

Introduction

This volume has arisen out of the symposium "Did Greenland drift along Nares Strait?", which was a special session of "Halifax '80" — the annual meeting of the Geological Association of Canada and the Mineralogical Association of Canada, held at Dalhousie University, Halifax, Nova Scotia, May 19–21, 1980. The symposium was organised jointly by the Geological Survey of Canada (GSC) and the Geological Survey of Greenland (GGU) and co-chaired by the undersigned and R. K. H. Falconer.

Planning for the Nares Strait symposium began in early 1979 and by summer circulars inviting contributions had been sent to persons and institutions known to have a direct geological interest in the Nares Strait region. The main aim of the symposium was to resolve the question "Did Greenland drift along Nares Strait?". Papers from all branches of geology and geophysics which had a bearing on the structure and history of Nares Strait were solicited. We particularly encouraged scientists based in North America and in Denmark to collaborate in writing papers that dealt with both sides of the Strait. We were confident that the meeting would provide the most up-to-date information from the region, hopefully inspire new discussion and understanding, and reveal where more work needs to be carried out. It was hoped that the symposium might reach a meaningful consensus on the question of displacement in Nares Strait.

The symposium programme consisted of 18 papers which were delivered as lectures, and a concluding address by 'referee' M. J. Keen of the Atlantic Geoscience Centre. Those 18 papers are presented in this volume, with some titles and authorships differing from the abstracts published in the "Halifax '80" programme. During the planning of the symposium it became clear that in addition to the papers which could be presented at Halifax, many other relevant data were available and as a result this volume contains 30 papers.

The papers are grouped into seven sections, although there is naturally subject overlap between the sections.

- 1) *History*. The two papers of this section set the scene for the discussion of the main topic of the Nares Strait symposium; a history of exploration and geology leads to the specific question of the Nares Strait conflict and its regional implications.
- 2) *Physiography*. Two papers evaluate the Holocene physiographical aspects of the Nares Strait region; present-day physiography and postglacial emergence are viewed in terms of fault activity along Nares Strait.

- 3) *Stratigraphy*. This section of seven papers describes the main elements of the onshore Precambrian to Cenozoic stratigraphy on both sides of Nares Strait. The papers are arranged chronologically and they examine the stratigraphy in terms of the relative positions of Ellesmere Island and Greenland.
- 4) *Structure*. The eight papers of this section describe the structural, and some stratigraphic, features of the Nares Strait region. The first four papers discuss the onland Palaeozoic and Tertiary structural pattern; the remaining papers formulate a more regional tectonic appraisal of Nares Strait and its role in the North Atlantic.
- 5) *Geophysics*. The eight papers grouped here discuss seismic, gravity and magnetic data from both the marine and onshore areas of Nares Strait and the adjacent seas. The majority of papers assess the information in terms of plate tectonic models for the region.
- 6) *Economic geology*. This paper discusses some implications of the Nares Strait debate on petroleum exploration of the region.
- 7) *Summary*. Two sequel papers that summarise the arguments presented for and against Nares Strait being the site of major strike-slip displacement between Greenland and North America.

Many papers in the volume treat Nares Strait in the context of sea-floor spreading and plate tectonics. In some of these a magnetic polarity time scale is used as a framework with which to describe the timing of geological events. An attempt to adopt but one of the many geomagnetic time scales as a standard for the volume was deemed 'impracticable'. Instead, to effect an easier correlation of the time frameworks presented in the different contributions, a comparison of the various geomagnetic time scales is given in an appendix.

Editorial policy of *Meddelelser om Grønland* has been followed in this volume, and all contributions have been critically reviewed by referees. However, since the volume is essentially the proceedings of a symposium, the manuscripts were accepted as resubmitted by the authors, without additional comments on the scientific content. Thus, the authors alone are responsible for this aspect of their papers. Presentation in *Meddelelser om Grønland* style led to standardisation of certain spellings, as well as changes to authorised place names. However, because authors' intentions when describing geological time or time units were not always apparent, no attempt was made to standardise stratigraphical terminology, such as "early", "Late", "Upper" and

“lower”. References have been consistently ‘spot-checked’ and inspected for general clarity but many have not been scrutinised for accuracy — this remains the responsibility of the authors.

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All the ‘technical’ editing of the material has been carried out at GGU in Copenhagen. We owe special thanks to Esben Glendal for his scrupulous preparation of the manuscripts and his many suggestions for their

improvement. His contribution also includes typing and retyping of more than half of the papers, and assistance in proof checking. Jakob Lautrup and assistants carried out much of the photographic work including reduction of figures to format size, while Gurli E. Hansen, Grethe Haugaard, Ulla Lundblad, Annette T. Rasmussen and Bodil Sikker-Hansen are thanked for drafting work. The aerial photographs which appear as figures are the copyright of the Geodetic Institute, Denmark, and the National Air Photo Library, Canada. We are grateful to the following institutions for providing the photographs included in the frontispiece: The Allen County Public Library, Fort Wayne, Indiana, U.S.A. (F. B. Taylor); H. Hirschsprungs Forlag, Copenhagen, Denmark (A. L. Wegener); The Museum of the King’s Own Royal (Lancaster) Regiment, England (H. W. Feilden) and The Royal Geographical Society, London (G. S. Nares).

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