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The “history” of Victorian scientific naturalism: Huxley, Spencer, and the “end” of natural history



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ABSTRACT

As part of their defence of evolutionary theory, T. H. Huxley and Herbert Spencer argued that natural history was no longer a legitimate scientific discipline. They outlined a secularized concept of life from biology to argue for the validity of naturalism. Despite their support for naturalism, they offered two different responses to the decline of natural history. Whereas Huxley emphasized the creation of a biological discipline, and all that that entailed, Spencer was more concerned with constructing an entire intellectual system based on the idea of evolution. In effect, Spencer wanted to create a new scientific worldview based on evolutionary theory. This had consequences for their understanding of human history, especially of how science had evolved through the ages. It affected their conceptions of human agency, contingency, and directionality in history. Examining Huxley's and Spencer's responses to the “end” of natural history reveals some of the deep divisions within scientific naturalism and the inherent problems of naturalism in general. Whereas Huxley chose to separate the natural and the historical, Spencer opted to fuse them into a single system.

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For the historian of modern science, the nineteenth century was particularly significant due to two interconnected developments. First, during the nineteenth century, biology became a legitimate scientific discipline. In this new discipline, the study of life was stripped of any theological content. Second, the secular basis of biology was provided by evolutionary theory. Thomas Henry Huxley, the biologist, and his friend Herbert Spencer, the “philosopher of evolution,” were at the center of these developments. They were part of a group, referred to by historians as “scientific naturalists,” who first became an influential force within British science in the middle of the nineteenth century. Huxley's historical account of the origins of the term “biology” in his essay “On the Study of Biology” (1876) was totally in line with his role as champion of scientific naturalism. Dramatically proclaiming the end of natural history, Huxley concluded that it had been a victim of its own success. The “marvelous progress” of the subjects that were an integral part of natural history, such as physical geography, geology,

mineralogy, the history of plants, and the history of animals, at the “latter end of the last and the beginning of the present century,” led “thinking men” to realize that “very heterogeneous constituents” had been included “under this title of ‘Natural History’” (1894b, 266–67). Geology and mineralogy, for example, were “in many respects widely different from botany and zoology” (267). It was possible to “obtain an extensive knowledge of the structure and functions of plants and animals, without having need to enter upon the study of geology or mineralogy and *vice versa*.” Moreover, “as knowledge advanced,” it was realized that botany and zoology were very closely allied since they both dealt with living beings. They could therefore be united “into one whole” and dealt with “as one discipline” (267).

According to Huxley (1894b, 268), the idea of uniting the sciences concerned with “living matter” first occurred to three men at the beginning of the nineteenth century: the French zoologist Jean-Baptiste Lamarck, the German naturalist and botanist Gottfried Reinhold Treviranus, and the French anatomist and physiologist Marie-François Xavier Bichat. Huxley impressed upon his readers how “wonderful” it was that men who had not been in

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communication with each other were considering the conception of a new scientific discipline at about the same time. In Huxley's estimation, Bichat was the least important. But he had assumed "the existence of a special group of 'physiological' sciences" in his *Anatomie générale* (1801). Lamarck had been the first to use the term "biologie" in 1801 in his *Hydrogéologie*. Treviranus's contribution was the most critical of all, as he was the first to work out completely the conception of biology as a separate discipline in 1802, when he published the first volume of his *Biologie*. "That is the origin of the term 'Biology,'" Huxley declared. And it had led to the adoption by "all clear thinkers and lovers of consistent nomenclature" of the term "biology" to denote the "whole of the sciences which deal with living things, whether they be animals or whether they be plants." Only the muddled thinkers and lovers of inconsistent nomenclature retained "the old confusing name of 'Natural History,'" which had "conveyed so many meanings." Huxley's account of the origins of biology banished natural history to the dustbin of history.

Huxley and the other scientific naturalists had defended Darwin in the controversies following the publication of the *Origin of Species* (1859), and it served their purposes to draw on a secularized concept of life from biology to argue for the legitimacy of Darwin's naturalistic theory. In this chapter, I will analyze the two different responses by scientific naturalists to the decline of natural history. Whereas Huxley emphasized the creation of a biological discipline, and all that entailed, Spencer was more concerned with constructing an entire intellectual system based on the idea of evolution. In effect, Spencer wanted to create a new scientific worldview based on evolutionary theory. This had consequences for their understanding of human history, especially of how science had evolved through the ages. It affected their conceptions of human agency, contingency, and directionality in history. Examining Huxley's and Spencer's responses to the "end" of natural history reveals some of the deep divisions within scientific naturalism and the inherent problems of naturalism in general. Whereas Huxley chose to separate the natural and the historical, Spencer opted to fuse them into a single system.

1. The "end" of natural history

As a discipline, natural history involved the systematic investigation of animals, plants, and minerals with the aim of uncovering their overall order. Order was revealed through the method of describing, collecting, identifying, classifying, utilizing, and displaying nature. Natural history was one of three disciplines. The other two were natural philosophy and civil history. Natural history had a lower status than natural philosophy, which surpassed it in explanatory power. Natural history was also distinguished from civil history, the history of the voluntary actions of men in commonwealths (Harrison, 2011, 132). From its revival in the sixteenth century to its decline in the nineteenth century, natural history played a key role in the understanding of the natural world. During this period, when European powers explored exotic regions of the world, ships returned with specimens that had been previously unknown. Fitting new specimens into a larger scheme of things was the job of the natural historian. For many natural historians, the order they sought to detect was unambiguously divine. Natural history was viewed in the early modern period, as Peter Harrison (2011) has asserted, as "an intrinsically theological activity" (131). Some natural historians even attempted to combine the natural history of the Earth with the sacred chronology of the Bible (135). Natural history was far more than just a discipline. It provided meaning and structure to the natural world.

Historians of science agree that natural history was an important discipline from the sixteenth to the nineteenth centuries.

However, there is some disagreement as to what happens to natural history after the nineteenth century. John Pickstone has argued that natural history was the dominant "way of knowing" during the early modern period. He declares that it was replaced at the end of the eighteenth century by an analytical way of knowing, which itself was superseded by the experimental way of knowing by the middle of the nineteenth century. But for Pickstone natural history does not disappear in the nineteenth century, since the museum is such an important scientific institution in this century (Pickstone, 2000, 73). This is in line with Pickstone's idea that all ways of knowing continue to exist and exert influence even after they are no longer dominant. Although Harrison treats natural history as a discipline rather than a formative way of knowing like Pickstone, he sees natural history as being replaced in the nineteenth century by the new scientific biology while continuing to live on in the twentieth century in scientific creationism, evolutionary psychology, ecology, and the popularization of science (Harrison, 2011, 142). Paul Farber is less willing to accept the idea of a decline of natural history in the nineteenth century. He insists that 1880–1900 was the golden age of natural history, when many natural history museums—such as the British Museum (Natural History), which opened in 1881—were constructed and old museums were expanded. Celebrated zoological and botanical gardens, he points out, only came into their own in the nineteenth century. Moreover, natural history books commanded a large audience in this period (Farber, 2000, 87–88, 94, 97). Farber also believes that natural history played a crucial role in the development of modern evolutionary theory. "Far from entering a period of decline," he insists, "natural history provided the basis for the principal theoretical synthesis of the life sciences in the twentieth century," though he acknowledges that large portions of the academic world considered it "old-fashioned" (2000, 98–99).

Despite the disagreement on what happened to natural history in the twentieth century, Pickstone, Harrison, and Farber concur that its status changed during the nineteenth century. Spencer and Huxley belonged to a group that attempted to take advantage of the changing fortunes of natural history. Taking into account the social dynamics within mid-Victorian science is crucial to comprehending why Spencer and Huxley rejected natural history. When their generation of scientific practitioners arrived on the scene at the mid-point of the century, a changing of the guard took place within the scientific leadership. Many of the younger scientists, including Huxley, were outsiders. Huxley was trained at a medical school run by non-Anglicans. The older generation of scientists, men such as William Whewell, John Herschel, and William Buckland, were educated at Anglican Oxford or Cambridge, and they had insisted that knowledge of nature was to be conceived within a religious framework shaped by natural theology. Huxley, Spencer, and their friends aimed to secularize nature, promote expertise, and obtain independence for scientific investigators from theological dogma. They argued that proper science excluded any reference to a divine being—scientists should stick to studying observable causes and effects in nature rather than offering explanations dependent on the notion of a designing creator. Natural history, with its connection to natural history and the sacred record, was not considered by them to be truly scientific. The scientific naturalists worked to undermine its credibility. Huxley's account of the origins of the term "biology" was intended to proclaim the end of natural history. In sum, the scientific naturalists pushed for a redefinition of science in the latter half of the nineteenth century that left natural history behind. They used the controversy over Darwin's *Origin of Species* as an occasion to champion a naturalistic approach to conducting scientific research. The ranks of scientific naturalists included the physicist John Tyndall, the mathematician William Kingdon Clifford, the founder of eugenics Francis Galton, the statistician Karl

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