Book Reviews

Berthollet, Laplace, and Company

The Society of Arcueil. A View of French Science at the Time of Napoleon I. MAURICE CROSLAND. Harvard University Press, Cambridge, Mass., 1967. 534 pp., illus. $15.

Early in 1807 Claude Louis Berthollet and Pierre Simon Laplace gave structure to their activities as patrons of French science by organizing the Society of Arcueil. It was a short-lived society, meeting only through 1813, with a membership totaling 14. Though three volumes of *Mémoirs de la Société d'Arcueil* were published (1807, 1809, 1817), the society kept no records and developed no formal institutional procedures. It was, however, one of those rare scientific societies which substituted brilliance of membership, solid achievement, and extended influence for large size and formal organization. Simply to list the members indicates its importance: besides Berthollet and Laplace, the early members were Alexander von Humboldt, Jean-Baptiste Biot, Louis Jacques Thenard, Joseph Louis Gay-Lussac, Auguste de Candolle, Hippolyte Collet-Descotils, and Berthollet's son, Amédée Barthélemy. Before its dissolution, the society had added Étienne Louis Malus, Dominique Arago, Jacques Bérard, Jean Antoine Chaptal, Pierre Louis Dulong, and Siméon Denis Poisson. Seldom can there have existed a scientific society whose membership was of equal caliber.

Although references to the Society of Arcueil are frequent in accounts of 19th-century French science, no extended treatment has been available. Crosland has attempted that here, in a work with substantial scholarly merit though unevenly successful as institutional history. The problem lies in the peculiar relationship of the society to other contemporary French scientific institutions.

The society took its name from the village of Arcueil, near Paris, where Berthollet purchased a home in 1801 and to which Laplace moved in 1806. Once a fortnight carefully selected young scientists would meet at Berthollet's house to discuss problems, perform experiments, and read papers. But in another sense, the society was in continuous session. Laplace and Berthollet gave freely of their time and counsel, Berthollet's laboratory was available for members' use, and the *Mémoirs* made possible the prompt and respectable publication of members' work. But the proximity of metropolitan Paris, with its scientific and educational institutions at which all the members lectured and worked, makes it next to impossible to separate the activities of the Society of Arcueil from those of the others, the École Polytechnique, for example, or the Société Philomatique, or the First Class of the Institut de France. This imposes problems of discrimination and organization on a historian of the society, with which Crosland has obviously struggled, not entirely successfully.

Crosland attempts to avoid some of the difficulties by treating the Society of Arcueil as a special example of the patronage of French science. The result is an extended description of the social and institutional character of Napoleonic science which postpones explicit treatment of the Society of Arcueil to the latter half of the book. Once we get to the society, the going becomes considerably easier. The interplay of personality, the relation between ideas of the patrons and work of the junior members, and the origins of some of the seminal discoveries of 19th-century science—for example, Malus and polarization by reflection, Gay-Lussac and combining volumes—are all illuminated by Crosland's work. His suggestion that Arcueil's program fulfilled the Newtonian commitment of Laplace and Berthollet is particularly interesting, as an explanation for the unique Newtonian character of early 19th-century French science.

The Society of Arcueil is packed with information. It provides a most convenient access to much of Napoleonic scientific activity and the only one to that of the Society of Arcueil. It is not light reading, but it is highly useful studying and is unlikely soon to be superseded.

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The Worlds of the Eskimos

Eskimo Masks. Art and Ceremony. DOROTHY JEAN RAY. Photographed by ALFRED A. BLAKER. University of Washington Press, Seattle, 1967. 260 pp., 82 plates. $12.50.

Dwelling in a land where food was often scarce, and where winter lasted eight or nine months of the year, the Eskimos viewed much of the human experience with more than ordinary pragmatism. If a person died during the cold season, the corpse often was simply abandoned or was put up on the family meat cache until the following spring when grave digging became more practicable. When sled dogs reached ages of six or seven they were considered too old to work and were accordingly killed. Because there was little else to eat, nearly all of the scattered Eskimo tribes lived mainly by hunting the large mammals of the tundra and the Arctic seas. When the game failed, as it rather commonly did in one part or another of the Eskimo world, the people ate whatever else was available. Familiar and traditional diets of hunger, in that environment of few resources, included gulls, roots, boots, and dogs.

On the one hand, therefore, Eskimo life was a study in the kind of realism that is derived from acute necessity. On the other hand, however, the Eskimos were in possession of a rich and extensive intellectual and esthetic culture. They were certainly among the best of storytellers—recounters of a seemingly endless variety of tall and short tales, creation myths, heroic episodes, and doings of the animal people. Their shamans were capable of magical and supernatural feats that not only awed the Eskimos themselves but sometimes astonished visiting traders, whalers, and missionaries as well. They had phenomenal knowledge of vertebrate anatomy and taxonomy, even of those northern forms which had little or nothing to do with their economy. Their art, especially their carvings of stone, wood, bone, and

ivory, was excellent by any standard.

There were correspondences, of course, between Eskimo intellectual and esthetic culture and the realities of everyday life. Among those connections was a constellation of activities ordinarily related to the food quest or to curing, which involved the ritualistic and ceremonial uses of masks. In this book, Dorothy Jean Ray primarily addresses herself to describing a collection of such masks from the coasts and islands of 19th-century Alaska, most of which are in the Lowie Museum at Berkeley.

The volume has two major sections. The first part, in addition to a short introduction and 12 color plates, contains chapters on the history of Eskimo masks, why and how they were carved and how they were used. The second part, in addition to a bibliography and index, consists of 70 full-page plates and a substantial chapter of descriptions of the masks depicted. About 170 masks are illustrated and described.

In one sense, the book falls between two stools, for it is neither solid ethnography nor a study in depth of a plastic art form. One has the feeling that the author is writing to the modern thinking man who is a little bit interested in art and a little bit interested in Eskimos. Ray has by no means exhausted her subject. Further, in treating historical and ethnographic data, she is inclined to take a kind of potshot approach that is bound to disconcert the serious researcher. She also makes a few mistakes. In her best chapter, entitled "Archeological-historical relationships," she partially bases an interpretation of an important historical event on the assumption that dog traction was introduced to northwestern Alaska "within the last three centuries." This is hardly in agreement with the archeological evidence. However, the book has its virtues. It is without question a fine catalog of the western Eskimo masks in the Lowie Museum. Its illustrations are excellent, and many of the accompanying descriptions are based, in part, on the author's own field data. Further, the previously mentioned chapter on archeological-historical relationships is by and large a scholarly piece of work. In a generally well-documented summary, the author presents a convincing case for the genesis and development of western Eskimo masks, her point being that proliferation of the art and its concomitant ritual and ceremony did not occur until early historic times, and that these were directly derived from the Eskimo tradition, not from other cultures. Finally, Ray has managed to say something about how the Eskimos, in the world beyond nature, found weapons against hunger and sickness and cold.

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Neurophysiology

Invertebrate Nervous Systems: Their Significance for Mammalian Neurophysiology. C. A. G. WIERSMA, Ed. University of Chicago Press, Chicago, 1967. 380 pp., illus. $10.

Those of us who work in comparative neurophysiology or related areas of biology are immediately alerted when C. A. G. Wiersma organizes and edits a symposium. For more than 30 years he has carried out extensive and fruitful studies of neuromotor control, interneuron function, and sensory information processing, mainly in the crayfish and other decapod crustaceans. Our attention is also drawn to this book by the presence among the 34 contributors of several other distinguished workers, such as F. Huber, C. L. Prosser, and J. Z. Young, in addition to a number of first-rate biologists from the next generation, recently graduated from the Young Turk category. Most of the contributors are from the United States, with a majority of these from West Coast academic institutions; three are British; and there are one each from Canada, Japan, and West Germany.

The title of the book may lead to disappointment on the part of some readers, for the work is neither a broad reference or textbook of invertebrate neurology nor a really coherent discussion of the relevance of the neurophysiology of invertebrates to that of mammals. Indeed, few of the contributors deal substantially with such a relationship; undoubtedly a single dedicated author would be needed to tackle this topic with effective originality. In any case, no one can reasonably challenge the fact that a considerable share of our basic understanding of neurophysiology as a whole has come from an astute study of seemingly recondite invertebrate preparations. The heart and lateral eye of *Limulus*, the giant fibers of the squid mantle, and the muscle receptor organs of the crayfish abdomen are surely classic cases in point.

What the book does do is effectively to present a series of reports on six major topics ranging in complexity from neurochemistry to the neuronal basis of simple behavior, with development and neurosecretion, central nervous programming, and visual information processing as the intermediate sections. Eighteen of the 27 chapters are about the neurobiology of one animal group (whether crustaceans, insects, or mollusks) predominantly; the remaining third have a broader, comparative scope.

The format of the original conference, in which major papers were followed by several satellite presentations, often by associates of the senior author, has been retained. On the printed page, the satellite papers are, however, not easily distinguishable from the major ones, because the chapters range in length from a scant three pages to a generous 32. It is not surprising that the most effective articles are among the longest; unless the short ones are firmly linked to a substantial preceding development they may seem rather ephemeral between hard covers.

For this reader the most successful sections in the book are in the latter half. Particularly impressive is a trio of arthropod-centered chapters by Donald Kennedy, Donald Wilson, and Donald Maynard on, respectively, muscle control, rhythmic motor patterns, and central ganglion organization. The last is noteworthy for its thoughtful originality. The editor's chapter on higher-order visual neurons in decapod crustaceans is enlivened by an account of the astonishing degree to which efferent and intermodal influences act on afferent information processing in the eyestalk. Also provocative is Felix Strumwasser's detailed analysis of factors involved in spontaneous activity and its temporal modulation within single *Aplysia* ganglion cells.

Clearly there are several invertebrate neural elements or systems here described which may well make substantial contributions to our general understanding of neurophysiology, including that of man and other mammals. The likelihood of their doing so will undoubtedly be greatly enhanced if enough readers with what Pasteur referred to as the "prepared mind" become familiar with the current progress reported in this book.

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