History Naturalized

BY HENRY M. COWLES*

MELINDA BALDWIN. *Making* Nature*: The History of a Scientific Journal*. Chicago and London: University of Chicago Press, 2015. 309 pp., illus., bibl., index. ISBN 978-0-226-26145-4. $45.00 (hardcover).

GOWAN DAWSON and BERNARD LIGHTMAN, Eds. *Victorian Scientific Naturalism: Community, Identity, Continuity*. Chicago and London: University of Chicago Press, 2014. viii + 345 pp., illus., bibl., index. ISBN 978-0-226-10950-3. $45.00 (hardcover).

BERNARD LIGHTMAN and MICHAEL S. REIDY, Eds. *The Age of Scientific Naturalism: Tyndall and His Contemporaries* (Science and Culture in the Nineteenth Century, 24). London: Pickering and Chatto, 2014. xv + 256 pp., index. ISBN 978-1-848-93463-4. $99.00 (hardcover).

MATTHEW STANLEY. *Huxley's Church and Maxwell's Demon: From Theistic Science to Naturalistic Science*. Chicago and London: University of Chicago Press, 2015. 336 pp., bibl., index. ISBN 978-0-226-16487-8. $45.00 (hardcover).

The greatest trick the naturalists ever pulled was convincing the world there was no other way to do science. Naturalism—or "scientific naturalism," as it was first known—constitutes a double claim about science and nature. First, scientific naturalists hold that the only proper subject of scientific inquiry is the natural world. This view about the scientific method and how to use it has come to be called "methodological naturalism." Second, scientific naturalists insist that nature contains only things that can be subjected to science. This view about the natural world and what is in it is called "ontological

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naturalism." There are various ways of articulating the relationship between these—and other—varieties of naturalism, but the thing to note is that both methodological and ontological naturalism blur the boundary between science and nature. All science is natural; all nature is scientific. On this view, "scientific naturalism" is a tautology. What other name could there be for naturalism; what other species of science might exist?

This tautology was hard won. Victorian naturalists such as Joseph Hooker, John Tyndall, and Thomas Henry Huxley hitched the scientific method to the natural world in order to make a living (and a name) as men of science. By linking science and nature in this way—by conflating methodology with metaphysics—scientific naturalists narrowed the gap between how and what one could know. The enemy was obvious. "From the earliest times of which we have any knowledge," wrote Huxley in 1892, "Naturalism and Supernaturalism have consciously, or unconsciously, competed and struggled with one another."[1] The so-called Conflict Thesis, credited to John William Draper and Andrew Dickson White, made warfare between naturalism and supernaturalism seem inevitable by the end of the Victorian Era.[2] The naturalists used this idea of perennial conflict to their advantage, insisting that alternative ways of knowing stymied the pursuit of truth. As a result, science was naturalized. It was made to seem like the only way to know nature. In the process, naturalism itself came to seem, well, natural.

Now, historians are undoing all that. A raft of recent work shows just how much effort went into naturalizing naturalism in the Victorian era. In particular, these historians have recovered the sense in which "naturalism" was an actor's category in the nineteenth century, the meaning of which was forged and fought over alongside major developments in the history of science and in British history more generally. No longer can we accept "science became naturalistic" as an analytical description of Victorian intellectual history. Instead, as these books demonstrate, the ideas and infrastructure of modern science—from its means of communication to its underlying values—arose in tandem with the naturalists' commitments. At every step, things might have

1. Thomas Henry Huxley, *Essays Upon Some Controverted Questions* (London: Macmillan and Co., 1892), 4–5.

2. The "Conflict Thesis" is usually credited to a pair of books published in the 1870s. See John William Draper, *History of the Conflict Between Religion and Science* (New York: D. Appleton & Company, 1874); Andrew Dickson White, *The Warfare of Science* (New York: D. Appleton & Company, 1876). For a recent treatment of this narrative, see Peter Harrison, *The Territories of Science and Religion* (Chicago, London: The University of Chicago Press, 2015), 172–82.

been otherwise. But they were not, and so here we are. Naturalism was the product of a particular period, but it may well have been *the* product of that period. It gave rise not only to new ideas about the scientific method, but also to more general ways of thinking about agency and evidence and truth that are still with us. In a sense, we are all naturalists now.

To see why, we must pay the Victorians a visit. Accounts of scientific naturalism almost always begin in the nineteenth century, when certain British men of science started calling themselves "scientific naturalists." Frank Turner provided the classic account of this process, arguing in 1974 that the first generation of naturalists aligned themselves against religious belief in general and natural theology in particular as a means of claiming intellectual and cultural authority.[3] For Turner, conflict was key. His view is even clearer in an essay, published some years later, entitled "The Victorian Conflict Between Science and Religion":

> Positivist epistemology provided an intellectual solvent to cleanse contemporary science of metaphysical and theological survivals. By excluding the kinds of questions as well as the answers that might arise from theological concerns, it also served to discredit the wider cultural influence of organized religion. Intellectual and social advance went hand in hand.[4]

In other words, philosophical arguments were tools for social striving. Naturalism was put to work in intellectual turf wars, finding acceptance as its adherents won victories.

For a new generation of scholars, however, this story—Turner's story—is too neat. Take *Victorian Scientific Naturalism: Community, Identity, Continuity*, a wonderful volume (dedicated to Turner) of probing essays that engage deeply and often critically with previous scholarship. In their introduction to the volume, editors Gowan Dawson and Bernard Lightman insist that "the contest for cultural authority was actually far more complex than Turner had imagined" (14). Michael Reidy's analysis of the role of mountaineering in naturalism's ascent is a case in point. Huxley quivers over a frozen abyss; Tyndall must "grapple with the mystery beyond life" (62). Naturalism answered "the questions that mountains force them to ask, whether through beauty or desolation, order or chaos" (74). As Tyndall put it: "There is assuredly morality in the

3. Frank M. Turner, *Between Science and Religion: The Reaction to Scientific Naturalism in Late Victorian England* (New Haven, CT: Yale University Press, 1974).

4. Frank M. Turner, "The Victorian Conflict between Science and Religion: A Professional Dimension," *Isis* 69, no. 3 (1978): 356–376, on 364.

oxygen of the mountains" (70). Reidy's mountaineers, like many other naturalists, found nature to be moral and material at once; conflict fails to capture the naturalists' experience, at altitude or otherwise.

So where do we get the idea that naturalism disenchanted the world? From the naturalists themselves, it turns out. For all their spiritual strivings, these men of science were a brash bunch. Huxley's iconic encounter with Bishop Samuel Wilberforce at the 1860 meeting of the British Association for the Advancement of Science (BAAS) is just the most famous example. The history of the period is replete with others. Take Tyndall's infamous speech before the BAAS in 1874, now known simply as the "Belfast Address." This was scientific naturalism at its most strident:

> All religious theories, schemes and systems which embrace notions of cosmogony, or which otherwise reach into the domain of science, must, *in so far as they do this*, submit to the control of science, and relinquish all thought of controlling it.[5]

Here is the prescriptive corollary of Huxley's descriptive binary. In both, rhetorical force stems from an either-or construction that effectively obscures complexity and dissuades waffling. These are exactly the kinds of remarks that fueled the fire of the Conflict Thesis.

One of the highlights of *Victorian Scientific Naturalism* is George Levine's meditation on how paradoxical this all is. The contrast between Tyndall's Alpine reveries and his Belfast address is but one example of naturalism's double-speak. The very prose naturalists used to inveigh against religious meddling in science was shot through with religious rhetoric and claims to moral superiority. Although "the naturalists were fully aware that their antimetaphysical stance, and the work of science, were dependent on metaphysically unprovable assumptions" (85), they seemed to square the circle with flights of imagination and poetry. Comparing Tyndall's writing to George Eliot's *Middlemarch*, Levine shows how both authors characterized the ordeals of everyday scientific labor—scholars, doctors, and men of science confronting difficult, perhaps unresolvable problems—as the effort to transform "the material into the spiritual" (83). Both the naturalist and the novelist frame the scientific enterprise as the paradoxical search for spiritual significance in a world that men of science increasingly insisted was devoid of spiritual forces.

5. John Tyndall, *Address Delivered Before the British Association Assembled at Belfast* (London: Longmans, Green, and Co., 1874), 61.

Some naturalists confronted this paradox head-on. Huxley, for one, admitted to holding *a priori* assumptions: the world exists, causes produce effects, the laws of nature hold, and so on. "The validity of these postulates," Huxley wrote, "is a problem of metaphysics; they are neither self-evident nor are they, strictly speaking, demonstrable."[6] The point was that such quandaries were unavoidable. What mattered was how one acted in light of them, either to limit their effects or to own them up front. "Paradox," Levine concludes, "is the dramatic force of the naturalists' epic of the march to truth over the corpses of dead beliefs in transcendental power" (95). But we might see Huxley's confession—as well as his later meditations in *Evolution and Ethics*—less as *submitting* to such a paradox than *naturalizing* it. This would not, Huxley recognized, free him from the "problem of metaphysics" he and others confronted. But by excusing his assumptions in this way, he drew on the very explanatory mode he was trying to defend. In effect, Huxley naturalized naturalism, a point to which I return below.

This naturalization did not occur in a vacuum. Nor, indeed, was naturalism so different from the alternatives opposed by its champions. In *Huxley's Church and Maxwell's Demon*, Matthew Stanley incisively exhibits the shared commitments of "naturalistic" and "theistic" science. Though set against one another by figures on both sides, these two ways of knowing were rooted in a common substrate of assumptions and values, a fact that further complicates the Conflict Thesis. Stanley insists that these supposed enemies shared a broad set of what he calls "valence values"—agreed-upon principles about matters of evidence, verification, trust, diligence, and so forth. Similar to what Lorraine Daston and Peter Galison call "epistemic virtues," Stanley's "valence values" operate behind the historical scenes, only surfacing when a genuine disagreement emerges about their nature or propriety.[7] Such disagreements, we are led to believe, were (and are) rare. The foundations of scientific knowledge go unquestioned surprisingly often, which makes Stanley's lucid historical account all the more impressive.

How do such shared assumptions work? One central to Stanley's analysis is the idea of the uniformity of nature, which he calls "the core of what it meant

6. Thomas Henry Huxley, "The Progress of Science [1887]," in *Method and Results: Essays* (London: Macmillan and Co., 1893), 42–129, on 61; quoted by Levine on 85.

7. On "epistemic virtues," see Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007), esp. 39–42. Stanley began his analysis of "valence values" in an earlier book. See Matthew Stanley, *Practical Mystic: Religion, Science, and A. S. Eddington* (Chicago: University of Chicago Press, 2007), 6–7.

to do Victorian science" (6) for naturalists and theists alike. The question, for Stanley, is: "How can it be that uniformity was seen as rooted in theism in the early Victorian period, when it was presented as an enemy of theism by the end" (35)? The answer lies in how one interprets the principle of uniformity's main claim: that the natural world is governed by unerring laws. In the 1830s, it was obvious to most men of science that the existence of such laws required the existence of a law-giver (or at least an enforcer). Some, like James Clerk Maxwell, took uniformity so seriously that they sought to unify diverse laws under a single theory. Huxley turned this logic on its head by insisting that, as Stanley puts it, divine "disruptions and interference violated uniformity, that basic premise which made it possible to understand the natural world" (53). Theists like Maxwell and naturalists like Huxley both believed in uniformity. What they disagreed over was its nature.

In the end, according to Stanley, "Huxley won. Modern science is practiced naturalistically, and most scientists would be baffled to think that there was any other way" (242). Theistic practitioners, such as there are, usually consign themselves to a kind of split universe, something like Stephen Jay Gould's "nonoverlapping magisteria."[8] How did this happen? The same way Huxley evaded the paradoxes elucidated by Levine: through naturalization itself. "In order for the scientific naturalists to dominate," Stanley writes, "they had to make their view of science seem obvious and inevitable" (248). This was accomplished, in part, through writing history. Huxley, Tyndall, and others rewrote the history of science as if naturalism had been there from the start. "By naturalizing theistic science," Stanley concludes, Huxley "was able to argue that science had *always* been naturalistic" (256). It is not enough to say, as we often do, that history is written by the winners. Winning comes through historicizing.

The naturalists also seized the means of knowledge production. In the Victorian period, this increasingly meant seizing the means of publication. Alex Csiszar has argued that it was at precisely this moment that scientific authority became conflated with scientific authorship, that intellectual priority shifted from priority of discovery to priority of publication.[9] In *Making* Nature: *The History of a Scientific Journal*, Melinda Baldwin beautifully traces the journal

8. Stephen Jay Gould, "Nonoverlapping Magisteria," *Natural History* 106 (March 1997): 16–22.

9. See Alex Csiszar, "Objectivities in Print," in *Objectivity in Science*, ed. Flavia Padovani, Alan Richardson, and Jonathan Y. Tsou, Boston Studies in the Philosophy and History of Science, vol. 310 (Springer International Publishing, 2015), 145–169. See also Alex Csiszar, "Seriality and the Search for Order: Scientific Print and Its Problems During the Late Nineteenth Century," *History of Science* 48, no. 161 (2010): 399–434.

Nature from its Victorian origins to the present, showing how this happened on the ground. Early on, Huxley was an enthusiastic supporter of *Nature* because its editor, Norman Lockyer, shared his distaste for the way "many science journalists . . . wove theological overtones into their writings" (27). This antitheism was a main reason for Huxley and other naturalists' early support of the journal. Over the next few decades, *Nature* became central to the policing of "the qualities and background necessary to be a 'man of science'" (75).

Publications, and *Nature* in particular, came to stand in for science in ways that opened the journal up to critique. For example, Baldwin quotes Tyndall upbraiding Lockyer:

> Having opened your columns to attack you are, of course, in duty bound to open them to reply, but if I might venture a suggestion, you would wisely use your undoubted editorial rights, and consult the interests of science, by putting a stop to proceedings which dishonor it. (42)

This conflation of *Nature* and science mirrors, in certain ways, the collapse of nature and science toward which the naturalists were working. Gradually, men of science "adopted *Nature* as their primary forum for debating scientific theories in Great Britain and slowly began the practice of sending a short notice to *Nature* to announce a forthcoming paper in another journal" (54). The journal became a venue in which knowledge claims were both established and contested. As Baldwin skillfully shows, the scientific naturalists laid claim to nature by laying claim to *Nature*.

Publication was not the only, or even the primary, mode of scientific writing in Victorian Britain. That distinction belongs to correspondence. Projects dedicated to collecting, editing, and publishing the letters of Victorian men of science are essential to writing their history, not least because of the sheer volume of letters such figures wrote and received. Through correspondence, we can reconstruct the intellectual and social networks that constituted emerging fields and the new philosophies, like scientific naturalism, that arose alongside them. A wide-ranging volume entitled *The Age of Scientific Naturalism: Tyndall and His Contemporaries* takes this up largely by showcasing the fruits of the ongoing John Tyndall Correspondence Project. In an expansive introduction, Michael Reidy insists that letters elucidate a range of themes, including "private versus public knowledge, the boundary making process, and the culture of debate" (10).

Janet Browne's chapter on "Corresponding Naturalists" is a manifesto on this point. Letters were how most scientific work was communicated; they were how authors tried out new ideas and learned about those of others. As

Browne points out, letters were "one of the main ways that scientists collected, processed, and disseminated data" (158). Calling for a "correspondence history" to parallel (for example) "book history," Browne insists that such an approach would reveal the interpenetrations of the life of the mind and the lives of the ink, paper, and trains on which it depended. When Darwin bragged about backgammon to a botanist, or Tyndall wrote a friend for a fact, we can catch the social construction of science in action. Correspondence, Browne concludes, was "an infrastructure that participated in shaping modern scientific society" (169). When it comes to the sociology of scientific knowledge in the nineteenth century, the rubber hits the road when the ink hits the stationery.

Inundated by email as we are today, it can be hard to reckon with the role letter-writing played for the naturalists. What did such materials accomplish, and what, in turn, can we learn from them? Then, as now, correspondence served many functions. Letters were used for formal and informal purposes; you wrote them to friends and to enemies, expressed private doubts and made public pronouncements. In her essay in the volume, Baldwin suggests that letter-writing became a kind of identity for some. George Gabriel Stokes, editor of the *Philosophical Transactions of the Royal Society*, became a "Victorian correspondent," a move Baldwin likens to a "decision to pursue administration" (185) over research. In another chapter, Jonathan Smith uses the ornithologist Alfred Newton's letters as evidence of a particular kind of scientific self-fashioning. Newton wrote letters to curry favor—for example, by "offering to share with Darwin the foot of a partridge with a large ball of clay attached" (145)—and to seek endorsements. Here, as elsewhere, letters seem to reveal both the private and the public sides of the scientific life.

Letters do have their limits. There is a sense in which we, as historians, risk naturalizing their role in the production and dissemination of scientific knowledge in the nineteenth century. The four books reviewed here rely, as do almost all works on Victorian science, on our ability to glean personal relationships and private views from the letters we find in archives. Just as men of science themselves supplemented published material with personal correspondence in myriad ways, we too must be careful to balance our accounts. Does the preservation of paper prove that the world of Victorian scientific naturalism was "flat," that its networks easily criss-crossed the country? Of course not. Private parties and supper clubs, elite institutions and personal spats gave shape to science, philosophy, and much else in ways that letters capture only in part. Not all letters were read, or even received; those that were might have been

skimmed or ignored or misunderstood. Connections in correspondence are as hypothetical as any others we recover.

In the end, this history feels familiar because naturalism is still with us. As Stanley and others point out, the victories won by the Victorian scientific naturalists over what we can know and how we can know it went on to shape the disciplines, universities, and funding patterns that took hold over the twentieth century and continue to govern what counts as knowledge today. Having an impact on other scientists (and receiving a scientific salary oneself) still depends on demonstrating the right kind of values and publishing in the right kinds of places. Sure, certain features of today's scientific life were either absent or only just emerging in the late nineteenth century. From peer review and replication studies to the statistical manipulations and imaging technologies on which much science today depends, a lot has changed since Huxley and Tyndall made their names as naturalists. And yet, there is a sense in which much that came after them has been shaped by—and indeed, carries on—the legacies of all the hard work that went into making Victorian scientific naturalism. Through their labor, naturalism came to seem natural.

Most striking for the historian is naturalism's legacy in our own discipline. Steven Shapin insists that most of us are naturalists without knowing it. In a recent collection called *Never Pure*, he offers—as his comically long subtitle puts it—*Historical Studies of Science as If It Was Produced by People with Bodies, Situated in Time, Space, Culture, and Society, and Struggling for Credibility and Authority*. Shapin would have us treat Huxley the way Huxley treated primates—as one more organism in an environment. Science is just like any other behavior. Shapin calls this approach "historical naturalism" and argues that what was once heresy is now dogma. Historical naturalism, he suggests, is now "just-what-it-is-to-do-history-of-science."[10] If Shapin is right that there is really *no other way* to write history (of science) today, then the victories recorded by Stanley and others run even deeper we thought. Historical naturalism, like the scientific naturalism that preceded it, has been naturalized.

So what? Is there anything wrong with naturalism? Not on its face. But if we follow Shapin and make it explicit, then we can engage with the promises and pitfalls of our naturalism more seriously. One way to do so is to follow Huxley and grab the bull by the horns. Historical naturalists explain behaviors—so

10. Steven Shapin, *Never Pure: Historical Studies of Science as If It Was Produced by People with Bodies, Situated in Time, Space, Culture, and Society, and Struggling for Credibility and Authority* (Baltimore: Johns Hopkins University Press, 2010), 14, 6.

why not work with behavioral scientists to do so? In the case of the history of science, working with psychologists is an obvious starting point. This is exactly what Willard Van Orman Quine advocated in his famous essay, "Epistemology Naturalized." Psychology helps, Quine argued, but only when we acknowledge our naturalistic aims:

> If all we hope for is a reconstruction that links science to experience in explicit ways short of translation, then it would seem more sensible to settle for psychology. Better to discover how science is in fact developed and learned than to fabricate a fictitious structure to a similar effect.[11]

The integration of historical and psychological naturalism can help account for those cognitive aspects of science that are often hidden from view. Although recent efforts in this direction have met with criticism, such collaborations remain a way to renew naturalism's promise.[12]

Another way to reckon with naturalism is to reverse its logic. Victorian scientific naturalists built theory out of method, redefining science as natural and rewriting nature in light of it. Might we work the other way, rethinking (historical) method in light of (new) theories? Various efforts, from Bill Brown's "thing theory" to the "historical ontology" of Ian Hacking, point in this direction.[13] Another, more radical approach would be to rethink all of our histories as "natural histories." Rather than historicize naturalism, as the authors of these recent books have done, we might naturalize historicism, working with psychologists and others to understand our actors in new ways. Naturalization is tricky, not least because it purports to account for itself. But, as Shapin suggests, we are already doing it. In the absence of grand theory (recent manifestos notwithstanding), history is already naturalized.[14] The question now is: what next?

11. W. V. Quine, "Epistemology Naturalized," in *Ontological Relativity, and Other Essays* (New York: Columbia University Press, 1969), 69–90, on 78.

12. For examples of such attempts and of their critics, see the recent Focus section on "Neurohistory and History of Science" in *Isis* 105, no. 1 (2014): 100–154.

13. On "thing theory," see Bill Brown, "Thing Theory," *Critical Inquiry* 28, no. 1 (2001): 1–22. On "historical ontology," see Ian Hacking, *Historical Ontology* (Cambridge, MA: Harvard University Press, 2002). See also Annemarie Mol, "Ontological Politics. A Word and Some Questions," *The Sociological Review* 47, no. S1 (1999): 74–89.

14. See, for example, the call for "big history" in Jo Guldi and David Armitage, *The History Manifesto* (Cambridge: Cambridge University Press, 2014). See also the exchange in *The American Historical Review* 120, no. 2 (2015), 527–554.