

reviews

Geological survey of Greenland

J. Sutton

Geology of Greenland. Edited by Escher and Watt. Pp. 603. (Geological Survey of Greenland: Østervoldgade 10, DK-1350 Copenhagen K, Denmark, 1976.) DKr.195 inc. postage.

COMPARED with many parts of the Solar System, the Earth is a protean creature, in a constant state of change. With such activity and destruction, Earth-bound geologists can never hope to find a landscape carpeted, as on the Moon, with fragments which have lain undisturbed for 3,000 Myr. Yet just occasionally geological circumstances combine to provide an unusually clear view of the geological past. The coastlines of Greenland, scraped bare by an ice sheet which has now drawn back to reveal fresh rock, provide unparalleled opportunities for geological research. This splendid book shows how successfully the Geological Survey of Greenland has grasped these opportunities during its first 30 years of activity.

As Dr Ellitsgaard-Rasmussen, who has directed the Survey for most of this time, points out, the Arctic climate and isolated situation require the mounting of special expeditions to carry out geological research in Greenland. The twenty-one chapters provided by some thirty contributors, most of whom have worked with the Survey, show how ably the staff have mastered logistical problems. With no fuss and great efficiency the Survey moves, feeds and supports its geological parties who are thus able to concentrate on scientific work, and who have surveyed, at least in outline, the entire mountainous seaboard bordering the world's largest island.

The opening sentence of the Director's preface puts the matter with characteristic plainness and brevity: "*Geology of Greenland*", he writes, "aims to provide a concise modern account of nearly all aspects of Greenland's geology". It does precisely this, drawing almost entirely on recent work while recognising the achievements of the pioneers, from the days of Giesecke in the early nineteenth century to the expeditions of Lauge Koch, Wegmann, Watkins and Wager more than a hundred years later.

Every chapter comes at first hand from experts who have been repeatedly to the terrain they describe. Each provides a readable narrative between a dozen and sixty pages in length, excellently illustrated. The figures (there are 470) include a variety of geological sketch maps and photographs that demonstrate the clarity with which geological phenomena are displayed in Greenland. The authors reflect the international nature of the enterprise. The Survey collaborates with more than fifty Universities and Institutes, and moreover does so with a generosity and openness which has attracted able scientists from many countries. The heart of the undertaking lies, however, in Denmark. It is Danish resources and leadership that have brought the Geological Survey of Greenland to its present eminence. Readers of this book have plenty of material on which to assess this judgement.

The opening chapters will appeal to the student of crystalline rocks. Here are described the Archaean and Proterozoic rocks which form the mass of Greenland. The main divisions established in Greenland can be extended into Canada and north-western Europe, and so provide a key to a unified view of the Precambrian of much of the Northern Hemisphere. Of even greater importance, perhaps, is the insight into geological processes of those times, made possible by careful study of excellently displayed terrain. These chapters could influence scientific thought in the way the British Geological Survey's work on Tertiary volcanic centres early this century influenced

the development of petrology. In each instance accounts of newly discovered phenomena prompt inquiries into their origin. One thinks of Bowen's use of British investigations some fifty years ago. An equal opportunity is provided here.

But this is no more than the first course. There follow chapters on the younger rocks of the east, north and west coasts, each of which developed somewhat differently, although all illustrate what may happen before and during the separation of continental blocks. The evolution of eastern Greenland is taken in three excellent chapters from late Precambrian times to the late Tertiary. A similar time span is covered in an account of northern Greenland which provides the first synthesis of that region based on detailed observation. Petroleum prospects, although still at an early stage, are suggested by the accounts of sedimentation around the Greenland coasts, which include short reference to commercial work offshore.

An account of the glaciation and Quaternary history of Greenland completes the geological record of this remarkable island. About fifty pages are devoted to economic minerals, coal and petroleum, followed by an equal number in which plant and vertebrate fossils are described. The book ends with an account of the kimberlites of western Greenland.

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Essence of Iceland

The Landscapes of Iceland: Types and Regions. By H. Preusser. Pp.xvi+363. (Junk: The Hague, The Netherlands, 1976.) DGu120.00.

REGIONAL geography encompasses the systematic patterns of landscape: the physical form and structure, the heat and water available through the seasons and the resulting biotic and human development. Most essays in regional

geography describe the physical characteristics of landscape as a platform or stage on which the life styles of work and play are integrated into a cultural pattern over the environment, increasingly controlled by complex economic forces. If these components are well drawn and emphasis is duly apportioned to each, and differences across regional boundaries are correctly discerned, the essay is then greater than the sum of