array or equivalent, and the cable will be a 2400 m, 48 group streamer or equivalent. The configuration of the shooting geometry will be such that a 48-fold CDP coverage can be achieved. The seismic work will be carried out by a seismic contractor.

Data processing and interpretation

The seismic data will be submitted for standard processing by a seismic data processing contractor. Certain lines may later be selected for special processing or migration.

All available data will be integrated in the interpretation. The aim will be to produce, depending on the area, contoured two-way travel time maps of the acoustic basement and of some of the sedimentary horizons. True depth maps will be produced as required, based on a study of the velocity data from both reflection and refraction seismic data. A study of seismic stratigraphy will be made and an attempt will be made to establish the stratigraphy of the offshore area on this basis.

Data on the ice, weather and sea state will be evaluated during the project to the extent that it is relevant to the current work and to decisions on the feasibility of future exploration activity in this area.

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Airborne remote sensing in East Greenland

Tage Thyrsted

In the spring of 1979 a remote sensing project in East Greenland was commenced, introducing this new method of investigation to Greenland. The aim of the project is to investigate the possibility of using airborne remote sensing in connection with mineral exploration. In the region chosen for investigation (Inset, fig. 35) several mineralisations of different types and ages occur, and the purpose is to find out which remote sensing techniques and data processings are appropriate for detection and reproduction on images of these known mineralisations. The region is geologically well known and it is well exposed, vegetation and secondary cover being very limited.

The project is being carried out as a joint French-Danish operation between Groupement pour le Développement de la Télédétection Aérospatiale (GDTA), Toulouse, and GGU. GDTA is in charge of the technical work and some interpretation while the main contribution of GGU is of an interpretative character.

The time schedule for the project can conveniently be divided into three parts: planning of the operation, field work with acquisition of data, and data processing. The field work has already been carried out, while data processing is at a preliminary stage and should be completed by the end of 1980.

Geological aspects

Within the region five test areas (fig. 35) were selected for investigation, each area representing a particular type and age of mineralisation. Each test area comprises (1) one or two key areas with known mineralisations, and (2) a survey area comprising rocks similar to the rocks in the key areas. The five areas and their mineralisations are briefly described below:

A. Hydrothermal lead-zinc mineralisation associated with Tertiary quartz veins occurring within continental Carboniferous – Lower Permian sediments. The key area comprises the Mesters Vig lead mine and Sortebjerg; the survey area comprises the Carboniferous–Permian sediments from Hall Bredning to Clavering Ø.

B. Pneumatolytic molybdenite mineralisation associated with Tertiary porphyritic granites. The key area comprises the Malmbjerg and Mellempas intrusions; the survey area comprises the Tertiary intrusions extending from Malmbjerg to eastern Traill Ø.

C. Stratabound mineralisation of lead, zinc, barium, and copper in Upper Permian – Triassic marine sediments. The key areas are the Bredehorn area and Wegener Halvø (respectively C and C' in fig. 35); the survey area makes up the Permian–Triassic sediments in northern Jameson Land.

D. Stratabound copper mineralisation in late Precambrian geosynclinal sediments (Eleonore Bay Group). The key area is situated at Holme Sø, Strindberg Land; the survey area comprises the extent of the Eleonore Bay Group.

E. Various mineralisations of pre-Caledonian to Caledonian age. Most important is a scheelite mineralisation, possibly associated with late Caledonian granitic intrusions. The key area is around Alpefjord; the survey area comprises a section across the Caledonian fold belt.

Technical aspects and operations

The equipment used for the data acquisition consisted of two multi-spectral scanners. A Daedalus DS-1250 scanner with seven channels covered the visible and near-infrared part (0.5–1.1 µm) of the electromagnetic spectrum. This scanner has an effective field of view of 77°; the scan rate was 20 scans per second and the resolution 2.5 mrad. The second scanner

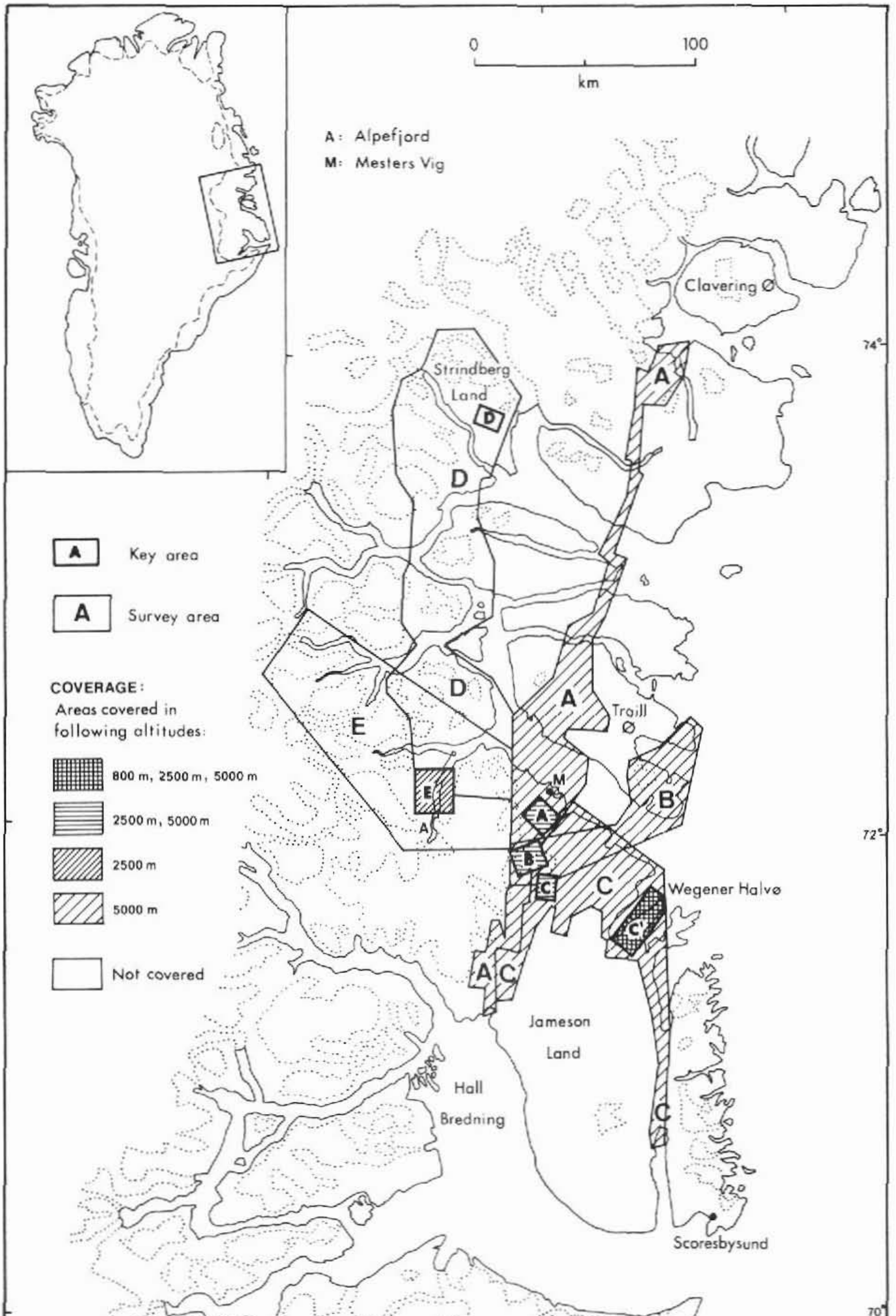

Fig. 35. Map showing the extent and coverage of the test areas. For reasons of space, the place names of key areas A, B, C, and D are not shown.

was a Super Cyclope SAT scanner with two channels in the thermal infrared part (8.5–12.0 μm) of the spectrum. The field of view for this scanner is 90° and the resolution 1.7 mrad. The scanner platform was a Boeing B-17 aircraft.

During the field operation the key areas were covered by low level flights, while the survey areas, including the key areas, were covered by high level flights. The purpose of this operation was to investigate the effect of decreasing resolution when going from low to high level flights, and to compare information obtained from the key areas investigated in detail with information from the regional survey areas.

The actual flight altitudes were, in the case of the low level flights, determined by the resolution of the scanner instruments and by the size of the mineralised zones and bodies, while those for the high level flights were determined more on the basis of the technical capabilities of the aircraft and on considerations of expense. On this basis it was decided to overfly the key areas at 800 m and 2500 m above ground and the entire test areas at 5000 m above ground. At these altitudes the ground resolutions are respectively 2.4 m, 7.5 m, and 15 m for the Daedalus scanner, and 1.4 m, 4.3 m and 8.5 m for the SAT scanner, which are comparable to the general sizes of the mineralised zones in the region. For technical reasons the 800 m level flights were restricted to key area C' at Wegener Halvø.

Results

Bad weather conditions during the 3½ week season in August 1979 prevented the completion of the programme. The three most important areas, however, were covered completely. Fig. 1 indicates the coverage, showing that the areas A, B, and C were covered at 2500 m and 5000 m altitude. In addition key area C' was covered at 800 m and key area E at 2500 m. The area covered amounts to 12 800 km^2 which represents 9.25 hours of data acquisition.

Data processing

Most of the data processing will take place at GDTA in Toulouse. A series of standard procedures will be carried out before interpretation. These procedures consist of: (1) conversion of analog data acquired in the field to digital data on the so-called Computer Compatible Tapes (CCT); (2) correction for systematic distortion; (3) superposition of SAT data on Daedalus data whereby all nine channels can be treated concurrently; and (4) superposition of SAT plus Daedalus data onto topographic maps for selected areas. For the interpretative part, two methods of processing are available at GDTA. An interactive method can be used on an image facility system called TRIM, on which contrast enhancement, composite colour images, and density slicing can be produced. The other method is a batch process on which the more statistical procedures like classification and ratioing take place.

As mentioned earlier the data processing part of this project has just commenced. It is hoped before the end of 1980 to be able to put forward some concrete results on the detection of the mineralised zones and bodies.

Acknowledgement

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Observations on Upper Permian sediments in southern Scoresby Land, East Greenland

Lars Stemmerik

Investigation of the Upper Permian sediments in East Greenland initiated in 1978 (Stemmerik, 1979) was continued during the field season 1979. The investigations were centred around Revdal and Schuchert Dal, but Oksedal, Depotø and Gauss Halvø were visited as well (fig. 36).

The deposits of Revdal are situated close to the western margin of the Permian basin,

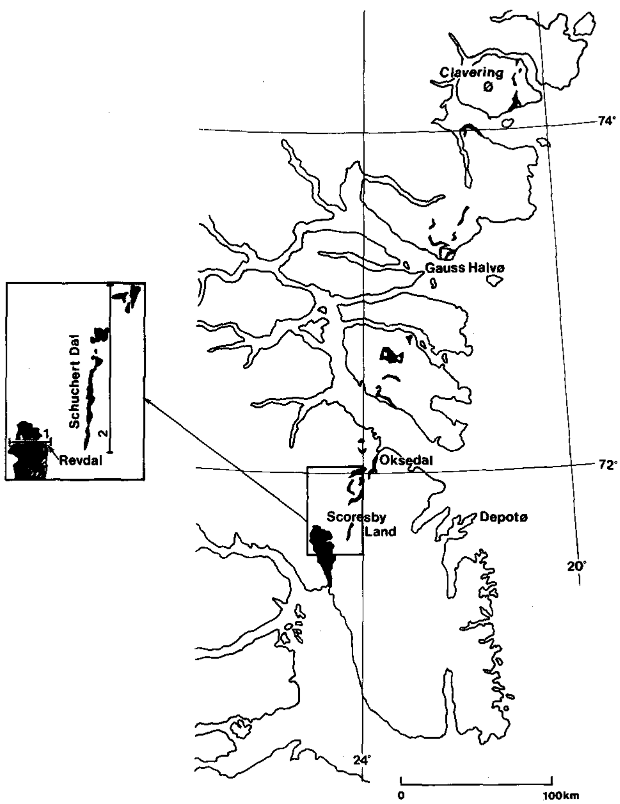

Fig. 36. Distribution of Upper Permian sediments in East Greenland.