GENERAL REVIEW OF THE SURVEY'S ACTIVITIES IN 1970

The Geological Survey of Greenland continued in 1970 to carry out its three main tasks – the geological mapping of Greenland, the investigation of mineral deposits of economic interest and the publication of results. In addition the Survey has acted as geological adviser to the Ministry for Greenland in matters concerning the granting of mineral exploration concessions.

Geological mapping

Three categories of geological maps are published by the Survey:

1) Regional maps at scales 1 : 500 000 and 1 : 2 500 000
2) Survey map sheets at scale 1 : 100 000
3) Detailed maps of selected areas

Regional maps

A new tectonic/geological map of Greenland at 1 : 2 500 000 was published in 1970.

A new Quaternary map of Greenland at 1 : 2 500 000 which has been planned as a supplement to the tectonic/geological map at the same scale is in proof and will be published early in 1971.

It is planned to cover the whole of West Greenland in four geological map sheets at 1 : 500 000. The first of the four sheets is in press and will be published in 1971.

The Survey is also collaborating in the production of a metallogenetic map of North America and the second edition of the Tectonic Map of Europe both of which will include Greenland.

Survey sheets at 1 : 100 000

Map sheets at 1 : 100 000 are the main repository for the results of field mapping in Greenland. The map sheet Mârmorilik has been printed in 1970. The sheets Nûgâtsiaq and Pangnertôq were in proof at the time of writing and the sheets Nanortalik and Narssarssuaq are completed in manuscript form.

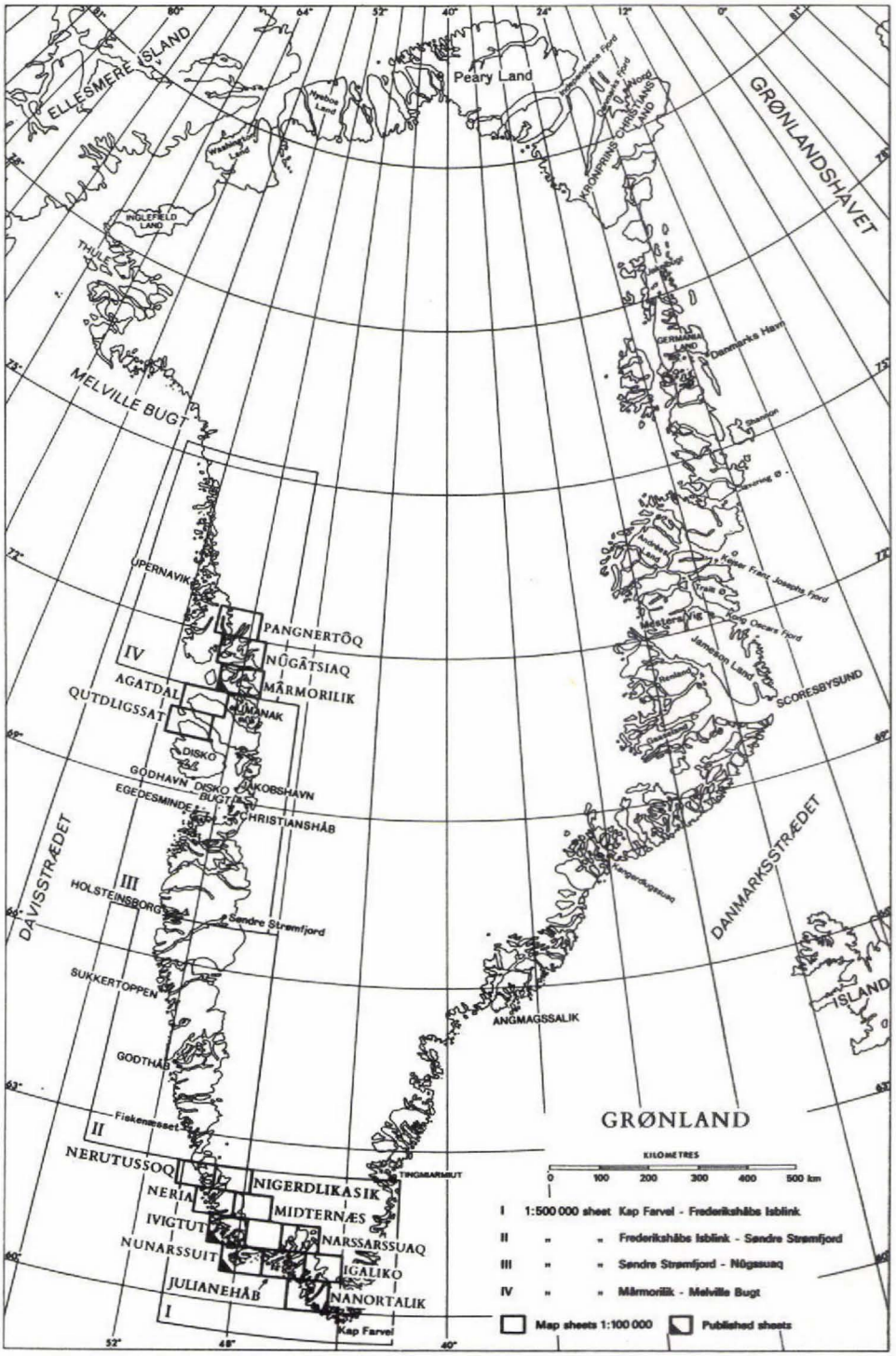
ELLESMERE ISLAND
Peary Land
GRØNLANDSHAVET
INGLEFIELD LAND
THULE
MELVILLE BUGT
UPERNAVIK
PANGNERTÔQ
NÛGÂTSIAQ
MÂRMORILIK
IV
AGATDAL
QUTDLIGSSAT
UMANAK
DISKO
GODHAVN
DISKO BUGT
JAKOBSHAVN
EGEDESMINDE
CHRISTIANSHÅB
DAVISSTRÆDET
III
HOLSTEINSBORG
Søndre Strømfjord
SUKKERTOPPEN
GODTHÅB
Fiskenæsset
II
NERUTUSSOQ
NERIA
IVIGTUT
NUNARSSUIT
JULIANEHÅB
I
NIGERDLIKASIK
MIDTERNÆS
NARSSARSSUAQ
IGALIKO
NANORTALIK
Kap Farvel
TINGMARMIUT
ANGMAGSSALIK
SCORESBYSUND
DANMARKSSTRÆDET
ISLAND
GRØNLAND
KILOMETRES
0 100 200 300 400 500 km
I 1:500 000 sheet Kap Farvel - Frederikshåbs Isblink
II " " Frederikshåbs Isblink - Søndre Strømfjord
III " " Søndre Strømfjord - Nûgssuaq
IV " " Mârmorilik - Melville Bugt
Map sheets 1:100 000
Published sheets

Fig. 1.

Economic-geological investigations

The Survey has assisted several private companies that have exploration concessions in Greenland. The companies have been provided with maps and information from areas in which they are working. The Survey has also corresponded with a large number of foreign companies concerning economic possibilities in Greenland. As a result of these efforts 18 new concessions were granted in 1969 by the Ministry for Greenland and the total number of companies operating in Greenland is now 39.

The Survey has continued routine studies of various potential mineral resources, e.g. uranium, thorium and zirconium in the Ilímaussaq intrusion near Narssaq. This work is carried out in close cooperation with the Atomic Energy Commission's Research Establishment at Risø.

Apart from these special studies records of mineralisations have been kept in the course of the regional field mapping, and companies holding concessions have been supplied with metallogenic observations.

Preliminary results of magnetic and gravity surveys undertaken in the summer of 1969 in the Itivdle valley in north-western Nûgssuaq indicate a depth to basement of about 2000 m. This work supplements earlier work in the petroleum prospects of the area.

The Survey provided published and unpublished information to numerous representatives of oil companies interested in petroleum prospects in and around Greenland. Many of these companies hold prospecting licenses for petroleum under the act on mineral resources in Greenland.

The director, as a member of an advisory working group under the Ministry for Greenland, has participated in the arrangement of a considerable number of questions concerning the granting of concessions for exploration and exploitation of minerals in Greenland.

Expeditions

In all 113 persons participated in the Survey's activity in 1970. The biggest group operated in the Scoresby Sund area, East Greenland. This group consisted of 16 two-man geological parties and the whole operation was based on m/s "Perla Dan". The parties were supported by two helicopters which operated from the ship's two heliplatforms.

The main activity in West Greenland was in the Fiskenæsset area where 10 two-man geological parties were supported by two cutters and two helicopters operating from the new base camp near Fiskenæsset.

In West Greenland the study of permafrost was continued. A new station was set up at Egedesminde. The measurements of the depths of the permafrost table by geoelectric methods was continued in the Holsteinsborg area.

The study of ore minerals in late-Ketilidian basic and layered hornblende peridotite

intrusions was continued. Systematic magnetic investigations were made in one of these bodies.

Collaboration with other institutes

The Survey has continued to maintain a close contact with a large number of other institutes, both Danish and foreign, in order to benefit from the sharing of resources and the exchange of ideas. In keeping with this policy the Survey has in the past year collaborated with the Mineralogical-Geological Institutes and Mineralogical Museum of the University of Copenhagen, the Danish Atomic Energy Commission, the Geological Institute of the University of Århus and the Geotechnical and Mineralogical Institutes of the Technical University in Copenhagen. Furthermore the Survey field team was joined in 1970 by geologists from the universities of Alberta, St Andrews, Bern, Exeter, Keele, Lausanne, Leicester, Liverpool, Modena, Prague, Washington and the College of Technology of Portsmouth.

A collaboration on heat flow investigations in the crust of South Greenland has been started with geologists from the Geothermal Studies Project of the U. S. Geological Survey.

In July Dr. F. C. Taylor of the Geological Survey of Canada joined survey parties around Fiskenæsset, Frederikshåb and in the Julianehåb district as part of a joint programme between G. G. U. and the G. S. C. started in 1969 for the comparison of the shield areas at either side of the Davis Strait.

The Director and one geologist represented G. G. U. at a meeting of Norwegian geologists to discuss possibilities of cooperation with a Norwegian project to investigate the ocean floor between Norway and Greenland.

Much of the work in Greenland forms not only part of the Survey mapping programme but also a contribution to various international research projects. Work has continued on projects forming part of the Danish programme for the International Upper Mantle Project and UNESCO's International Hydrological Decade.

Organisation and personnel

The permanent scientific staff of the Survey in 1970 consisted of 17 geologists and 1 chemist. During the field season this team was supplemented by 24 geologists from other institutes (see above) and 12 senior students. The permanent supporting staff in Copenhagen numbers 27; this figure is relatively low due to the sharing of many facilities with the Mineralogical-Geological Institutes and Mineralogical Museum. The total number of participants (geologists and supporting staff) in the summer expeditions was 113 together with 25 Greenlanders.

A small working unit was set up to deal with the steadily growing number of tasks of economic-geological character. Moreover it is planned to enlarge this unit in the near future in such a way that the most important areas of economic geology can be covered to a satisfactory extent.

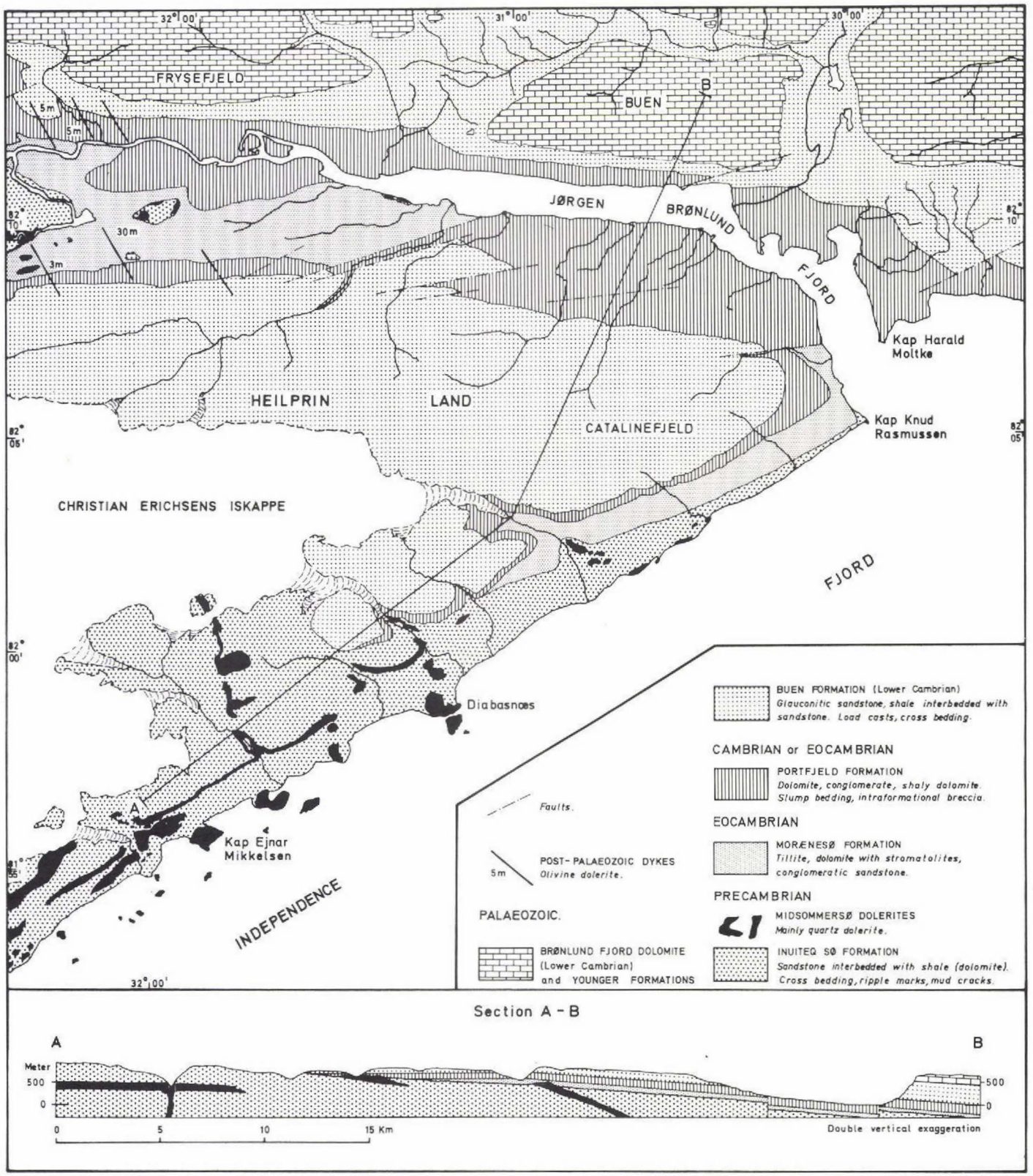

Fig. 2. Simplified geological map of the eastern part of Heilprin Land. Map and section are on the same scale.

Finally it should be mentioned that practical arrangements to meet the rapid increase in the pressure of work which already has been felt, and can be expected to continue, as a result of the passing of the act on mineral resources, have been under consideration.

K. Ellitsgaard-Rasmussen
Director

NOTES ON THE PRECAMBRIAN TO LOWER CAMBRIAN STRATIGRAPHY OF THE SOUTH-EASTERN PART OF HEILPRIN LAND, INDEPENDENCE FJORD, NORTH GREENLAND

Hans F. Jepsen

As a member of the 7th Danish Peary Land Expedition in the summer of 1970 led by Count Eigil Knuth, the author had the opportunity to study a section through the Precambrian, Eocambrian and Lower Cambrian strata along the south-eastern shore of Heilprin Land (fig. 2). The main purpose was to examine the Precambrian Midsommersø dolerites (see below), and also to map the sedimentary formations of the area. This report describes the results of the mapping.

In 1966 and 1968 the area west and north-west of Independence Fjord around Jørgen Brønlund Fjord and Midsommersøerne was mapped (Jepsen, 1969). The approx. 1000 m thick sedimentary sequence below the Lower Cambrian Brønlund Fjord Dolomite (Troelsen, 1949, pp. 13-15) was divided into four formations (Jepsen, in press) – in ascending order: Inuiteq Sø Formation (sandstone, at least 230 m, Precambrian), Moræneso Formation (tillite and dolomite, 0 to 117 m, Eocambrian), Portfjeld Formation (dolomite, 206 m at the type locality, Eocambrian or Lower Cambrian), Buen Formation (sandstone and shale, 425 m at the type locality, Lower Cambrian). The first three named formations are separated by unconformities both of which represent long erosion periods. The strata are cut by two dolerite sequences of which the oldest (the Midsommersø dolerites) is of Precambrian age and intrudes only the Inuiteq Sø Formation. Intrusions of the youngest sequence penetrate all the strata in the area and are regarded as post-Palaeozoic. With a nearly constant thickness (575 m to 631 m total) the Portfjeld and Buen Formations were found to be distributed over the whole mapped area, which is about 2500 km^2 with an east-west extent just under 90 km (Jepsen, in press, plate 1).

In 1970 this stratigraphy was followed south-westwards along the shore of Heilprin Land (fig. 2). Here again, the oldest beds belong to the Precambrian Inuiteq Sø Formation, which west of Kap Ejnar Mikkelsen attains a thickness of at least 800 m.