

Book Reviews

Philanthropists and Promoters

Dollars for Research. Science and Its Patrons in Nineteenth-Century America. HOWARD S. MILLER. University of Washington Press, Seattle, 1970. xiv, 258 pp. + plates. \$9.50.

This study provides a thoughtful but episodic view of private support of American science in the 19th century. Government support has previously received significant attention from historians, but private support has not. Miller here demonstrates control of two relatively new fields of historiography: the history of American science and the history of American philanthropy. He combines them to reveal the emergence at the end of the century of a pattern of scientific support wholly different from that prevailing at the beginning.

His first episodes record new levels of support for astronomy mobilized in the 1830's and 1840's. First is recounted Albert Hopkins's success in establishing an observatory at Williams College, next the ability of Ormsby MacKnight Mitchel to sell shares to interested amateurs to purchase a good telescope in Cincinnati, and then the general subscription launched by Harvard College to buy a still larger telescope. The tensions between the lay public providing such support and the professional astronomers directing the observatories came to a head at the Dudley Observatory in Albany in the 1850's. The scientific leaders in Washington and Cambridge who supported the designated director, Benjamin A. Gould, had finally to retreat, thus demonstrating the difficulty of basing a scientific institution upon popular, voluntary support.

Later, when the great optical telescopes were built, the pattern was reversed; the astronomers, not the donors, called the tune. Here, Miller effectively displays the foibles of the eccentric James Lick and the robber baron Charles Yerkes. He brings to attention that ideal patron, Catherine Wolfe Bruce, who did not need promoter-scientists such as George Ellery Hale to set her in motion but who offered help for the best professional objectives.

The questions of basic science versus technology and of basic science aims versus promotional aims are introduced at several points. Miller compares Asa Gray with Louis Agassiz, concluding that Gray was the more profound scholar and that Agassiz mobilized support with greater finesse. Less generally familiar is the curious drift in emphasis which Miller describes in the early development of the Lawrence and Sheffield scientific schools. Although the donors in each case wanted to endow institutions to train men for needed technological roles, the faculties from the beginning turned the schools from practice toward basic science.

In the feud between Edward D. Cope and Othniel C. Marsh over the discovery of fossils, Miller confronts another case in which the values of science vied with promotional values, but for each of these men support was initially provided by family wealth. This rivalry offers the historian an opportunity to compare government with private support, for, in the end, Marsh gained the greater victory partly because of his access to government support through the Geological Survey—although Cope had had earlier government support from the Hayden Survey. Miller reports some of the facts, but he does not weigh the differences between government and private support.

Early private support accorded science was largely a matter of buying instruments, but much more sophisticated and directed support was provided later in the century. The visiting English physicist and lecturer John Tyndall awakened concern for endowment funds at a critical period. Still more significant were the endowments of research institutions provided by John D. Rockefeller and Andrew Carnegie. Rockefeller saw research as close to the center of his purpose in endowing the University of Chicago. The Carnegie Institution was a new type of research institution which would not compete with the universities but complement them; more important, it became the prototype of the 20th-century American research foundation.

The greatest weaknesses of this book are at its periphery. The author exaggerates the deficiencies of American science prior to the era with which he deals. For example, the science of John Winthrop and David Rittenhouse was in no measure, as Miller asserts, inspired by piety, and Rittenhouse's instruments were in no degree makeshift. Colonial science was certainly not limited to natural history nor had a cabinet of natural curiosities ever been the index of the scientist. It could not possibly have been difficult in any but the weakest early-19th-century colleges to distinguish natural philosophy from natural theology. Further, Miller's own account provides much better grounds for explaining the limitations of American scientific achievement than the negative influence of Baconian philosophy to which he ascribes them. Despite the assertions of 19th-century publicists and scientists, modern scholars should recognize that Baconianism was merely an epithet for "empirical," and America, as well as Europe, had witnessed a long conflict between the rational and the empirical in the pursuit of science.

At its center, this book fulfills well its objective of catching the spirit and plotting the impact of private philanthropy upon science. At the end of the century, this support was responsible for research centers and foundations about to flower into leadership. Miller tells his story engagingly and in human terms. He does not exhaust the subject but provides a good introduction for a wide range of readers and a good stimulus for researchers.

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Market Projections

Human Resources and Higher Education. Staff Report of the Commission on Human Resources and Advanced Education. JOHN K. FOLGER, HELEN S. ASTIN, and ALAN E. BAYER. Russell Sage Foundation, New York, 1970. xxxii, 480 pp., illus. \$17.50.

The progenitors of this book are the organized elite of U.S. higher education: the American Council of Learned Societies, the American Council on Education, the National Academy of Sciences-National Research Council, and the Social Science Research Council. The Carnegie Corporation and the Russell Sage Foundation split the bill. The councils appointed a prestigious