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Genevan Scholars in Intellectual Europe: From the 17th Century to the Middle of the 19th Century - French

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historian of science and technology is given by Pietro Redondi of the Centre de Recherches Alexandre Koyré. Two additional essays on historiographic themes are by Ruy Gama (on the history of technology in Brazil) and Juan Vernet (on the history of Arabic science). The only case studies of specific national histories in the volume are a survey of three hundred years of Mexican colonial science (by Elías Trabulse) and an essay on nature and culture in Spanish thought, with special reference to the beginnings of Spanish geography (by Horacio Capel).

The second of these volumes is the first number of Cuadernos de Quipu, a new series that, along with the journal *Quipu*, is edited by J. J. Saldaña and published by the Latin American Society for the History of Science and Technology. The articles constitute the proceedings of an international symposium on the history and philosophy of science in the Americas and explore many of the historiographic themes discussed above. The first five papers (by Hebe Vessuri, José Catalá, Antonio Lafuente, Xavier Polanco, and Saldaña) give evidence of the vigor of the debate in the Spanish-speaking world over issues relating the history of science to questions cultural, epistemological, geographical, and economic. Four additional papers range over such topics as U.S. scientific institutions (Sally Gregory Kohlstedt), Argentine contributions to the social sciences (Celina Lértora Mendoza), the history of mathematics in Colombia (Luis Arboleda), and the medieval origins of modern science (Ubiratan D'Ambrosio).

Both of these books contain significant essays, including some material not readily available from other sources; they provide much food for thought for a discipline still in the process of defining its boundaries, confirming its methodologies, and identifying those social and cultural mediations that make science and technology the tools of political and economic power.

DAVID WADE CHAMBERS

Jacques Trembley (Editor). *Les savants genevois dans l'Europe intellectuelle: Du XVIIe au milieu du XIXe siècle*. [iv] + 468 pp., illus., index. Geneva: Journal de Genève, 1987. \$65.

This is a handsome book, well-bound and furnished with color illustrations. It in-

cludes eight essays: two introductory pieces discuss Genevan science from its beginnings around 1700 to the mid-nineteenth century and the European scientific context during the same period; six essays treat the various scientific disciplines, from mathematics and astronomy to geology, zoology, and botany. Following these is a chapter of biographical entries for forty-six Genevan *savants*.

The opening essay, Jean Starobinski's "L'essor de la science genevoise," sets some questions to be addressed in a study of Genevan science. How is one to explain the extraordinary fertility of science in a small town (20,000 residents in the eighteenth century) embroiled in continual political conflict and almost entirely lacking in scientific institutions before the last years of the eighteenth century? Some answers are suggested: Geneva had a good library, its publishing houses provided contact with the European scientific community, and the decline of Calvinist theocracy and a growing religious skepticism turned young aristocrats away from ecclesiastical careers towards science, which suited the serious tastes of Genevan Protestants and offered one of the few opportunities to make oneself known outside the city. Elsewhere in the book other issues are touched on. Does it make sense to speak of a characteristically Genevan science in a cosmopolitan age, when many Genevan savants spent much of their scientific life outside the city? If there was a Genevan science, what was it like? Strangely enough, two obvious matters are nowhere directly addressed: the phenomenon of Genevan scientific families and the geographical situation of the town, especially its proximity to the Alps. The vogue for Alpine exploration and literature greatly stimulated Genevan science.

The characteristics of Genevan science are briefly discussed in the second essay, Jacques Roger's "L'Europe savante, 1700-1850." Roger believes that a distinctively Genevan science arose only in natural history; there the Genevans stood "dans le parti de l'observation . . . et de l'expérience" (p. 51), with the party of Réaumur, rather than on the side of speculation and theory, represented by Buffon. Mario Buscaglia elaborates this theme in his chapter on zoology, arguing that Abraham Trembley and Charles Bonnet contributed significantly to the development of the experimental method in natural history. The

tradition they established of rigorous, exact experimentation and methodological self-consciousness was articulated, though imperfectly, by Jean Senébiér in his three-volume *Essai sur l'art d'observer et de faire des expériences* (1802) and carried on by François and Pierre Huber, father and son, in their studies of bees.

These views of a peculiarly Genevan approach only in natural history seem too limited, however. Cléopâtre Montandon in *Le développement de la science à Genève aux XVIIIe et XIXe siècles* (Editions Delta, 1975; p. 72) has suggested that an emphasis on precise observation at the expense of theory can be found among Genevan savants as far afield as linguistics, Egyptology, and sinology. Furthermore, the Genevans Jean-André Deluc and Horace-Bénédict de Saussure established a tradition of precise experimentation in physics, and de Saussure is known as a meticulous geological observer. Exact observation might well qualify as a salient characteristic of Genevan science as a whole.

Albert Carozzi's essay on geology, however, points to the limitations of such a thesis. On the basis of extensive research among de Saussure's papers at Geneva, Carozzi argues against the commonly accepted view that the geologist was unwilling to engage in theoretical speculation. De Saussure's failure to publish a theory of the earth should be attributed not to his methodological tastes but to the distractions of Genevan politics during the French Revolutionary period and to his untimely death. Carozzi also devotes considerable discussion to Deluc's geology and arrives at a balanced judgment of his work and at an explanation of his considerable influence.

The other essays are primarily collections of brief scientific biographies; they will be useful as sources of information on Genevan scientists who are not well known. One feels that the book would have been stronger if these essays addressed thematic issues or treated their subjects in greater depth.

THEODORE S. FELDMAN

Jane Maienschein. *100 Years Exploring Life, 1888–1988: The Marine Biological Laboratory at Woods Hole.* xiv + 192 pp., illus. Boston: Jones & Bartlett, 1989.

Thirty years ago, a freshly-minted B.Sc., I stepped onto the railroad platform of Woods Hole, Massachusetts, after a lei-

surely ride from Boston along the Buzzards Bay shore. I had been hired to work at Woods Hole Oceanographic Institution, but after a day or so I found that it was the Marine Biological Laboratory that dominated summer life in Woods Hole. The town was alive with university people from all over the United States, the MBL Club was the center of scientific social life, and the MBL's Friday Evening Lectures introduced me to the eminent or great, like George Wald, J. Z. Young, Donald Griffin, and Hugh Huxley. Most of all, the library, open without restriction day and night, week and weekend, throughout the year came to mean the MBL and its ideal of unrestrained learning. I was hooked, as hundreds before and after me have been, by the realities and ideals of scientific life in Woods Hole.

The MBL's centennial in 1988 was marked by ceremonies, essays, and books on late-nineteenth-century biology in the United States, a celebration of the links between Naples and Woods Hole, and a compilation of historic Friday Evening Lectures. Jane Maienschein's new book is the latest of these views, often revisionist, of American biology during its most creative phase of growth.

European marine stations, most of them founded during the last three decades of the nineteenth century, may have inspired biologists in the United States and Canada, but the MBL began in response to American concerns—how to educate teachers and how to resolve the tension between medical education and a professionalizing biology. It unasily filled the role of teaching institution and research laboratory in cell lineage, physiology, and heredity; on a larger stage it justified American science to Europeans who viewed the New World as still a geographical and intellectual frontier. As Philip Pauly has said, the MBL “formed the center for cohesive academic elite, through which biology rapidly became established as the core of the life sciences in America” (Ch. 4 of *The American Development of Biology*, ed. R. Rainger, K. R. Benson, and J. Maienschein, Univ. Pennsylvania Press, 1988, on p. 137).

Despite its eventual success, there are still intriguing questions about the MBL and biology. If laboratories like the MBL expressed and fostered the growing professionalization of biology, how was the transfer made from marine laboratory? Which way did the traffic run? Was it more