cranes with foster sandhill cranes are of great interest both to conservationists and to behavioral scientists.

The breeding of endangered species in captivity and the associated problems of the genetics of small populations and of reintroducing captive-raised birds into the wild receive considerable attention, and the papers on the maintenance of genetic diversity associated with such situations are of special significance. Last, there is a group of papers on integrated approaches to the management of endangered birds.

The book is printed on paper of moderately good quality and has 31 photographic illustrations. It should obviously be part of the library of any biologist concerned with the conservation and management of endangered bird species.

PAUL A. JOHNSGARD
School of Life Sciences, University of Nebraska, Lincoln 68588

Ecology Since Colonial Times

History of American Ecology. With an introduction by Frank N. Egerton. Arno, New York, 1977. Unpaged; illus. $25. History of Ecology.

Why has so little work been done on the history of ecology? The history of most other areas of modern biology, such as molecular and population genetics, physiology, and developmental biology, has been extensively explored, and studies of Darwin are in full flood. Yet the rise of ecology, a science whose roots lie intermingled with those of evolutionary theory, has been generally ignored by historians of biology. The present collection of papers assembled by one of the few historians of ecology, Frank Egerton, is testament to this. Of the nine papers seven (all previously published) were written by working ecologists between 1958 and 1976 and reflect the heterogeneous viewpoints of individuals embedded within the matrix of the history.

The first two long pieces in the book simply recount facts about ecological endeavors from colonial times to the present. Egerton describes the transformation of 18th- and 19th-century natural history into four self-conscious disciplines, limnology, oceanography, plant ecology, and animal ecology; and he identifies the important role that the practical needs of medicine, agriculture, and wildlife and resource management played in structuring ecology up to 1900. Robert McIntosh continues the narrative into the 20th century by detailing the introduction of theoretical concepts and the establishment of a strong tradition of mathematical analysis through the construction of ecological models.

Animal ecology is represented by only a single paper recounting the interplay of economic and scientific trends in fisheries research; and a narrow, though important, aspect of the history of limnology is described in an account of the growth of freshwater studies in Wisconsin. The latter essay makes clear the incredible productivity and significance of the lifelong collaboration between E. A. Birge and Chancey Juday in laying the empirical foundations of midwestern lake studies.

There follow no fewer than four papers on the development of community concepts in plant ecology over the last century and one institutional history, an accounting of the Ecological Society of America, its geographical origins and numerical growth. Only one of these papers attempts a broad analysis, this a study of the American grassland research community using sociological and bibliographical data to test current philosophical notions concerning the way science is done. I was left with a curiously dry taste after all the graphs had been read and felt that the creativity and influence of midwestern plant ecology had been lost from view in the push for quantitative currency. In two of the papers, both dating from the '50's, two plant ecologists argue their own alternative interpretations of plant associations. McIntosh returns with an assessment of H. A. Gleason, Gleason's "individualistic" concept of species distribution, and the long-delayed influence of his ideas on the understanding of plant communities. Perhaps the most important theme to emerge from the several treatments of plant ecology is the overwhelming influence of one man, Frederick Clements, and the dominance of his concept of the plant community as a developing organism.

Overall, this book is not a "history of American ecology" but a collection of primary essays that provides a bibliographical beginning and suggests some possibilities for future work. The problem with the history of ecology seems to be that many of the critical questions have yet to be asked. Darwin was, above all, a remarkable ecological observer; why was the evolutionary side of ecology lost until the second half of this century? Why did ecology first emerge from a somewhat Lamarckian conception of the ontogeny of plant communities, and how did animal population ecology find its way into this view? Why did most early American ecologists grow up and work in the Midwest, and how much is the nature of creativity in ecology influenced by a worker's origins or choice of organisms and habitat? When and how did theoretical ecology eventually establish its legitimacy in the face of a strong tradition of empirical and field work, and what was the role of the greatest living ecologist, G. Evelyn Hutchinson, in bringing a British (Cambridge) philosophical tradition to bear on both community and population ecology? What is the relation between the history of the academic abstractions seen in modern ecology and the immense environmental impact humans have long had on their surroundings? The study of the history of ecology has barely begun, and the present volume represents an important step. The field for fruitful analysis is wide open, and I hope historians will not leave it for ecologists to till alone.

ROBERT E. COOK
Biological Laboratories, Harvard University, Cambridge, Massachusetts 02138

Processes in the Magnetosphere

Geomagnetic Diagnosis of the Magnetosphere. A. NISHIDA. Springer-Verlag, New York, 1978. viii, 256 pp., illus. $38.80. Physics and Chemistry in Space, vol. 9.

The field of magnetospheric physics is still developing rapidly as new and crucial observations are made and interpreted. The discoveries of such major phenomena as the plasma mantle and regions of field-aligned electric fields a few thousand kilometers above the ionosphere have had an enormous impact on the field, yet were made less than half a decade ago. Thus the subject is difficult to deal with in a book, because theories and analyses of data may be obsolete by the time the book is published. Given these constraints, Nishida's book, which deals with the geomagnetician's view of the magnetosphere, will prove to be a valuable addition to the libraries of both graduate students and professional space scientists. The treatment of the various aspects of geomagnetic perturbations is both comprehensive and modern, and each section of the book contains just enough material to give the reader a good overview and provides the necessary references for those who want more than an overview.

If there is any weakness in the book, it is the author's tendency to pass over the controversies that have swirled (and