

have occurred more recently than did the separation of Aleut and Eskimo. The Yupik-Inupiaq boundary corresponds to the physical differences as well, and is more likely related to population divergence than to production of artefacts.

The major differences between the dialects spoken on the Bristol Bay side of the Alaska Peninsula and those on the Kodiak side are matched by many ethnographic differences, such as in methods of constructing kayaks and making hunting gear. Recognition of such relevant cultural variables as the fact that the Koniags knelt rather than sat in their kayaks would have been helpful for the purposes of relating the past to the present and establishing affinities between geographical groups.

The book has some fundamental weaknesses. There is a tendency to compress, or average to a single date, periods of occupation which may have spanned several centuries, and to compare camp sites and their short periods of occupation with village sites, without due allowance or qualification. Artefact inventories are equated with people through the use of terms such as "slate-polishing people", "stone-chipping people", "Arctic Small Tool people" or "Dorset folk". The inescapable implication is that since lithic peoples could phonate, migrate and reproduce themselves one may dispense with attention to them as people — to their skeletons, blood groups, dentition, measurements, longevity, pathologies, or other carnal aspects of their human existence. In other words, the prehistoric identity of Eskimo populations is assigned to limbo.

Skeletons of Aleuts and Eskimos date back to approximately 2000 B.C. Before that time, ethnic identification by inference is probably more reliable in closed population systems in appendicial areas, such as the Aleutian Islands and Greenland, than in communities in more accessible areas exposed to a seeming multitude of long-range migrations.

As the book is concerned in the main with artefact typologies based on the finished forms, an illustration of the phases in the manufacture of prismatic blades, burins and other stone tools, including the rejuvenation of cores and burins, would have been useful. It might also have indicated affinities with the lithic industries of the Sea of Okhotsk, including northern Japan.

The possible roles of invention, diffusion of stimulus, diffusion of manufacturing techniques as well as items of finished form, and also trade, are processes worth as much consideration as migration. In many cases, techniques and artefacts appear to have diffused

from older populated centres to places more recently populated. Such may have been the case with oil lamps, some bifacially flaked stemmed points made on prismatic blades, and with mummification and burial in caves. Grottochronology may be as useful as glottochronology in establishing the directions of diffusion.

Readers, including the living Eskimos and Aleuts themselves, who may be curious about the evolutionary and cultural identity of past and present Eskimo, Aleut, Indian and Siberian populations will not find this book useful.

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**GEOLOGY OF GREENLAND.** EDITED BY ARTHUR ESCHER AND W. STUART WATT. *Copenhagen: Geological Survey of Greenland, 1976. 603 pages, illus., maps. Dkr 195.00.*

*Geology of Greenland* is a major work. In it are presented the results of studies undertaken both by the staff of the Geological Survey of Greenland and by an international group of geologists, many of whom are past staff members of, or who have carried out research projects for, the Survey. That the manuscripts which have become chapters of the book date back only to three years before it was published is eloquent tribute to the editors' combined abilities not only to charm and discipline the twenty-nine scattered and diverse individual contributors into writing the first drafts, but also to ensure their effective cooperation in doing the thousand things necessary to fashion them at commendable speed into a well-coordinated symposium.

The work comprises twenty-one chapters or papers, including a summary of the geology by the editors. The principal papers are arranged following the geological time scale, Archean to Quaternary. Two papers on the fold belts of East and North Greenland are regional, however, and describe rocks of a wide range of ages. Six papers, which provide reviews of such subjects as economically-exploitable minerals and fossil floras, form the last quarter of the book.

The Precambrian gneisses of Greenland are extensively exposed in the narrow fringe of land around the huge inland ice cap. Detailed studies of these rocks have resulted in

major contributions to understanding of the earth's early crust: "the unravelling of a complex sequence of Precambrian events stretching back in time for nearly 4,000 m.y." to include the oldest dated rocks of the world. A good deal of the "unravelling" is presented in the first major paper, on the Archean, by D. Bridgwater, L. Keto, V.R. McGregor and J.S. Myers. The chapter on the Nagssugtoqidian, by A. Escher, K. Spørensen and H. Zeck, that on the Rinkian by Escher and T.C.R. Pulvertaft, and one on the Ketilidian by J.H. Allaart, are all notable for their clear exposition of structure, for their illustrations, and for the accuracy of their descriptive mineralogy. Stratigraphic and structural data for many localities are given in lengthy papers, on the East Greenland Caledonian by N. Henriksen and A.K. Higgins, and on northern Greenland by P.R. Dawes. Possible relationships of the various East Greenland complexes are discussed, and the probable correlation of the strata of northern Greenland is shown in several figures. A fine, fold-out map of northern Greenland, at a scale of 1:1,500,000, is provided. The remarkable Proterozoic bedded sandstone and volcanic rocks, dykes, "giant-dykes" and "cumulitic" intrusive complexes of the Gardar period are well described and figured by C.H. Emeleus and B.G.J. Upton. In a description of the upper Palaeozoic and Mesozoic sediments of East Greenland, by T. Birkelund and K. Perch-Nielsen, emphasis is placed on lithofacies and palaeogeography, with a strong admixture of palaeontology.

Later chapters in the book are also of a high standard, and include: an account, with depositional model, of the Cretaceous and Tertiary of West Greenland, by G. Henderson, the late A. Rosenkrantz and E.J. Schiener; a description, with model for petrogenesis, of the Tertiary volcanic province of West Greenland, by D.B. Clarke and A.K. Pedersen; and a description of the Tertiary igneous rocks of East Greenland, by A. Noe-Nygaard. A summary of the Tertiary igneous rocks and sediments south of Scoresby Sund is provided by W.A. Deer.

Greenland is dominated by ice and, as one might expect, a relatively full account of glaciation is provided; the author of it, A. Weidick, presents the conflicting ideas that have arisen over many years through the work of numerous scientists of several disciplines. This article, indeed, is one of ideas and events, with hard data included as terse, interspersed passages. All stages from Tertiary to historical times are investigated.

The petroleum possibilities of the main

sedimentary areas of the three provinces of Greenland (West Greenland, North Greenland and East Greenland) are discussed by Henderson; these résumés of relatively "new" areas, particularly of offshore parts, are most timely, and the implications of ages of North Sea source rocks and oil accumulations in the light of the opening, 65 million years ago, of the North Atlantic are exciting. The article on coal geology by Schiener provides, besides basic descriptive data, a historical review and, for the Disko-Nugssuaq region, a facies map and interpretation of depositional conditions.

Some brief papers on a variety of topics bring the book to a close: descriptions of economic mineral occurrences by Perch-Nielsen, fossil floras, by Pedersen; an interesting account of fossil vertebrate faunas, by S.E. Bendix-Almgreen; and a contribution on kimberlites in West Greenland, by J.R. Andrews and Emeleus.

The authors have summarized many recent data, but have, from necessity, depended also on accounts left by early explorers. This causes some problems: confirmation is needed of some apparently well established stratigraphic schemes (especially in northern and East Greenland); and the nomenclature for certain intervals (e.g., the Eleanore Bay Group of East Greenland) has been "frozen" through usage at a reconnaissance level of sophistication that does not conform to the Stratigraphic Code. Clearly, many years of work lie ahead.

A few "little" things were missed by this reviewer, such as a description of the famous Skaergaard intrusion (an account of the study and concepts is presented). And why not a note on the meteorites taken from the Cape York region in 1897 and earlier by Peary? The giant "Ahnighito" meteorite, the largest (31 tons) in any museum collection, and the others are surely now part of Greenland's geology, even though extra-terrestrial and no longer resting at their place of landing on the earth. Finally, credits should be given for more of the outstanding photographs in a book of such artistic merit.

To sum up: the book provides a well-balanced and authoritative treatment of its subject. The type is clear and of generous size, the diagrams well drawn and relevant, and the photographs excellent. Altogether it is a work of which the authors, editors and entire staff of the Geological Survey of Greenland can be proud. And for an outlay of less than forty dollars the reader has very good value for money.

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