

Kap Stewart Formation

This formation is generally poorly exposed for sedimentological studies and only two good sections were encountered. The sediments in question consist of thick sequences of black thinly laminated mudstones, flaser laminated silty sandstone, large-scale cross-bedded often pebbly sandstone, horizontally laminated sandstones, and wave-rippled sandstones. Both fining-upwards and coarsening-upwards sequences occur. Marine(?) trace fossils and bivalves appear locally. Palaeocurrent measurements of foresets gave a bipolar orientation with the strongest mode towards the south.

The depositional environment for this formation is believed to be a tidally influenced delta. The climate during deposition of the Kap Stewart Formation was humid and contrasts to the overall dry climate prevailing during deposition of the Gipsdalen and Fleming Fjord Formations.

References

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Uranium exploration in northern East Greenland

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The uranium prospecting programme between 72° and 76°N which commenced in 1973 (Nielsen & Larsen, 1974; Nielsen & Steenfelt, 1975) was continued in 1975 from GGU's base at Stordal in Hudson Land. The programme included detailed geological and radiometric investigations in areas of high radioactivity as well as geochemical sampling.

Geological and radiometric work

Previous work, mainly airborne gamma spectrometry and regional geochemical sampling, indicated that the acid extrusive rocks of Devonian age are important source rocks for

uranium mineralisations. Therefore the majority of the field work in 1975 was concentrated on these rocks.

One field team (M. Ryan, Portsmouth, England, and J. Sandwall, Luleå, Sweden) visited nearly all the major outcrops of acid volcanic rocks to make petrographical descriptions and scintillometer measurements. Representative samples of every rock type will be analysed for uranium. The results of this work will contribute to the evaluation of the uranium potential of the continental Devonian–Carboniferous sedimentary basin north of Kejser Franz Josephs Fjord.

Much field activity was concentrated in Randbøldal, Gauss Halvø, where carburan mineralisations within Devonian quartz porphyries were discovered in 1974 (Secher, Nielsen & Steenfelt, this report). The geology of the whole Randbøldal area was mapped at a scale of 1:10 000 by T. Thyrsted, and selected areas containing the mineralisations were surveyed in detail by gamma spectrometer (P. Sørensen, Risø, Denmark) and scintillometer. The results indicate that the mineralised areas are scattered and of limited surface extent. Further work will include trenching of the largest mineralisations. The geochemical work undertaken by W. Koensler, (Aachen) comprised dense sampling of stream sediments, stream water, and soil. In addition samples were taken at regular time intervals throughout the season to control seasonal variations of sampling media.

Some new, but small uranium mineralisations associated with Devonian acid lavas were discovered near Hochwacht, north of Moskusoksefjord during the inspection by the author of an anomaly recorded in the airborne spectrometric survey of 1974. The volcanic rocks form an 800 m long steep ridge surrounded by Devonian sediments. The ridge is believed to be a remnant of a former vent system in which three or four successive vertical or steeply dipping intrusions have been recognised. Mineralisation is associated with fractures and fissures which follow a strongly developed flow banding. The showings are characterised by the yellow secondary uranium mineral beta-uranophane, but in contrast to Randbøldal no carburan has been found. The high count rates recorded by the scintillometer suggest the presence of uranium-rich primary minerals.

An extensive sheet of volcanic rocks, predominantly lava, was discovered west and south of Hochwacht. These lavas are probably related to the volcanism of the vent. The sheet was extruded upon, and is overlain by, Devonian sandstones. The radioactivity of the lavas is relatively high, and thus they will be a target for further prospecting.

Geochemical sampling

The geochemical programme of 1974 showed that both stream sediments and stream water are useful sampling media in geochemical prospecting within the arctic environment of East Greenland. The results also indicated that intensified regional prospecting should be focused on Hudson Land and Gauss Halvø. The programme in 1975 (undertaken by the author and W. Koensler, Aachen) comprised sampling the stream sediments and stream water with a density of sample per 2–5 km² in sub-areas of Hudson Land and Gauss Halvø. A denser sampling of the same media and of soil was undertaken in the vicinity of the volcanic rocks at Hochwacht.

A special geochemical investigation was carried out in a small area of the northernmost part of Kuhn Ø, where high contents of uranium were detected in 1974 in stream sediment

and water draining an area in which post-Caledonian granite has intruded the Eleonore Bay Group. The stream sediment samples collected this year also show high contents of uranium, but no mineralisations were found during the field work.

References

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Uraniferous hydrocarbons (carburan) associated with Devonian acid volcanic rocks, Randbøldal, northern East Greenland

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Uranium mineralisations were discovered in acid volcanic rocks in Randbøldal, Gauss Halvø, during field work in 1974 following an airborne radiometric survey (Nielsen & Steenfelt, 1975). The geology of the area has been described by Büttler (1954), Graeter (1957) and Alexander-Marrack & Friend (1976).

Field description

Uranium occurs in the lower volcanic member of the Kap Franklin series of Middle Devonian age. Quartz porphyritic rhyolites and pyroclastic rocks are intercalated with continental sedimentary formations which represent the molasse of the main Caledonian orogeny. Among the major radioactive constituents, only carburan has so far been identified in the rhyolites and tuffaceous breccias. The mineralisations are located within an area of about 1 km², and the individual outcrops of high radioactivity cannot usually be followed for more than 20 m. The mineralisations are often found close to the boundary of an overlying pyroclastic unit.

The carburan has three principal modes of occurrence:

- (1) in joints, veinlets and along grain boundaries,
- (2) as isolated globular or amoeboidal grains with diameter in the range 1-5 mm,
- (3) disseminated or sometimes as clusters, with individual grain sizes usually less than 1 mm.

Fig. 35 illustrates an autoradiography showing the distribution of radioactive compounds in occurrence of types 1 and 3 in a quartz porphyritic rhyolite. The orbicular quartz