DAVID MALMQVIST'S TRAVELS

DAVID MALMQVIST was engaged as a member of the expedition in the four summers 1931—34 to carry out prospecting and investigations to find out whether any economically valuable minerals occurred. Our knowledge of the geology of central East Greenland was then still rather slight, so his work was pioneer work, and he had to take the chances that presented themselves. Sometimes he had to carry out topographical mapping, and in measuring geological sections, extending from the Devonian to the Cretaceous, he found valuable fossils, which were useful for the work of other members of the expedition. In his diaries we find a number of scattered observations of Caledonian rocks, notably gneisses and granite, and of Tertiary basalts, as well as older eruptives. Many of his observations have been of use for the later investigations.

The summer of 1931.

An American tourist had some time before made observations which he took to be indicative of the occurrence of oil. Although this seemed little probable, private means for an investigation of this problem, to be undertaken by MALMQVIST, was secured.

1) August 5th—7th. Together with some other geologists MALMQVIST investigated the previously known Permian and Triassic beds east of Eskimonæs and measured various sections.

2) Investigation of the Triassic and Cretaceous beds south of Finsch Øer. In the days August 9th—13th sections were measured from the shore to the lower boundary of the basalt, and hitherto unknown Cretaceous fossils were collected.

3) August 14th—19th. Investigation of the Carboniferous beds on the west side of Clavering Ø (Hallebjergene). Sections through beds of a thickness of 900 m were studied here. Beds with plant fossils were found, and sulphur and copper pyrite were ascertained in the crystalline rocks.

4) August 21st—24th. Investigation of the Devonian and Carboniferous beds around Celsius Bjerg on Ymers Ø and at Margrethedal north of Kejser Franz Josephs Fjord.

5) August 26th—29th. Investigation of the Devonian basal conglomerate on Lyells Land and measurement of sections in the southern part of Kongeborgen through Devonian and Carboniferous sediments, assisted by other geologists.

It will be seen from the above, that in the course of the summer MALMQVIST investigated Devonian, Carboniferous, Permian, Triassic, and Cretaceous sediments in a number of localities, but in none of the sections he found the slightest trace of oil-bearing beds. The investigation at the western part of Clavering Ø is published in M. o. G. Bd. 94 Nr. 6. Various basalt samples are partially described in M. o. G. Bd. 87 Nr. 5.

The summer of 1932.

In the summers of 1929, 1930, and 1931 fairly extensive rust zones had been observed in the southern part of Clavering Ø. It was therefore decided to borrow apparatus for electrical ore prospecting from the A/B Svensk Malmletning, and by means of these apparatus MALMQVIST, together with H. BACKLUND and O. EKLUND, were to undertake a thorough investigation of the mineral occurrences there.

1) On July 15th MALMQVIST, in company with BACKLUND, climbed the northeast side of Bontekoe Ø, which is evidently made up of younger basalts, though blocks of highly transformed and caolinised sandstones were found. Above the series occurred plagioclase basalt, and higher up lava with 1-metre-thick dykes of dense plagioclase basalt and coarse dolerite. Further, numerous zeolites (chabasite, phillipsite, and natrolite) were met with.

2) The electrical prospecting east of Eskimonæs was carried out in the days July 18th to August 9th. The equipment was transported by ponies to a height of ca. 600 m (see special report). The ore mineralisation seemed to be associated with feldspar-bearing quartz dykes crossing the N–S-striking garnet biotite gneiss. The pyritic rocks, comprising pyrite with some galena and molybdenite, were often much affected by weathering. It turned out to be very troublesome to dig down through the moving soil, the pit constantly caving in.

3) In the days August 11th—15th MALMQVIST, in company with BACKLUND and SEIDENFADEN, made a motorboat trip into the unknown Grandjean Fjord, which was mapped, and numerous observations were

made in the Caledonian, highly folded gneisses and granites and the silicified limestones and micaschists.

4) From August 16th to 24th the motorboat journey was continued. An attempt was made to push into Ardencaple Fjord, but it failed owing to bad weather. So the boat went west of Kuhn Ø through Fligelys Fjord, with a visit to Lindemans Bugt and Albrechts Bugt, and onwards via Germania Havn to Eskimonæs.—The Caledonian rocks were studied in the southern Kuhn Ø. Huge dykes of ortoclase granite often pierced the old folding structures of the dark micaceous gneiss at fairly great angles, but often, also, the granite follows the folds. Collection of Mesozoic sediments were made, and the Caledonian rocks of Sabine Ø were studied.

The summer of 1933.

Owing to ice difficulties the expedition had to stay for some time near the colony of Scoresbysund.

1) From June 26th to July 13th MALMQVIST in company with O. EKLUND investigated the Caledonian rocks east of Kap Hope. An intrusive rock, a coarsely crystalline hornblende diorite, was observed, and further, diopside-bearing limestone with a number of minerals, i. a. graphite, which owing to its metallic colour was suspected to be molybdenite. On the later examination in the laboratory, however, the supposed molybdenite proved to be graphite.

2) From July 16th to August 6th MALMQVIST, EKLUND, and, as a rule, KAMMAN investigated the mineral-bearing rust zones north and northeast of Eskimonæs. These zones were preliminarily mapped on air reconnaissances, and excursions were made far inland, often up to 1300—1400 m altitude. Ponies were employed as far as possible, but the terrain presented great difficulties. As no map of this area was available, some mapping was undertaken. The samples collected were immediately analysed in the laboratory erected on the shore. The rust zones consisted of pyrite-bearing garnet gneisses, which seemed to be younger than the Caledonian rocks of which the central part of Clavering Ø is built up. Pyrite were found in large quantities often almost pure, and in dykes of considerable thicknesses. They were slightly gold-bearing. Silver and lead were also found, though in small quantities.

3) On August 7th—8th MALMQVIST and other geologists undertook a motorboat trip from the coast of Kuhn Ø to Hochstetters Forland. Investigations were made in the crystalline on the east side of Kuhn Ø.

4) On August 9th—11th MALMQVIST went ashore in several places on the east side of Store Koldewey and up to Danmarks Havn. In

Fig. 163. OLOF EKLUND and DAVID MALMQVIST ready for air prospecting. Clavering Ø 1933.

the southern part of Koldewey Ø he observed folded, more or less metamorphosed beds of the Eleonore Bay Formation. Opposite Lille Koldewey gneisses were met with, and west of Danmarks Havn gneisses with granite dykes, which contained small quantities of copper pyrite and pyrrhotite. Along the coast west of Danmarks Havn considerable quantities of large blocks occurred, consisting of a light-red sandstone with yellow spots and sometimes dark bands. These blocks are probably derived from the Petermann Series on Dr. Louises Land.

In the evening of the 11th a motorboat was lowered from the "Gustav Holm" off Skærfjorden, with MALMQVIST, THORVALD SØRENSEN, and KAMMAN on board; they were to make, respectively, geological and botanical investigations and mapping of the practically unknown Skærfjorden, and return to Danmarks Havn to meet the "Gustav Holm" on August 15th. The motorboat headed towards Kap Amelie, which was climbed in the morning of August 12th, and theodolite observations were made from 505 m altitude. The rocks were gneisses and quartzitic slates with dark biotite-bearing bands. Here, also, numerous blocks of hornblende gabbro containing fragments of gneiss were met with.

In the evening the boat turned into Penthievre Fjord, and in the morning of August 13th the party camped in Klægbugt. Slightly gran-

itised quartzitic slates were found here. In the afternoon topographic observations were made from C. Drost Ø, at a point at 378 m altitude. On the island garnet-biotite shales occur, with granite dykes, sometimes fairly thick. Blocks of coarsely crystalline quartz diabase were rather common.

On August 14th the party went out through Agsutsund and into V. Clausens Fjord, where a theodolite observation was taken at a altitude of 80 m.

In the evening of the 15th the boat went out of the fjord to Theodolitskær, where topographic measurements were made; subsequently the party proceeded into C. F. Mouriers Fjord, whence theodolite observations were likewise taken from an altitude of 80 m. Biotite shales, inconsiderably granitised, were met with. Near Kap Récamier a thick dyke of quartz diabase or diorite gabbro was observed. The party went ashore in several places, stayed for a while at Rekved Ø, and continued to Kap Marie Valdemar, where a peculiar dark hornblende gabbro occurs. It was not possible to ascertain whether this rock belongs to the Caledonian or a much younger series. At 10 o'clock in the evening the party left Kap Marie Valdemar, and arrived at 6 o'clock in the morning of August 16th at Danmarks Havn.

5) From August 21st—25th MALMQVIST, EKLUND, and MALMBERG made excursions in order to complete the mapping of rocks around Auspiciedalen. The topographic map of Skærfjorden is published in M. o. G. Bd. 101, Nr. 4.

The summer of 1934.

1) On July 30th MALMQVIST accompanied by six men were set ashore at Calamiteselv in Nathorsts Fjord. Richly fossiliferous Triassic beds were met with at an altitude of 650 m. Descended into the inner Cirkusdal to the southwest.

2) From the 2nd to the 6th of August MALMQVIST investigated the Devonian eruptives on the north side of Moskusoksefjord, where tuff and lava as well as dykes of quartz prophyries and eruption breccias, etc., were met with. An area of porphyry dykes in tuffs with apophyses was closely studied. Investigations were also made towards Torbern Bergman Bjerg, where gneiss granites with pegmatite dykes occur. Topographic measurements were commenced, but not completed owing to bad weather.

3) From August 9th to 19th an investigation was made, from motorboat, of the coast from Knudshoved on Hold-with-Hope southwards to Kap Broer Ruys, whence the party continued to Ella Ø. The work was much impeded by bad weather. Holland Ø was mapped geologically.

There occurred here, in addition to metamorphosed limestones and shales (Cretaceous?), gabbro and a few younger quartz veins. Thick dykes of augite porphyry were likewise mapped. At Kap Broer Ruys highly metamorphic light-green shales with dykes of olivine-trachybasalt and volcanic breccia occurred. Many porphyry blocks were found west of Kap Broer Ruys, evidently porphyry occurs *in situ* here. A general view of the geology at Kap Broer Ruys was not obtained owing to constant fog. Still olivine-trachybasalt were found in metamorphic shales with concretions of various acid rocks, i. a. decite.

At noon of August 19th MALMQVIST arrived at Ella Ø, and a few hours later he went in motorboat to Vega Sund, where various sections were measured. Near Scott Kelties Øer the beds seem to be Cretaceous shales with basalts. On Scott Kelties Øer typical flow structures were observed in the basalts. An Eskimo site was met with om Traill Ø south of Scott Kelties Øer. In the morning of August 25th MALMQVIST arrived at Ella Ø.