terial provides the basis for the discipline's history. Both must be preserved. Jeremy Sabloff puts it right in his essay: "Historical analyses of the arguments are important; they provide a context for the arguments and indicate what arguments have had positive, negative or neutral effects in the past." The "contexts for the arguments" in historical analyses are typically multiple and fluid; they are best rendered apart from an a priori bias about what constituted that context.

C. C. LAMBERG-KARLOVSKY
Peabody Museum,
Harvard University,
Cambridge, MA 02138

Scandinavian Contributions

Science in Sweden. The Royal Swedish Academy of Sciences, 1739–1989. TÖRE FRANGSMYR, Ed. Science History Publications (Watson), Canton, MA, 1989. viii, 291 pp., illus. $45.

Two persons stand out in the chronicles of the Royal Swedish Academy of Sciences, the naturalist Carl Linnaeus and the chemist Jöns Jacob Berzelius. As the first president Linnaeus dominated the Academy during its great early period in the middle of the 18th century. Berzelius became permanent secretary in 1818 and reorganized the then slumbering organization into a new great period in which he played the central role. These two men had a pervasive and lasting influence on the development of Swedish science and were its foremost contributors internationally. I believe this much can be said without offending anyone in the long line of illustrious Swedish natural scientists.

First place no doubt goes to Linnaeus. Reading this collection marking the 250th anniversary of the Academy I am struck by the central role that natural history has played in the Swedish scientific tradition, first in the form of classification and description by Linnaeus and his numerous pupils, later through studies of geology, geophysics, oceanography, and ecology. This latter tradition in Sweden and other Scandinavian countries reached a high point in the late 19th and and early 20th century and is just beginning to attract the attention of historians of science. It has been broadly described in Gunnar Eriksson's 1978 book *Kartleggarna* (the title refers to makers of maps and inventories) and is portrayed in several papers in this volume.

In his paper on the Swedish Museum of Natural History Gunnar Broberg emphasizes the continuity from Linnaeus. As he notes, "the eighteenth-century focus on taxonomy and the world inventory became, if anything stronger in the following century" (p. 150). The first natural history exhibition opened to the general public in 1794 and the activity expanded through the 19th century, culminating in the opening of the great new palace of the Swedish Museum of Natural History in 1916. By then research had taken prominence over public exhibitions.

The leading role played by the Academy, and not least the staff of the Museum, in the conservationist movement is described in Bosse Sundin's paper, "Environmental protection and national parks." Modern Swedish ecological science has played a pioneering international role in drawing attention to environmental problems, for instance acid rain. The basis for the Academy's activity in this field was laid by the protection-of-nature law passed in 1909. A new breakthrough came in the 1960s with the establishment of a number of agencies for the protection of the environment (p. 221).

Another important strand in the broad concern with the natural world is taken up by Tore Frängsmyr in his account of Swedish polar exploration. The theory of the ice age (or ages) was a central theme in 19th-century Swedish geology. At first the idea that Scandinavia should have been covered by an immense ice shield appeared too fantastic to be true, but by the second half of the century there was sufficient evidence to make it a well-established theory. Obtaining material to test and develop this theory was one motive for Swedes to travel into the Arctic. But there were also other motives, as when A. E. Nordenskiöld made the first northeastern passage to the Orient on the ship *Vega*. This Swedish tradition of polar exploration was later continued by Norwegians like Fridtjof Nansen, Roald Amundsen, and H. U. Sverdrup.

As indicated above, Scandinavian scientists made a considerable international contribution to the study of the natural world in the last part of the 19th and the early part of the 20th century. And Stockholm was the main center for this research. Besides the Museum of Natural History there was also the new University of Stockholm (Stockholms Högskola). Here worked, for instance, the oceanographer Otto Petterson and the physical chemist Svante Arrhenius, and for some years the geologist W. C. Brögger (Norwegian), the ecologist Eugenius Warming (Danish), and the meteorologist Vilhelm Bjerknes (Norwegian).

Practical economic interests were important for the Academy from its start. The investigations of Linnaeus and his pupils, for instance, had an agricultural aspect. The first Swedish professor of economics, Anders Berch, attached highest priority to knowledge relevant to manufacturing. Linnaeus, by contrast, insisted on knowledge useful to agriculture. And it was the latter that in fact occupied most of the early publications of the Academy. When Linnaeus succeeded in funding a second chair in "practical" economics in 1759 it was occupied by one of his own pupils. As the utilitarian spirit faded in the late 18th century, Berch's chair was taken over by jurists and the chairs in practical economics increasingly became positions in pure botany. But this does not mean that the practical link of natural history disappeared. It was rather a reflection of specialization, as witnessed by the establishment of a Royal Academy of Agriculture in 1812. The links between natural history and practical economy were to some extent reasserted in the late 19th century as science was applied to new endeavors, such as plant and animal breeding, geological surveying, and fisheries research.

Attention to such connections in Swedish science may also help bring out more clearly the difference between the broad utilitarian perspective of the 18th and 19th centuries and the narrow modern rationality of aims and means. The book that Frängsmyr and his coauthors have produced not only contains a set of readable sketches presenting central aspects of Swedish natural science during the last 250 years, it suggests interesting perspectives to the general reader and worthwhile research problems to the historical scholar.

NILS ROLL-HANSEN
Institute for Studies in Research and Higher Education,
0260 Oslo 2, Norway

Association Life

Renewing a Scientific Society. The American Association for the Advancement of Science from World War II to 1970. DAEL WOLFLE. American Association for the Advancement of Science, Washington, DC, 1989. x, 337 pp. Paper, $24.95; to AAAS members, $19.95.

In the *New York Herald Tribune* of 29 December 1952 the American Association for the Advancement of Science was reported to be reorganizing in the face of "intellectual bankruptcy." The report resulted from a joint interview with Edward U. Condon (a physicist), who was about to succeed to the presidency, and Warren Weaver (a mathematician), who had just become president-elect. The conclusions of this distinguished pair were that the annual meetings were "outmoded," that AAAS programs had grown "thinner," and that it was time to "revitalize the association." AAAS was obviously at a low point in its history.