A Quest for Preeminence

The Launching of Modern American Science, 1846–1876. ROBERT V. BRUCE. Knopf, New York, 1987. x, 446 pp. + plates. $30. The Impact of the Civil War.

The phenomenal success of science in the United States during the last hundred years has perhaps led many Americans to forget that their nation has not always been a leader in that field. But even as late as the 1850s American scientists themselves knew that the German states, France, and the United Kingdom were the leaders in science. They accepted that fact reluctantly, however, for, like their compatriots in business, industry, and politics, they desired to take a back seat to no other nation. Their efforts to make America a leader in science were deterred by a civil war, rivalry among themselves, and generally poor public support. By the late 1870s, however, science in America had advanced significantly and commanded respect in Europe.

This is the story related ably by Robert Bruce in *The Launching of Modern American Science, 1846–1876*. It is a fascinating story in which we witness the slow but steady development of scientific organizations, the generally successful role of government-sponsored surveys and expeditions, changes in the college and university curriculum, and, above all, the energetic efforts and powerful influence of a handful of men devoted to the professionalization of science. The small group of scientists who played a crucial part in the launching of modern science in the United States come to life in this volume. Bruce is keenly aware that individuals alone do not shape the course of history, and so he also discusses the cultural phenomena and historical events that influenced the transformation of science in the United States. But he understands and fully explains how a few prominent men charted the course of science in America and sought to direct it into the channel of professionalization.

The role of Alexander Dallas Bache in forming this elite corps of "professional" scientists, or the "Lazzaroni," comes through clearly in Bruce's account. The author also paints a vivid picture of the activities and views of other members of the "inner circle," including Joseph Henry, Benjamin Peirce, Wolcott Gibbs, James Dwight Dana, and Benjamin Gould. In addition, he discusses the ideas of those who opposed elitism, including Asa Gray and William B. Rogers, and he shows the importance of the independent workers, such as James Hall and Spencer Baird. Lesser-known but nonetheless accomplished men also appear in this informative account. And, of course, Bruce ranks the influential Louis Agassiz among the giants of American science. Indeed, the Swiss immigrant earned a peculiar place in the annals of American science, on the one hand promoting the enterprise through his frequent and popular lectures and his fund-raising efforts, and on the other hand hindering it by his adamant commitment to theological tenets rather than to principles of open inquiry.

Although Agassiz advocated going beyond the collecting of specimens and beyond systematics, he remained bound to the Baconian philosophy that shunned hypothesizing, and he constantly touted his view that the primary purpose of science was to discover the laws of God. Thus, despite the strong arguments of Gray and Rogers for the Darwinian view, he clung to the notion that new species appeared in special acts of divine creation. But, then, only a few American intellectuals readily accepted the theory of evolution when it first gained notice, and even they found it hard to give up the idea of "purpose" in natural development. When the theory of evolution did at last gain wider acceptance in the United States, it was in the form of Neo-Lamarckism rather than natural selection.

In a smoothly flowing story, Bruce traces the developments in physics, mathematics, and astronomy, which generally remained far behind those in Europe until late in the 19th century. He also discusses the rise of interest in chemistry and shows that, with the notable exception of research by Gibbs, America also lagged behind in that field. In fact, as Bruce demonstrates by both statistical and documentary evidence, natural history and geology dominated American scientific interests in this formative period. For a number of reasons the majority of American scientists were devoted more to the study of the natural world than to the physical sciences, but certainly the American penchant for utility and applied science was one of the factors that led to the dominance of interest in America's natural history. A desire to exploit the nation's natural resources and to identify the best paths for railroads resulted in government-sponsored geological surveys and expeditions.

But the great American expeditions also brought profit to the sciences of geology and biology, to civil and mining engineering, and to oceanography. Politically astute and clever, the U.S. Coast Survey director Alexander Dallas Bache realized the benefits of the expeditions to science, and he took advantage of every opportunity to use them to advance the cause of science. As Bruce notes, other developments also helped transform science in America. These include the growth of centers of scientific activity, chiefly Boston, followed by Philadelphia (previously the leader) and New York; the gradual but increasingly important maturation of national scientific organizations; and, mainly after the Civil War, a strong emphasis on science in American colleges and universities, which had previously done little more than support professors of science by paying them (poorly) for teaching. Removal of the gender barrier came very slowly, however, and, as Bruce aptly indicates, male scientists would not allow the few female scientists to enter their ranks.

Drawing upon an enormous number of primary sources and scores of secondary works, Bruce has produced a truly important book. His incisive analyses, his exemplary style of writing, and his graceful touches of humor make it a fascinating one. Perhaps the main shortcoming of the work is that it contains too little information about scientific developments in the Midwest and in the South. Of course, the heart of the story lies in the Northeast, but some good scientific activity was also occurring elsewhere. Bruce mentions several southern scientists, but neglects others who made important contributions. Moreover, he offers no character sketches of leading southern scientists, with the exception of the erratic Matthew Maury. In some instances he even has his facts wrong. For example, he says that John Bachman was "Pennsylvania-raised," when in fact the able naturalist was born and reared in New York. He also implies that John McCrady was associated with South Carolina College. Actually, the brilliant if highly eccentric McCrady, a favorite student of Agassiz, was on the faculty of the College of Charleston, a small institution that deserves greater mention for its place in science than Bruce gives it. In addition, Bruce first places Agassiz in Charleston in 1850, when in fact he had been there earlier. Then he gives Agassiz greater credit than he probably deserves for "stirr[ing] the [Charleston] museum." Indeed, Agassiz only lent his support to an effort that was already well under way.

As Bruce fully explains, Charleston and the South as a whole lagged considerably behind the Northeast in scientific advancement before the Civil War. Yet it is stretching the point to call that region "scientifically benighted." Certainly Bruce understands the barriers to scientific advancement in the South, and he provides an enlightening analysis of the problems in that region. He also understands and effectively explains how the Civil War virtually wrecked the scientific enterprise in the South and made recovery impossible for several decades to come. His omissions and errors about science in the South do not significantly detract from the overall quality of this splendid book.

The Launching of Science in Modern America fills a gap in our knowledge of the history of science in the United States and deserves the attention of everyone who desires to know when and how modern science fledged in America.

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Theories of Human Diversity

Victorian Anthropology. GEORGE W. STOCKING, JR. Free Press (Macmillan), New York, and Collier Macmillan, London, 1987. xviii, 429 pp., illus. $27.50.

This long-awaited work by America's leading historian of anthropology forges expansive overviews and detailed vignettes into an episodic account of 19th-century British theories of human nature and diversity. Its central concern is with the imperfectly consolidated ideas of sociocultural evolutionism formulated during what Stocking calls the "age of equipoise" by such key social thinkers as John Lubbock, Henry Maine, John McLennan, Herbert Spencer, and E. B. Tylor, among them the founders of professional anthropology in Britain. This tradition, also called by Stocking a "cynosure," never quite became a paradigm with normal science attached; its links with different forms of Darwinism remained complex and often inconsistent.

Stocking begins by tracing various forerunners of "classical evolutionism," which he declares a "kind of cosmic genealogy for middle-class civilization" (p. 233). In addition he pursues the aftermath of antievolutionary reactions and resistance to positivism, particularly in American anthropology, and provides in closing a "frankly sketchy panorama" of the discipline since 1880, accentuating developments in Boasian culturalism, British functionalism, and French structuralism based on shared assumptions of biological and psychic unity that had been doubted in an earlier polygenist racialism. Though the book occasionally alludes to sociobiology, its primary concern is with theories of social, cultural, linguistic, and physical diversity within the human species, the fundamental topic of mainstream modern anthropology.

Antecedents of Victorian anthropology delineated by Stocking in his opening chapter include Enlightenment notions of reason and progress, French comparative anatomy and attention to civilization's externals, German comparative philology and emphasis on inward culture, and British political economy in tune with Locke's natural harmony of human egoisms rather then Filmer's ideology of patriarchalism. Stocking clarifies important anticipations of Marxism among Scottish progressivists and the peculiar integration of evangelical and utilitarian impulses in pre-Darwinian Britain that accompanied the resurgence of Biblical traditions as a "kind of paradigmatic status" (p. 44).

A commitment to multiple contextualizations is apparent in the treatment of J. C. Prichard's ethnology, to which Stocking then turns. Taking shape on the eve of evolutionism and a dramatic reassessment of geological time, the Prichard school brought together Anglo-Saxonism and physical anthropology "founded on the Bible, conceptualized as a history of racial movements, and buttressed largely by the evidence of comparative philology" (p. 75). Its hereditarian racialism eroded Enlightenment assumptions of human uniformity yet resisted polygenism and managed to assimilate Max Müller's Indology and British antiquarianism. Stocking neatly encapsulates Prichard's biography: "Following a then well-traveled path from Quakerism to the Anglican church, Prichard had been touched by the Evangelical Revival while studying at Cambridge and Oxford after leaving Edinburgh, and his religious commitment would no more allow him to accept Kames' primitive polytheism than his aboriginal polygenism. . . . in defending both primitive revelation and human unity, he was in fact defending the principle that all mankind had once been and were rightfully subject to a single ethical dispensation" (p. 49). More might have been made of the relation of Prichardian ethnology to the popular movement of natural history and natural theology, a virtual cult of Linnean classification that pervaded scientific exhibitions, bourgeois parlor displays, and best-selling books of the period. Classifying and collecting according to what Michel Foucault has called the purely "visible" was displaced not just by intellectual Darwinism but by an overall shift of attention to subsurface order, the general "hidden."

Stocking provides provocative sketches of central figures and marginal ones, often grouped in threes: not just Lubbock, Tylor, and McLennan, but George Grey (benevolent colonial despot of New Zealand and South Africa), Thomas Williams (Methodist missionary to Fiji), and traveler-Darwinist Francis Galton. Although Stocking plots a history of influences and transmission of theories, he is alert to shortcomings in monolithic models of disciplinary advance. Thus in considering evidence accumulated on non-Western populations by administrators, travelers, and missionaries between 1838 and 1850 he characterizes the views he finds only as "attitudinal postures"—"ranging from a post-Enlightenment imperialist progressivism, to an evangelical monogenetic assimilationism, to a pessimistic racialist eugenicism, to a paradoxical polygenistic primitivism" (p. 80). Still, the book's continual cataloguing of competing isms suggests that description and explanation progressed in primarily doctrinal fashion, that ideas were basically partisan and polarized rather than dispersed. Stocking's strategy of looking backwards and forwards from classical evolutionism reinforces a centralizing tendency. His history remains canonical, although elaborately qualified.

Even familiar subjects are given a fresh look through this strategy: Darwin, of course, but also, more inventively, the Crystal Palace Exhibition of 1851, presented as a festival of colonialist representations and demarcations of peoples subject to British control. In taking the Crystal Palace as a focal point and closing his account with an emblematic story of the eradication of Tasmanians, Stocking situates both racial and cultural theories of human varieties in political and economic contexts, without necessarily reducing them to direct reflexes of policies of domination. Stereotypes of the "savage" and the "primitive" as counter, pawn, proxy, and foil are traced across transformations in ideology without sacrificing attention to institutional specifics. This is a rare achievement in the history of anthropological ideas.

The book has a generally chronological progression, yet it includes turns into "tangled interrelations" (p. 9). For example, not content simply to compare McLennan's influential "tracing up" of exogamous marriage practices and religious ideas to rival schemes of development, Stocking mentions the Matrimonial Causes Act, Book of Common Prayer rites, and other issues that gave the familiar debates relevance to contemporary affairs. Equally lively is a section on the