letters but corresponding, and not scientific associations but associating. Or again, even though focused on a single figure, *Imperial Nature* differs in every way from, for instance, Robert J. Richards's monumental *The Tragic Sense of Life: Ernst Haeckel and the Struggle over Evolutionary Thought* (2008)—giving us, in essence,

the career of a single scientist as an occasion for the history of science rather than, as in Richards's case, the history of science as biography. For all its revelations, however, some significant things go missing: namely, what the gerunds crowd out, which is to say substantives such as friendship, loneliness, ambition. All of these appear but often seem, as it were, peripheral. Indigenous peoples and colonized populations, too, are almost entirely absent—"colonial" in the book refers to settlers.

But this may simply go to show that nobody can do everything, and that every methodology has its blind spots. More remarkable is how much *Imperial Nature* actually accomplishes—and, to return to *Darwin, Literature, and Victorian Respectability* and *Trying Leviathan*, how complementary the three approaches on offer end up being. I have stressed their differences, noting the triumphs and pitfalls of Dawson's attention to tactics, Burnett's to groups, and Endersby's to practices. But each book also incorporates aspects of the approaches of the others. Rather than signaling a rudderless eclecticism, such a synthetic approach looks very much like an emerging consensus as to the most productive ways to do science studies.



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