agree are well summarized. Ideas with which many of us may disagree are presented with persuasive enthusiasm—the kind of enthusiasm that forces one, once and for all, to decide why one disagrees with them.

W. FORD DOOLITTLE
Department of Biochemistry, Dalhousie University, Halifax, Nova Scotia B3H 4H7, Canada

Polar Cap Aeronomy

Exploration of the Polar Upper Atmosphere. Proceedings of an institute, Lillehammer, Norway, May 1980. C. S. DEEHR and J. A. HOLTET, Eds. Reidel, Boston, 1981 (distributor, Kluwer Boston, Hingham, Mass.). xvi, 498 pp., illus. $58. NATO Advanced Study Institutes Series C, vol. 64.

"Aeronomy" is the name coined by Sydney Chapman in 1950 to designate the study of the physics and chemistry of the upper atmosphere of the earth. Needless to say, in the last three decades this field has undergone major transformations. Progress in the aeronomy of the earth's polar region, however, has lagged far behind the work carried out for other regions such as the equator, mid-latitudes, or auroral zone. This state of affairs will change with the advent of a number of recent initiatives. These include the launching of the NASA Dynamic Explorer satellites A and B, the move to Greenland of the incoherent scatter radar currently located at Chatanika, Alaska, and the attainment of operational status by the European incoherent scatter facility, EISCAT. Thus, the review of polar cap aeronomy in this book is timely.

The book summarizes our current understanding of the subject clearly and succinctly. This has been accomplished partly through the device of tutorial papers limited to 15 pages or less that review progress on seven subjects. The book contains 36 such papers on such aspects of polar cap aeronomy as the composition of the neutral atmosphere and ionosphere, optical emissions and related applications, the coupling of the polar cap ionosphere to the magnetosphere and the solar wind, the electrodynamics of the polar cap and auroral zone ionosphere, and the wave-particle interactions in the polar cap. A closing section of four papers covers the applications of polar cap aeronomy to communications and ionospheric weather forecasting. Notable papers presenting new material are those by P. M. Banks and co-workers on the determination of the polar cap electrostatic potentials deduced from ion velocity measurements by the Atmospheric Explorer satellites, by R. W. Smith on the measurements of the neutral wind in the polar cap with a Fabry-Perot interferometer, and by R. M. Thorne and L. J. Andreoli on relativistic electron precipitation. Excellent reviews are contributed by M. A. Geller on middle atmosphere dynamics, by J.-C. Gérard on optical F-region processes, by J. G. Roederer on the solar wind-magnetosphere-ionosphere system, and by G. G. Shepherd on the remote sensing of the optical emissions of the polar cap. As this listing shows, the book is strong on optical studies and provides a representation of the other branches of aeronomy. A section of four papers on the early exploration of the polar upper atmosphere through the visual observations of auroras in Nordic countries since medieval times gives the book historical flavor.

My own interests are in optical emissions of the atmosphere, and I found the papers on this subject to be interesting and reflective of the current status of research. For any graduate student contemplating aeronomy as a specialty, and for any experienced researcher desiring a review of recent activities in polar cap aeronomy, this book is recommended. The book also serves as a useful introduction to the important work being done by European scientists, who do not often publish in the English literature.

JOHN W. MERIWETHER, JR.
Space Physics Research Laboratory, University of Michigan, Ann Arbor 48197

A Colony in Greenland

Haabetz Colonie 1721–1728. A Historical-Archaeological Investigation of the Danish-Norwegian Colonization of Greenland. H. C. GULLØV and HANS KAPEL. National Museum of Denmark, Copenhagen, 1979. 246 pp., illus. Paper, DKr 116.40. Ethnohistorical Studies of the Meeting of Eskimo and European Cultures, 1. Publications of the National Museum, Ethnographical Series, vol. 16.

In 1721 the Danish-Norwegian Moravian missionary Hans Egede, accompanied by his wife, four children, and 40 followers, established the first post-Norse European settlement in Greenland. Egede's "Hope Colony" was located on a wet, exposed island outside Godthaab Fiord in West Greenland, an area exploited by European whalers and once occupied by the Greenland Norse. The colony remained here for eight years before being shifted to a more favorable spot at Nuk (Godthaab), the present-day administrative center of the Greenland Home Rule Government. Written records of the colony survived, but knowledge of its physical location was lost until 1903.

Interest in Hope Colony revived in preparation for the 250th anniversary celebration of Egede's arrival in Greenland, and in 1969–70 the Danish National Museum and the Greenland Landsmuseum conducted excavations to document the site archeologically. In addition to its historic, cultural, and political significance, the investigation of this small early-18th-century European outpost was an interesting anthropological problem. The project was aided by the existence of extensive written records pertaining to the settlement, its demography, economic ties with Europe, and relationships with the Eskimo village located at Kangek, only four kilometers away. Subsequent to their excavation at Hope Colony, the authors turned their attention to Kangek, where they investigated, among other things, the impact of the Egede colony on a contemporary native cultural system. The paucity of such reciprocal studies of cultural relationships in North America has been a serious failure of archeological and anthropological research. The present volume, however, concerns only the work at Hope Colony. A future volume will present the Kangek data.

The first chapter describes the authors' theoretical approach, establishing an anthropological perspective through quotation of Stanley South and Robert Schuyler on the role of American historical archeology studies. A historical sketch details reasons for colonization. In particular, the authors note the growing religious zeal to locate and reconvert the "lost" Norse colonists, mercantile interests in expansion of the whaling industry into Greenland waters, and national territorial expansion. (Only the last was achieved.) The authors describe the colony as portrayed in Egede's diaries, official accounts, ledgers, and inventories. Chapter 2 presents contemporary maps, providing information on the geographic setting of the colony and the location of specific buildings. A chapter describing in detail the structures and features actually excavated confirms the identification of the main dwelling house, smithy, stable, and a warehouse. Chapter 4 (140 pages of the 250-page monograph) describes the artifacts recovered, discussing object function and provenience and relating such items to those that appear on inventory lists. The