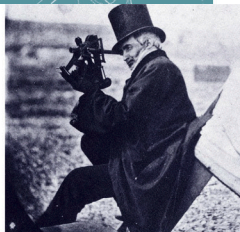


Axel Jansen

ALEXANDER DALLAS BACHE



*Building the American Nation through Science
and Education in the Nineteenth Century*

campus

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Chapter 1

Introduction

The Curious Case of Alexander Dallas Bache

In the history of American science, Alexander Dallas Bache (1806–1867), great-grandson of Benjamin Franklin, occupies a singular and unparalleled position. More than anyone else in his generation and in perhaps any generation before or since, he embodied the American scientific profession, directed its development, and shaped its institutions. Most major national scientific institutions and organizations between 1830 and 1865 relied on his support or leadership: In the 1830s, Bache was the principal organizer of Philadelphia’s Franklin Institute, then the most prominent research organization in the United States. In 1843, he became the superintendent of the U.S. Coast Survey, the country’s largest government-run scientific enterprise with more scientific employees than any other contemporary science-related institution including Harvard University. From 1847, Bache helped instigate and direct the American Association for the Advancement of Science (AAAS), the country’s first national platform for science. He was one of the regents of the Smithsonian Institution and helped secure the post of secretary (i.e. director) for his colleague Joseph Henry in 1846. Finally, Bache helped found the National Academy of Sciences and became its first president in 1863. In view of this ubiquitous role, A. Hunter Dupree considers him (with physicist Joseph Henry and geologist John Wesley Powell) among the three “great hierarchs of federal science” in the nineteenth century, and Robert V. Bruce has concluded that Bache spoke “more authoritatively for antebellum science than anyone else.”¹

¹ Quotes from Robert V. Bruce, *The Launching of Modern American Science, 1846–1876* (New York: Knopf, 1987), 255, and Nathan Reingold, *Science in Nineteenth-Century America, a Documentary History* (London: Macmillan, 1966), 8, respectively. This assessment dates back to Bache’s own time. In his eulogy of Bache, astronomer Benjamin Apthorp Gould



Fig. 1. Alexander Dallas Bache

(From American Philosophical Society, Proceedings 84:2, 1941)

While Bache was the acknowledged leader of mid-nineteenth century American science, however, the authority for his leadership remains enigmatic. One problem is that Bache was less pioneering in his research than in his institutional efforts. In a symposium in honor of Bache's legacy, organized by the American Philosophical Society in 1941, Frank B. Jewett conceded that while Bache's contributions to science "dealt largely with ... [scientific problems] of recognized fundamental importance," they nevertheless concerned "departments of physics which neither then nor later

suggested in 1868 that to his colleague, "the scientific progress of the nation is indebted, more than to any other man who has trod her soil." Benjamin Apthorp Gould, "An Address in Commemoration of Alexander Dallas Bache," American Association for the Advancement of Science, *Proceedings* 17 (1868): 35.

could be regarded as spectacular or especially productive.”² In his more recent assessment, Bruce perhaps overemphasizes this point by arguing that as “a scientist, Bache fell far short of both his famous ancestor [Benjamin Franklin] and his friend Professor [Joseph] Henry.”³ These observations reflect the fact that while Bache plays a prominent role in accounts of the institutional development of American science in the nineteenth century, he is less prominent in accounts of the development of the cognitive content of science in that period.⁴ This has left Bache with a somewhat ambivalent reputation. Bache was well connected through relatives in Pennsylvania and in federal politics. Was he not much more than an apt administrator, an institutional booster with good connections and a knack for federal fundraising?

Another aspect of Bache’s career complicates matters, and that is his involvement in education before 1842. While historians of American science have focused on his institutional role and his leadership in the professional community, historians of education have focused on Bache’s role as president of the Girard College for Orphans and as first principal of Central High School in Philadelphia.⁵ In 1836, Bache gave up his professorship at the University of Pennsylvania in order to assume these and other educational activities. How do such efforts fit into the pattern? Was Bache interested in cultural control, a Whiggish interest in “moral and intellectual discipline” both in his educational and in his professional leader-

2 Frank B. Jewett, “Alexander Dallas Bache. A Founder, First President and Benefactor of the National Academy of Sciences,” American Philosophical Society, *Proceedings* 84, no. 2 (1941): 181.

3 Bruce, *Launching of Modern American Science*, 17. Similar comments abound. Another example is Mary Ann James, *Elites in Conflict: The Antebellum Clash over the Dudley Observatory* (New Brunswick: Rutgers Univ. Press, 1987), 26.

4 Geodesists of course remember Bache, as attested by the American Philosophical Society’s symposium in 1941. *Commemoration of the Life and Work of Alexander Dallas Bache and Symposium on Geomagnetism*, American Philosophical Society, *Proceedings* 84, no. 2 (1941). He is mentioned in Mark Littmann, *The Heavens on Fire: The Great Leonid Meteor Storms* (Cambridge, UK: Cambridge Univ. Press, 1998). My argument here pertains to Bache’s research record in relation to his institutional role. For more on this, see chap. 4 below.

5 These include: David F. Labaree, *Making of an American High School* (New Haven: Yale Univ. Press, 1992) and David B. Tyack and Elisabeth Hansot, *Managers of Virtue: Public School Leadership in America, 1820–1980* (New York: Basic Books, 1982).

ship, or was his educational involvement an extension of his administrative interests?⁶

In the absence of a comprehensive biography of Alexander Dallas Bache, and considering his extensive involvement and leadership in mid-nineteenth century American science, any attempt to clarify such issues will provide insights relevant well beyond the immediate task of identifying the motivational coordinates of his career. Bache's singular role in American science is of particular significance when considered in the context of recent developments in theories of the professions.

2. The Revised Theory of Professionalization

Historians have most commonly discussed Bache's career in the context of the emergence of the American scientific community.⁷ In his pioneering work on the history of American science, A. Hunter Dupree had focused on the history of science as a development leading to the federal support

6 Hugh R. Slotten, "The Dilemmas of Science in the United States. Alexander Dallas Bache and the U.S. Coast Survey," *Isis*, no. 84 (1993): 47. Slotten does not discuss Bache's career overall but focuses on his Coast Survey work. He does use similar ideas for explaining Bache's educational work in his essay on "Science, Education, and Antebellum Reform: The Case of Alexander Dallas Bache," *History of Education Quarterly* 31, no. 3 (Autumn 1991): 323–42. For more on this, see chap. 5.

7 An earlier generation of historians focused on the cognitive content of science. To them, American achievements in the nineteenth century seemed negligible when compared to European science. See, for example, Richard H. Shryock, "American Indifference to Basic Research," *Archives internationales d'histoire des sciences* XXVII (1948): 50–65. See also I. Bernhard Cohen, "Science in America: The 19th Century," in *Paths of American Thought*, ed. Arthur M. Schlesinger Jr. and Morton White (Boston: Houghton Mifflin, 1963); Ronald L. Numbers and Charles E. Rosenberg, eds., "Science in American Society: A Generation of Historical Debate," in *The Scientific Enterprise in America: Readings from Isis* (Chicago: Univ. of Chicago Press, 1996). This focus on the cognitive development of science was modified by Nathan Reingold, "American Indifference to Basic Research: A Reappraisal," in *Nineteenth-Century American Science: A Reappraisal*, ed. George H. Daniels (Evanston: Northwestern Univ. Press, 1972), 38–62, and George H. Daniels, *American Science in the Age of Jackson* (New York: Columbia Univ. Press, 1968). An important book of the early phase, in which the professionalization of the scientific community was discussed, is Sally Kohlstedt, *The Formation of the American Scientific Community: The American Association for the Advancement of Science, 1848–1860* (Urbana: Univ. of Illinois Press, 1976). The most recent overview of the development of American science in the nineteenth century is Bruce, *Launching of Modern American Science*.

of research by the twentieth-century activist state.⁸ In the 1970s, historians shifted their emphasis toward explaining the emergence of professional institutions in the United States. George Daniels suggested that the American scientific profession got started between 1820 and 1840 as it moved from gathering facts to developing “esoteric” knowledge, a process that culminated in the public acceptance of science before the Civil War.⁹ Sally Kohlstedt’s classic work on the *Formation of the American Scientific Community* views the founding of the AAAS in 1848 as a decisive moment. She provides a detailed account of the struggles that led to the organization’s founding and of conflicts within the profession.¹⁰ The historiographic focus altered slightly in the 1980s with authors such as Hugh R. Slotten who stressed “boundary work,” and that scientists used a particular ethos to facilitate social and cultural control. His work was receptive to views that stressed the role of individual and group interests.¹¹

The historical evidence suggested that as a profession, science was somehow distinct from other occupations, and sociological theories seemed to offer the best mode for explaining what it was that scientists were doing and how it was similar to and different from other activities.

In historical writing about the professions, it has proven to be of little benefit to use the term “profession” as one found it at large, because adopting the term from historic sources was to associate it with any occupation claiming professional status.¹² This is why more recent theories have tried to explain the peculiar characteristics of some occupations, such as

8 A. Hunter Dupree, *Science in the Federal Government: A History of Policies and Activities to 1940* (Baltimore: Johns Hopkins Univ. Press, 1986).

9 George H. Daniels, “The Process of Professionalization in American Science: The Emergent Period, 1820–1860,” *Isis* 58, no. 2 (Summer 1967): 150–66. Important literature also includes Nathan Reingold, “Definitions and Speculations: The Professionalization of Science in America in the Nineteenth Century,” in *The Pursuit of Knowledge in the Early American Republic: American Learned and Scientific Societies from Colonial Times to the Civil War*, ed. Alexandra Oleson and Sanborn C. Brown (Baltimore: Johns Hopkins Univ. Press, 1976), 33–69.

10 Kohlstedt, *Formation of the American Scientific Community*.

11 Bruce, *Launching of Modern American Science*, 263. Slotten, “Dilemmas of Science,” 43; see also his *Patronage, Practice, and the Culture of American Science: Alexander Dallas Bache and the U.S. Coast Survey* (Cambridge: Cambridge Univ. Press, 1994).

12 Burton J. Bledstein, *The Culture of Professionalism: The Middle Class and the Development of Higher Education in America* (New York: W. W. Norton, 1976) uses the term too broadly. Laurence Veysey (“Who’s a Professional? Who Cares?,” *Reviews in American History* 3 (December 1975): 419–23) has criticized inflationary uses of the term but has also questioned the relevance of trying to define it.

the tendency by professions to invoke autonomy from outside social and political interference and to organize their own affairs. Very broadly speaking, there have been two sociological positions relevant for historians. A structural-functionalist approach (Talcott Parsons, William J. Goode) stressed the profession's role in developing, preserving, and using esoteric knowledge considered to be an important cultural value. One problem with this idea was that it could not explain why the professions successfully insisted on autonomy and how they had averted control by outside experts or administrators. Another approach focused on the profession as an interest group (Terence J. Johnson, Magali Sarfatti Larson). It considered the profession's claims of representing esoteric knowledge as an ideological tool for establishing market control in order to protect pecuniary interests and advantages. Neither of these two theoretical perspectives addressed the issue of whether professions pursue a specific type of activity different from other activities that do not require autonomy and exclusive organization.¹³

In his revised theory of professionalization, Ulrich Oevermann does not restrict "professionalization" to the emergence of organizations or successful claims for autonomy by occupational groups. He argues that professions are distinct from other types of vocations because of the peculiar type of activity in which they are engaged. He suggests that professions seek to restore a client's autonomy with reference to the client's particular autonomy potential and that they are responsible for a "vicarious crisis management" (or "vicarious problem solving"). In considering a therapy for a given disease, a medical doctor, for example, will have to take into consideration a patient's specific health and living situation. This requires a particular "habitus," a readiness to become aware of the particularities of unforeseen patterns as well as a readiness to intervene to the best of one's ability even in cases where available knowledge provides no answer. This

13 I am following Peter Münte's overview: Peter Münte, *Die Autonomisierung der Erfahrungswissenschaften im Kontext frühneuzeitlicher Herrschaft: Fallrekonstruktive Analysen zur Gründung der Royal Society* (Frankfurt: Humanities Online, 2004), 1:21 ff. For the different positions mentioned here, see Talcott Parsons, *The Social System* (Glencoe, IL: Free Press, 1951); Talcott Parsons, "The Professions and Social Structure," *Social Forces*, no. 4 (May 1939): 457–61; William J. Goode, "Community within the Community: The Professions," *American Sociological Review* 22 (1957): 194–200; Terence James Johnson, *Professions and Power* (London: Macmillan, 1972); Magali Sarfatti Larson, *The Rise of Professionalism: A Sociological Analysis* (Berkeley: Univ. of California Press, 1977).