

REPORT ON THE TRAVELS AND WORK OF G. SÄVE SÖDERBERGH IN EAST GREENLAND IN THE YEARS 1931—36

As reports on the stratigraphical results of nearly all the journeys have already been published, in which the journeys and the travelling conditions, also, are briefly described, the present report will appear as a summary of the journeys.

The Summer of 1931.

1) July 30th—Aug. 4th ($5\frac{1}{2}$ days).—In company with A. NOE-NYGAARD, SÄVE-SÖDERBERGH made stratigraphical investigations and geological mapping in the northeastern corner of Clavering Ø (Djævlekløften and Dolomitdal). Assistant was DAN LAURSEN. Fossils were collected in the Permian (“Upper Caledonian” brachiopod limestones, which here appear as a sandy and conglomeratic facies with brachiopods, and dolomites with Zechstein fossils) and Cretaceous (Albian). The fossils were provisionally determined by H. FREBOLD and G. SÄVE-SÖDERBERGH. All the results are published in Medd. om Grønl. Bd. 94 Nr. 7 (1932). The party had its camp in Djævlekløften July 30th—Aug. 2nd, in Dolomitdal Aug. 3th—4th.

2) Aug. 5th—7th ($2\frac{1}{2}$ days).—Stratigraphical investigations, in company with D. MALMQVIST and E. NIELSEN, in the Brinkley Bjerg area on the south coast of Clavering Ø. Assistants: D. LAURSEN and H. LETH PEDERSEN. — Collecting of fossils in the Permian (*Posidonomya* shales and *Martinia* limestone, i. a. the first finding of *Medlicottia* (*Eumedlicottia*)) and the Trias. The stratigraphical results were published by L. KOCH (Medd. om Grønl. Bd. 83 Nr. 2, 1931, pp. 54—60). In addition the fossils have been treated by H. FREBOLD (Medd. om Grønl. Bd. 84 Nr. 4, 1932) and A. K. MILLER and W. M. FURNISCH (Medd. om Grønl. Bd. 112 Nr. 5, 1940).

3) Aug. 24th and 26th—28th.—Investigation of the Upper Devonian in the eastern part of Ymers Ø. The stratigraphical results

were published by G. SÄVE-SÖDERBERGH (Medd. om Grøn. Bd. 94 Nr. 4, 1932).

a) Aug. 9th—17th and 20th—22nd (11½ days).—Collecting of fossils and stratigraphical reconnaissances on the north side of Celsius Bjerg. Assistants: E. NIELSEN, D. LAURSEN, and H. LETH PEDERSEN. On Aug. 22nd L. KOCH took part in the collecting work. The camp, which was a permanent tent camp, was equipped with a Canadian cano and a small jolly boat in a poor condition, both only suitable for transports very near the shore, but they were nevertheless used for a rather risky voyage across Duséns Fjord. The largest and best vertebrate material secured this year was collected on the so-called East Plateau, i. a. the first Stegocephalian skull was found here on Aug. 12th. The party collected fossils on the East Plateau during five days, and used three and a half days for a revision of KULLING's locality in 1929 at Kulisserne. Of the fossils from 1931, the Stegocephalians have been treated by G. SÄVE-SÖDERBERGH (Medd. om Grøn. Bd. 84 Nr. 7, 1932). Camp at the foot of Celsius Bjerg Aug. 9th—17th and 20th—24th.

b) Aug. 18th—19th and in part 23rd—24th (altogether 2½ days).—Collecting of fossils (especially near ORVIN's locality) and stratigraphical investigations at Kap Graah. Assistants: E. NIELSEN, D. LAURSEN, and H. LETH PEDERSEN. In addition L. KOCH, D. LAURSEN, and LETH PEDERSEN collected fossils here on the whole of Aug. 23rd. So far only part of the material has been published, viz. by E. STENSIÖ (Medd. om Grøn. Bd. 97 Nr. 1, 1934).

c) Aug. 23rd (one day).—Short stratigraphical reconnaissance in Margrethedal west of Kap Franklin. Assistant: E. NIELSEN.

d) Aug. 26th—28th (2½ days).—Stratigraphical reconnaissance mainly in the southern part of Kongeborgen. Assistant: E. NIELSEN. D. MALMQVIST participated in the journey, but had a special task to perform.

The Summer of 1932.

July 27th—Aug. 25th (30 days, 1½ days of which were spent on the journeys and one day in packing collections).—Collecting of fossils and stratigraphical investigations in the Upper Devonian beds on Ymers Ø and Gauss Halvø. Assistants: E. JARVIK, G. LINDGREN, and T. SÄVE-SÖDERBERGH. The camp was equipped with a small open motorboat ("Horn"), which was well suited for voyages along the shore and in the smaller fjords (e. g. Duséns Fjord), but too small for voyages across Kejser Franz Josephs Fjord. After each trip it was necessary to haul it ashore, since it could not ride at anchor owing to the heavy swell in Kejser Franz Josephs Fjord.—The stratigraphical results have been published by G. SÄVE-SÖDERBERGH (Medd. om Grøn. Bd. 96, Nr. 1,

1933), one of the fossils by E. STENSIÖ (Medd. om Grønland. Bd. 97 Nr. 1, 1934), another by E. JARVIK (Zool. Bidrag fr. Uppsala, bd. 21, 1942, pp. 379—382, fig. 44).

a) July 27th—30th, Aug. 1st—3rd and 9th (8 days).—The work was continued on the north side of Celsius Bjerg with a revision of the earlier localities, thus the party was at work on the East Plateau for three days. Camp at the foot at Celsius Bjerg July 27th—Aug. 3rd and Aug. 8th—12th.

b) July 31st—Aug. 10th.—Reconnaissances in Duséns Fjord.

c) Collecting and stratigraphical investigations on the south side of Celsius Bjerg, where a complete section through the upper Devonian series of Celsius Bjerg was obtained for the first time. This was later used as a standard profile and basis for the palæontological and biostratigraphical division of the upper Devonian of East Greenland. On Aug. 8th a short visit was paid to Rudbecks Bjerg on Geographical Society Ø. Camped at the western part of the south side of Celsius Bjerg Aug. 4th—7th.

d) Aug. 12th—25th (13 days + 1 day for packing of fossils).—Collections and stratigraphical investigations were made around Wimans Bjerg and Stensiös Bjerg on the south coast of Gauss Halvø. Here the second richly fossiliferous area of the Upper Devonian was discovered, the *Remigolepis* series was found on Gauss Halvø, and a complete section in Stensiös Bjerg showed good agreement with the standard section in the south side of Celsius Bjerg. The localities richest in fossils were found on the south side of Stensiös Bjerg (collecting for eight days). A fossiliferous horizon *in situ* rich in *Remigolepis incisa-acuta* was found in Wimans Bjerg 350 m above the sea and was later found in Stensiös Bjerg 330 m above sea-level. Reconnaissances were made eastward to Nathorsts Bjerg and westward to the southeastern point of Smith Woodward's Bjerg. Camp Aug. 12th—26th on the shore at the foot of Wimans Bjerg.

The Summer of 1933.

1) June 27th—29th.—In company with H. ALDINGER, topographical mapping and geological reconnoitring on the south coast of Jameson Land in Scoresby Sund from Kap Stewart to c. 25 km west of this cape. The sediments here were Rhætic-Liassic to (?) Infravalanginian. Assistants: J. TROELSEN, G. WÄNGSJÖ, B. GRANSTRÖM, T. SÄVE-SÖDERBERGH, E. OHLSSON, two men in charge of the ponies, and for part of the period further E. MÖLLER and E. DRASTRUP. — The stratigraphical results have been published by H. ALDINGER (Medd. om Grønland. Bd. 99 Nr. 1, 1935), which paper contains a map prepared by G. SÄVE-

SÖDERBERGH. The fossils have in part been treated by L. F. SPATH (Medd. om Grøn. Bd. 99 Nr. 2, 1935).—The camps are indicated on Pl. 2 in ALDINGER's paper (Medd. om Grøn. Bd. 99 Nr. 1, 1933).

2) July 17th—24th.—Geological investigation and topographical mapping of the Namurian beds in Passagehøje (6 days) and a short visit to the west side of Kap Stosch (Rivers 1 and 2). Assistants: G. WÄNGSJÖ, E. OHLSSON, B. GRANSTRÖM, and T. SÄVE-SÖDERBERGH. — Topographical mapping by the aid of a small Hildebrand theodolite. On this map the sediments were inserted, which proved to belong to the Namurian, not to the Devonian, as previously assumed. Fairly good plant fossils of Namurian age were found in the lower division. The results have been published by G. SÄVE-SÖDERBERGH (Medd. om Grøn. Bd. 96 Nr. 2, 1934). Camp July 17th—24th on the shore of Loch Fyne between Circuselv and Røde Roseelv.

3) July 26th.—A short stay at Kap Stosch in company with EIGIL NIELSEN and others, later on a visit to Jackson Ø together with G. SEIDENFADEN. Collection of fossils and rock samples.

4) July 27th—Aug. 25th (30 days).—Collecting of fossils, stratigraphical investigations, and mapping in the Upper Devonian of Gauss Halvø. Assistants: G. WÄNGSJÖ, B. GRANSTRÖM, E. OHLSSON, T. SÄVE-SÖDERBERGH. — The camp was equipped with three ponies and the motorboat "Karen", which was somewhat larger than that of the previous year, but it was more troublesome to haul it ashore. As the weather was generally good, it was very serviceable. Large collections of fossils were made, comprising about 40 cases. The collecting work was continued in the richly fossiliferous localities within the area Nat-horsts Bjerg, Wimans Bjerg—Stensiös Bjerg, where the first representatives of a new fossil animal of the Dipnoi-like type were found. The third richly fossiliferous area was discovered this summer, as it turned out that the area around Paralleldal which had previously been mapped as continental Carboniferous was actually an Upper Devonian *Remigolepis* series extremely rich in fossils. Below this series the *Phyllolepis-Bothriolepis groenlandica* fauna was found *in situ*, and not far from this place the *Bothriolepis jarviki* fauna *in situ*, which could thus be inserted in the stratigraphical profile.—The stratigraphical results have been published by G. SÄVE-SÖDERBERGH (Medd. om Grøn. Bd. 96 Nr. 2, 1934), which paper likewise contains a brief account of the plans and progress of the journeys in the summer of 1933 (pp. 8—10). Most of the fossil material collected has not yet been worked up, but the *Phyllolepis* material has been described by E. STENSIÖ (Medd. om Grøn. Bd. 97 Nr. 1, 1934).

Camps: July 27th—Aug. 8th: On the shore near Koralkløft west of Margrethedal.

Aug. 8th—18th: On the shore at the foot of Wimans Bjerg.

Aug. 18th—19th: On the shore east of the delta outside Paralleldal.

Aug. 20th—21st: On the shore of Moskusoksefjord near the mouth of Vastidal. The horse party (WÄNGSJÖ and OHLSO) likewise had their camp here Aug. 5th—19th.

Aug. 21st—22nd and 25th—26th: On the shore of Kejser Franz Josephs Fjord west of the delta outside Paralleldal.

Aug. 22nd—25th: In Paralleldal.

The Summer of 1934.

1) July 30th—31st.—Investigations on Depotø and Wegeners Halvø.

a) July 30th (some hours in the morning).—Stratigraphic investigations and geological mapping of Depotø, published by G. SÄVE-SÖDERBERGH (Medd. om Grøn. Bd. 96 Nr. 5, 1937). Assistants: A. GANSSER, R. MASSON, E. JARVIK, G. WÄNGSJÖ, B. GRANSTRÖM, and S. ARNELL.

b) July 30th.—Stratigraphical reconnoitring on the north side of Quensels Bjerg. Stratigraphical results are found in the above-mentioned paper (Medd. om Grøn. Bd. 96 Nr. 1 pp. 19—22). Assistants: G. WÄNGSJÖ, B. GRANSTRÖM, S. ARNELL, and POULSEN.

c) July 31st (6 hours).—Stratigraphical reconnoitring near Vimmel-skaflet. The results are included in the above-mentioned paper (Medd. om Grøn. Bd. 96 Nr. 5, 1937, pp. 19—22). Osteolepids (cf. *Canningius groenlandicus*) were collected here. Assistants: E. JARVIK, G. WÄNGSJÖ, B. GRANSTRÖM, and S. ARNELL.

2) Geological investigations and collecting of fossils in the Upper Devonian around Moskusoksefjord and Kejser Franz Josephs Fjord.

A) The motorboat party.—Assistants: B. GRANSTRÖM, S. ARNELL. The party was equipped with the same motorboat as the previous year. It was very troublesome for the three men to haul the heavy boat ashore whenever they reached a new place, and owing to the bad weather the boat ran ashore on the north side of Ymers Ø on Aug. 19th, but all the equipment in the boat was saved. — Very little of the material collected has been described so far. Mention should be made of the paper by E. STENSIÖ (Medd. om Grøn. Bd. 97 Nr. 2, 1936).

a) Aug. 2nd.—Air reconnaissance from Moskusoksefjord across Gauss Halvø and northward to Passagehøje and Wordies Gl. for supplementing of the geological mapping.



Fig. 190. SÄVE-SÖDERBERGH'S motorboat in 1934.

b) Aug. 3rd—6th.—Excursions into Gastisdal, where various fossiliferous Devonian localities were found. The stratigraphical results have been provisionally dealt with by L. KOCH in "Geologie von Grönland" (1935, pp. 55 and 61). Some fossils have been described by E. STENSIÖ (Medd. om Grönl. Bd. 97 Nr. 2, 1936, and Bd. 97 Nr. 3, 1939).

c) Aug. 7th—8th.—Reconnoitring in Prospektal with collecting of Dinantian fossils.

d) Aug. 8th—9th.—Stratigraphical work at Kap Kolthoff.

e) Aug. 9th—11th.—Geological investigations on Bjørneø and Strindbergs Land.

f) Aug. 11th.—Stratigraphical investigations in Moskusokselandet north of the Norwegian trappers' station Hoelsbo.

g) Aug. 13th—14th.—Visit at the camp in Paralleldal, along the route collecting of fossils in the Crossopterygia ravine (cf. JOHANSSON, Medd. om Grönl. Bd. 96 Nr. 3, 1935, p. 14).

h) Aug. 15th.—Stratigraphical investigations near Bothriolepis Kløft.

i) Aug. 17th.—Stratigraphical investigations on the north coast of Ymers Ø east of Zoologdalen.

j) Aug. 18th—22nd.—Stratigraphical investigations on the north coast of Ymers Ø in the Devonian basal conglomerate.

k) Aug. 22nd—27th.—Camp west of the delta at the mouth of



Fig. 191. Landing of the equipment for a camp with ponies on the shore of Gauss Halvö.



Fig. 192. Ponies on the way to the interior of Gauss Halvö.



Fig. 193. Pony loaded with equipment, ready to start.

Zoologdalen on the north coast of Ymers Ø. Some few fossils have been described by E. STENSIÖ (Medd. om Grøn. Bd. 97 Nr. 2, 1936).

B) The horse party.—This party worked under the leadership of E. JARVIK, making collections of fossils and stratigraphical investigations in Paralleldal in the period Aug. 2nd—24th. Assistant was: G. WÄNGSJÖ. Three men were in charge of the ponies, viz. S. HANSSON, O. HARDER JENSEN, and R. NIELSEN.—The equipment included five Icelandic ponies, which were to carry provisions and equipment from the main camp on the shore near the mouth of Paralleldal to the camp farther up the valley and carry fossils from this camp down to the shore.—The stratigraphical results have been published by E. JARVIK (Medd. om Grøn. Bd. 96 Nr. 3, 1935). A small part of the fossil material has been described by E. STENSIÖ (Medd. om Grøn. Bd. 97 Nr. 2, 1936) and by E. JARVIK (Zool. Bidrag fr. Uppsala, Bd. 21, 1942).

The Summer of 1936.

1) July 26th—Aug. 25th.—Collecting of fossils and stratigraphical investigations in the Upper Devonian around Paralleldal and on Gauss Halvø. Assistants: B. WAERN, H. HALLIK, BYGUM-NIELSEN, OLSSON,

and the men in charge of the horses, R. NIELSEN and V. FREDERIKSEN. The equipment included three Icelandic ponies, which were to carry provisions from a permanent camp on the shore near the mouth of Paralleldal to the camp in the interior of the valley and carry fossils from this place down to the shore. The large collections of fossils included two specimens of Ichthyostegids, long-nosed, Dipnoi-like forms, Crossopterygians, and especially well preserved specimens of *Remigolepis*, thus a great many whole specimens. The greater part of the material collected has not yet been described, except a species of *Phyllolepis* described by E. STENSIÖ (Medd. om Grøn. Bd. 97 Nr. 3, 1939).

a) July 27th—30th.—Preliminary investigations in different parts of the region around Paralleldal.

b) July 30th—Aug. 12th and Aug. 17th.—Stratigraphical investigations and collecting of fossils on the south side of Sederholms Bjerg. Rich collections were found here, and a very complete profile through the *Remigolepis* series was measured. In addition the stratigraphical relation of that series to the *Phyllolepis* series was cleared up.

c) Aug. 13th—16th.—Investigations in Remigolepisryg and both sides of Kerstins Dal.

d) Aug. 18th—22nd.—Investigations of Lungefisk Valley and Smith Woodward's Bjerg. Rich collections of fossils and interesting stratigraphical observations were made.

e) Aug. 23rd—25th.—Investigation of the western part of the south side of Sederholms Bjerg, where the *Remigolepis* series occurs. Very detailed measurements of profiles were made here with interesting stratigraphical results. One of the profiles contained long-nosed Dipnoi-like forms.

2) Aug. 30th—Sept. 6th.—Stratigraphical investigations and collecting of fossils in the Middle Devonian, ?Upper Devonian, Dinantian, Namurian, and Permian on Canning Land and Wegeners Halvø. The stratigraphical results have been published by G. SÄVE-SÖDERBERGH (Medd. om Grøn. Bd. 86 Nr. 5, 1937, and Medd. om Grøn. Bd. 96 Nr. 6, 1938, pp. 5—7). The Middle Devonian fossils have been described by E. STENSIÖ and G. SÄVE-SÖDERBERGH (Medd. om Grøn. Bd. 96 Nr. 6, 1936). A presumably Upper Devonian Crossopterygian locality and a Dinantian fossil are figured by G. SÄVE-SÖDERBERGH (Medd. om Grøn. Bd. 96 Nr. 5, 1937, text-figs. 5 and 4 resp.).

Aug. 30th.—Investigations in the eastern part of Hesteskoen. *Heterosteus* and *Homosteus*, both new to Greenland, were found in sections a and b.

Aug. 31st.—Investigations were made in the western part of Hesteskoen. An osteolepid fauna (*Canningius*) was found in sections c and d.

Sept. 1st.—Investigations at Kollen (section e), where richly fossiliferous Permian beds were found, and in the valley to the west thereof, below the Permian, there occurred another conglomerate (?Namurian, section f) and Dinantian, which contained identifiable plant fossils. Then an investigation was made on the north side of Quensels Bjerg (section g), where a probably Upper Devonian *Holoptychius* rock from 1934 could be localised in the section. In addition a section (h) was measured in the north side of the valley north of Quensels Bjerg towards Lille Cirkusbjerg. Here the series with *Canningius* was again met with. A section (i) was obtained in the Kap Brown area, where the series with *Canningius* likewise occurred. Sections j and k were measured across the southern ridge towards Aalborg Fjord. In a series interbedded between the series with *Heterosteus* and that with *Canningius* a primitive *Asterolepis* (*A. Säve-Söderberghi*) was collected. *Homosteus* was found near the southern ridge.

Sept. 2nd—6th. Camp at the north side of Kollen.
