Book Reviews

The Days of Self-Help

The Patronage of Science in the Nineteenth Century. G. L'E. TURNER, Ed. Noordhoff, Leyden, The Netherlands, 1976. vi, 218 pp. Dfl. 55. Science in History, 1.

By the end of the Victorian era, during which the British state loomed larger in providing services on an unprecedented scale, scientists customarily complained about the lack of official foresight in not providing more handsomely for scientific research and other scientific activities. Moreover, they liked to point to Britain's commercial and military rival, Germany, as a nation outstripping their own in this regard. When in H. G. Wells's *Food of the Gods* the earnest scientist, Mr. Bensington, was prevented by his cousin Jane from "experimenting" upon tadpoles in their flat, he insisted that "nothing ought to stand in the way of the Advancement of Science, and she said that the Advancement of Science was one thing and having a lot of tadpoles in a flat was another; he said that in Germany it was an ascertained fact that a man with an idea like his would at once have twenty thousand cubic feet of laboratory placed at his disposal, and she said she was glad . . . that she was not German." Historians of science, perhaps traumatized by the debates of the post-Sputnik era, usually have taken Mr. Bensington's side, and have assumed that lavish state support is natural, necessary, and right for all historical periods. Today, however, many historians are taking a second look, and seem to be veering toward the position of Cousin Jane. Has state patronage, as the editor of the volume reviewed here claims, "come to operate like the Sorcerer's Apprentice, and must be halted in its mechanical liberality"?

The Patronage of Science in the Nineteenth Century contains five essays. The first, by Robert Fox, explores "Scientific enterprise and the patronage of research in France 1800–70"; the second is J. B. Morrell's "The patronage of mid-Victorian science in the University of Edinburgh"; and the third is D. S. L. Cardwell's "The patronage of science in nineteenth-century Manchester." Each of these three in its own way extols individual initiative and self-help. Fox sees the much-discussed decline of French science as caused, not by the relative parsimony of the French government, but by the lack of initiative of the French scientists who turned from a corporate research ideal to popular lecturing and public careers as means for advancement. Morrell deftly shows, using the University of Edinburgh as his example, that scientific research and teaching became more expensive by the mid-Victorian period and eager scientists were hampered by governmental restraint. They had to rely instead upon the traditional British virtues of self-help and individualism. In this they were encouraged by the government, which "expected that the stimulus of private competition and the liberality of private patronage should be utterly exhausted before state subsidies should be given to the University" (p. 87).

Cardwell turns to the much-neglected urban scene and provides an able overview of the rich and complex scientific and technical developments in Victorian Britain's most interesting city. He concludes that the "endowment of science in Manchester over the years 1800–1914 is perhaps the best instance of self-endowed or self-supporting science on record," even while pointing out that the city enjoyed, as America did, hidden subsidies from elsewhere in the form of immigrants to the scientific community (pp. 108–109). In the fourth essay, however, R. M. MacLeod provides useful balance to the self-help picture by investigating in detail the efforts of the Treasury to support science. Although civil servants tended not to appreciate the "ultimate value of fundamental research," men of science underrated "the necessity of accountability" (p. 160). MacLeod's sound conclusion that it "was this collective difficulty" that resulted in useless controversy bears lessons for us today. Finally, W. H. Brock has written a provocative overview, listing the various sources both public and private on which Victorian scientists drew in order to patch together incomes for scientific work. He notes that while British science in the 19th century "presents an overall impression of laissez-faire and self-help . . . other forms of patronage, including state support, were present to a degree and were taken advantage of by men of science seeking their careers" (p. 200).

Although *The Patronage of Science in the Nineteenth Century* by offering excessive praise to self-help often appears to make a virtue of necessity—then and now—it is a valuable beginning. By focusing attention upon the problems surrounding the sources of support for science, the contributors encourage others to attack these issues on a broader front. It should be noted, however, that individualism, self-help, and voluntarism are not explanations but descriptions. Fox's interpretation (quoting Renan) of national differences on the basis of "the peculiar characteristics of the French mind" is a provocative challenge, not a satisfying clarification. Victorian scientific institutions were formed by concerned groups in response to the external pressures of urbanization and industrialization, and to the internal forces generated by specialization and scientific advance. It remains for historians to describe the resolution of these forces and to explain the mechanisms of the evolution of the institutions so generated.

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India's Commitment to Science

Building Scientific Institutions in India. Saha and Bhabha. ROBERT S. ANDERSON. McGill University Centre for Developing-Area Studies, Montreal, 1975. x, 124 pp. Paper, $3.50; developing countries, $2. Centre for Developing-Area Studies Occasional Paper Series, No. 11.

India, a country of large economic and social challenges, exploded a nuclear device in 1974, launched a satellite in 1975, and committed $110.2 million of its national budget to atomic energy and nuclear research plus $24 million to space research in 1973–74. With the Tata Institute of Fundamental Research, the Saha Institute of Nuclear Physics, the Council of Scientific and Industrial Research (India), and a network of atomic and space