MEDDELELSER OM GRØNLAND
UDGIVNE AF
KOMMISSIONEN FOR VIDENSKABELIGE UNDERSØGELSER I GRØNLAND
Bd. 96 · Nr. 3

TREAARSEXPEDITIONEN TIL CHRISTIAN DEN X's LAND 1931-34
Under Ledelse af Lauge Koch

UPPER DEVONIAN FOSSILIFEROUS LOCALITIES IN PARALLEL VALLEY ON GAUSS PENINSULA, EAST GREENLAND

INVESTIGATED IN THE SUMMER OF 1934

BY

A. ERIK V. JOHANSSON

WITH 6 FIGURES IN THE TEXT AND 3 PLATES

KØBENHAVN
C. A. REITZELS FORLAG
BIANCO LUNOS BOGTRYKKERI A/S
1935

CONTENTS

	Page
Preface	5
I. Introduction	6
II. Description of the localities visited in 1934	8
1. Mt. Sederholm	8
2. Mt. Smith Woodward	17
3. Remigolepis Ridge	23
4. Glacier Valley	25
5. Circus Mountain	25
III. Summary and stratigraphical conclusions	28
1. The *Phyllolepis* Series	28
2. The *Remigolepis* Series	32
3. The Arthrodire Sandstone Series	35
4. The Upper Sandstone Complex	36
References	37

PREFACE

During the Danish Summer Expedition to East Greenland in 1933 under Dr. LAUGE KOCH's leadership several new localities rich in fossils were discovered by SÄVE-SÖDERBERGH in the central parts of Parallel Valley, situated in the western part of Gauss Peninsula. However, the time at SÄVE-SÖDERBERGH's disposal that year did not allow of a complete investigation of the whole area and during the summer expedition in 1934 a party of collectors therefore went to this area to continue the collecting of fossils.

I wish to express my sincere thanks to Dr. LAUGE KOCH for placing that party under my leadership and for the splendid outfit, which included i. a. five Icelandic horses.

I am greatly indebted to my friend, Dr. G. SÄVE-SÖDERBERGH, the leader of the paleontological work in the Devonian in the summer of 1934, for supervising the special outfit needed for our purpose.

I also wish to thank him for much good advice before and during the field work and for placing at my disposal the complete manuscript of his new and interesting paper (SÄVE-SÖDERBERGH 1934a), in which also our working-area was dealt with, and for the great interest he has taken in the preparation of the present paper.

I further wish to thank my assistants during the field-work: my personal friend, Mr. G. WÄNGSJÖ; Mr. S. HANSSON, who in an excellent manner managed the transports and took care of the horses; Mr. O. HARDER JENSEN; and Mr. R. NIELSEN.

The collections of fossils have been looked through and preliminarily determined by Professor E. STENSIÖ, to whom I am indebted for the part he has thus taken in the present paper and for a great amount of good advice concerning fossil collecting.

For assistance in the preparation of the map and other illustrations my thanks are due to Mr. S. EKBLOM and Miss I. EKBOM.

All the photographs reproduced in the text-figures and plates were taken by Mr. G. WÄNGSJÖ.

Throughout the present paper I have counted with a declination of 38° W.

I. INTRODUCTION

Our work in the central parts of Parallel Valley consisted chiefly in the collecting of fossils, but since, for the further study of the material collected, it is necessary to know the stratigraphical position of the different fossiliferous localities, a number of profiles were measured and also various other stratigraphical work was performed. The present paper intends to give some of the results of that work done within a limited area of the Upper Devonian of East Greenland.

The general stratigraphy of the Upper Devonian of East Greenland is now well known, chiefly through the papers by SÄVE-SÖDERBERGH (1932a, 1933, 1934a). A further publication by the same author on the results gained in the summer of 1934 will appear later. For more detailed information concerning the Devonian of East Greenland the reader is referred to the papers by SÄVE-SÖDERBERGH just mentioned, especially that published in 1934.

The area dealt with in the present paper, the central parts of Parallel Valley on Gauss Peninsula, has previously been investigated by SÄVE-SÖDERBERGH (1934a, pp. 30—38). The deposits occurring there were referred by SÄVE-SÖDERBERGH to the Upper Upper Devonian and were divided by him into the following series.

The Arthrodire Sandstone Series.

The *Remigolepis* Series.
- 3. Upper, reddish division.
- 2. Middle, dark-grey division.
- 1. Lowermost, red, marly division.

The *Phyllolepis* Series.

The *Phyllolepis* Series corresponds to the highest known Old Red deposits from other areas, for instance those of Elgin (Rosebrae beds), Clashbennie and Dura Den in Scotland, while the *Remigolepis* Series and the Arthrodire Sandstone Series represent the youngest strata of the Old Red hitherto known (SÄVE-SÖDERBERGH 1934a, pp. 49—50).

The investigations by SÄVE-SÖDERBERGH in 1933 showed that the central parts of Parallel Valley are very rich in fossils. During the short time at his disposal that year — only five days — a relatively large

material of fossils was secured, part of which has already been described (STENSIÖ 1934).

As the collecting of fossils takes much time, and as the time at disposal during an Arctic summer expedition is very limited, it is of great importance, in order to obtain as good results as possible, to recognise and carefully plan the work. In order to investigate as large areas as possible during the summer of 1934 the work in the Devonian that summer was carried out by two parties. A more extensive stratigraphical investigation was carried out by a motorboat-party under the leadership of SÄVE-SÖDERBERGH, while a second party under my leadership had the more special task to collect fossils in Parallel Valley.

The last-mentioned party consisted of Mr. G. WÄNGSJÖ, Mr. S. HANSSON, Mr. O. HARDER JENSEN, Mr. R. NIELSEN, and myself, and was equipped with five Icelandic horses. By means of the horses our outfit was transported from the shore of Franz Joseph Fjord to our camp a little to the west of the small lake in the central part of Parallel Valley, and the collections of fossils made in the surrounding mountains were conveyed to the shore. The time at our disposal (August 2 to August 24) was spent in the following way. The investigation of Mt. Sederholm took 13 days, that of Mt. Smith Woodward 3 days. One and a half days were spent in the investigation of the Remigolepis Ridge, while the investigation of Glacier Valley and the Circus Mtn. took one day each. Of the 3 days left, 2 days were spent in the removal of our camp outfit from the shore and back and one day at the shore in packing part of our collections in cases. During our stay in camp two of us, Mr. S. HANSSON and Mr. R. NIELSEN, were occupied all the time with the transport of the fossils down to the shore. Thus the collections were made by the rest of the party, Mr. G. WÄNGSJÖ, Mr. O. HARDER JENSEN, and myself.

Besides a specimen of an *Onychodus* and some plant fragments the material collected in Parallel Valley 1934 includes representatives of the groups *Placodermi*, *Crossopterygii*, and *Ichtyostegalia* (concerning the systematical position of these groups see for instance SÄVE-SÖDERBERGH 1934b, p. 17). No remains of forms belonging to the new group of *Choanata* (see SÄVE-SÖDERBERGH 1934a, p. 24; 1934b, p. 8) were found. Nor do our collections seem to contain any *Dipnoi*. The determinations of the fossils given in the present paper are only preliminary. However, a careful study of the collected material has already been commenced by STENSIÖ and SÄVE-SÖDERBERGH, the former of whom is working up the *Placodermi* and the latter the *Crossopterygii* and *Ichtyostegalia*. As has already turned out from their studies, several new species seem to be represented in the material.

II. DESCRIPTION OF THE LOCALITIES VISITED IN 1934

1. Mt. Sederholm.

(Pl. 1, figs. 1, 2; pl. 3).

The investigation of the central part of the S. slope of Mt.Sederholm took a great part of our time. As has already been mentioned, no less than 13 days were spent for this purpose, and during this time we examined the area between the Crossopterygian Ravine to the west and the area a little E. of Profile 1 to the east (pl. 3). Collections of fossils were made in this area, both from the *Phyllolepis* Series, and from the *Remigolepis* Series.

In the succeeding description of the localities on Mt. Sederholm we shall begin farthest east with Profile 1 (pl. 3), and the area east of it, and thence proceed westward. In connection with the description of the localities on Mt. Sederholm a zone rich in blocks yielding *Phyllolepis* and *Bothriolepis* will also be treated.

In the eastern part of Mt. Sederholm, more than 3 km E. of the Profile Ravine (SÄVE-SÖDERBERGH 1934a, p. 36), a profile (Profile 1, pl. 1, fig. 1; the map, pl. 3, and on the labels) was measured. Here the *Phyllolepis* Series is well exposed in a ravine, while the *Remigolepis* Series is more easily accessible in the ridge immediately east of the ravine.

The direction of the profile was N. 28° W.; the dip was measured to be about 5° S. 46° W.

At the base of the profile, at a height of 538 m above sea-level[1]), we encountered a greyish red sandstone. Upwards, above a transitional zone between 546 and 552 m made up of grey and red banded sandstones, the sandstone becomes more purely grey and usually shows a well developed cross-bedding. At 572 m the sandstone is replaced by a bank of a dark-green calcareous sandstone containing very badly preserved Crossopterygian remains. From 573 to 619 m there follows a more reddish division, built up in the lowermost part of red and grey banks of sandstone, in the higher parts mainly of red, coarse sandstones

[1]) The heights were measured by means of an aneroid (system Paulin).

or arkose. The top of the *Phyllolepis* Series is made up of a uniform, yellowish grey, cross-bedded sandstone with sparse, badly preserved plant fragments. The upper boundary proper of the *Phyllolepis* Series could not be ascertained, but may be at a terrace at 786 m.

Above this terrace the lowermost, red division of the *Remigolepis* Series can be traced up to 864 m, where another terrace occurs. The lowermost, red division of the *Remigolepis* Series is composed of dark-red and dark-brown, homogeneous, splitting marls.

The division of the *Remigolepis* Series following immediately above the lowermost, red one, just described — the middle, grey division — stated to occur from 864 m up to 1026 m in Profile 1, consists mainly of dark-grey or dark-brown, sometimes reddish, loose, stratified sandstones and marls alternating with harder banks. In the uppermost part, between 1003 and 1026 m, these banks are made up of thin layers (up to 1 dm in thickness) of a bluish limestone with a whitish hue of weathering, alternating with thin layers (up to 3 dm in thickness) of marl, which weathers into white dust. Between the harder banks made up in that way there is a marl, which also becomes whitish on weathering. Therefore the part between 1003 and 1026 m of the middle, grey division here under consideration, appears from a distance as a bright-coloured horizon. This bright-coloured horizon is very characteristic of the mountains surrounding the central part of Parallel Valley (pl. 1, figs. 1, 2; pl. 2; text-fig. 3). Since the strata making up the bright-coloured horizon weather very easily, a terrace is often formed at their outcrop.

Above the bright-coloured horizon just described the upper, reddish division of the *Remigolepis* Series is found. This division was traced up to the top of Mt. Sederholm (above Profile 1 situated at a height of 1388 m)[1]). It is built up in the same way as the underlying, grey one. Reddish brown and reddish rocks, however, become more frequent, so that the division appears reddish from a distance. Very interesting is the richness in fossils. Upwards of 1164 m almost all the hard, projecting banks are fossiliferous, fossiliferous horizons being recorded at 1164, 1238, 1248, 1270, 1284, 1374 and 1388 m. The fossils collected consist of fragments of *Remigolepis* and Crossopterygians.

As will be evident from the description given above, the sequence of strata in Profile 1 agrees in the main with that described by Säve-Söderbergh (1934a, pp. 36—37) from the profile in the ridge E. of the Profile Ravine. The conditions in the *Phyllolepis* Series, however, are somewhat different, a fossiliferous horizon being present at 572 m and above this a red division from 573 m to 619, not found at the Profile Ravine.

---

[1]) 1373 m on the map pl. 3 according to the measurement of the cartographers.

In this connection the conditions in the *Phyllolepis* Series E. of Profile 1 are of interest. In the next ravine east of Profile 1 (pl. 1, fig. 1; pl. 3) we found several fossiliferous horizons in this series. The two lowermost of these horizons, at 554 and 571 m, contained sparse Crossopterygian remains. At 598 m there is a bank of a greenish sandstone with fragmentary Crossopterygians, the same bank which occurs at 572 m in Profile 1. Above this fossiliferous bank a more reddish division is met with, exactly as in Profile 1. This division, stated to occur from 599 up to 664 m, is mainly made up as in Profile 1 of reddish sandstones and arkose. However, the deposits in the ravine under consideration are still coarser and also contain conglomerates. In the lowermost part of this red division we found fossils in a horizon at an altitude of 600 m. The fossils, collected in that horizon, or in the talus immediately below it, consist of cranial remains, various other bones, and scales of a large Crossopterygian of the type described as *Holoptychius nobilissimus* AG.

The fossiliferous horizon at 600 m could not be traced eastward, where, at the outcrop of the red division of the *Phyllolepis* Series, the slope of Mt. Sederholm is covered with talus masses originating from that division. These talus masses consist chiefly of large blocks, among which blocks of a reddish conglomerate (with pebbles up to 3 cm in diameter) are very abundant. A similar conglomerate is also mentioned by SÄVE-SÖDERBERGH (1934a, p. 38) from the easternmost part of Mt. Sederholm. Thus the red division of the *Phyllolepis* Series seems to grow rich in conglomerates towards the east. In Profile 1 this red division of the *Phyllolepis* Series has a thickness of about 41 m and in the next ravine to the E. of about 57 m. Thus its thickness increases eastward, as can also be seen from a distance (pl. 1, fig. 1; pl. 3). A large portion of the easternmost part of Mt. Sederholm is also made up of this division of the *Phyllolepis* Series (SÄVE-SÖDERBERGH 1934a, p. 38).

In the ridge E. of the Profile Ravine SÄVE-SÖDERBERGH (1934a, p. 37) in 1933 found three horizons rich in fossils in the upper, reddish division of the *Remigolepis* Series. However, the time at his disposal did not allow of an examination of the uppermost part of that division of the *Remigolepis* Series; in order, therefore, to get a complete profile through the *Remigolepis* Series in the central part of Mt. Sederholm we measured a profile (Profile 4 on pl. 1, fig. 2, and on pl. 3) in the ridge W. of the Profile Ravine. The direction of the profile was N. 15° W.

The upper boundary of the *Phyllolepis* Series in this profile was found to be at 766 m, where a dark-grey, slaty sandstone, rich in mica, occurs. The upper boundary of the lowermost, red division of the *Remigolepis* Series was stated to be at 848 m. A few metres below this upper boundary, at 842 m, fossils were found embedded in a greyish red,

homogeneous marl, splitting into rather large pieces with conchoidal fracture. This fossiliferous horizon yielded plates of *Remigolepis* with an ornamentation of the *kullingi*-type (STENSIÖ 1931, p. 188), scales of the *Holoptychius nobilissimus*-type and cranial remains of an Ichthyostegid (SÄVE-SÖDERBERGH 1932b). This fossiliferous horizon is of interest, as it seems to have a considerable horizontal extent in the central parts of Parallel Valley. Thus, at several other places in the western part of Mt. Sederholm, further in Mt. Smith Woodward, in the Remigolepis Ridge, and in the Circus Mtn. we found a corresponding vertebrate fauna embedded in a correspondingly developed rock and in a similar stratigraphical position, a few metres below the upper boundary of the lowermost, red division of the *Remigolepis* Series.

In the upper part of the middle, grey division of the *Remigolepis* Series in the same profile a terrace rising from 1014 to 1043 m occurs at the outcrop of the bright horizon mentioned in the description of Profile 1 (above p. 9). At 1043 m a sample was taken for the future examination of the sediments. Such samples, with indications of the N.-direction on the upper side, were also taken at several other points on the same level.

In the upper, reddish division of the *Remigolepis* Series, which in Profile 4 was traced up to the top of Mt. Sederholm above the Profile Ravine (pl. 1, fig. 2; pl. 3), we found several fossiliferous horizons. However, in the lowermost portion, as in the underlying middle, grey division, despite a careful search we did not succeed in finding any fossils. The lowermost fossiliferous horizon, at 1164 m, is very rich in fossils. The collection made in the horizon or in local talus below includes well preserved plates and carapaces of *Remigolepis* with ornamentation of the *acuta*- and *incisa*-types (STENSIÖ 1931, p. 190 and p. 183), scales of the *Holoptychius nobilissimus*-type, well preserved remains of Ichthyostegids including skulls connected with parts of the vertebrate column, parts of the shoulder girdle, and probably also certain parts of the limbs. Some badly preserved plant remains were found as well. Plates of *Remigolepis* and scales of *Holoptychius* are of frequent occurrence in the whole ridge, while all the Ichthyostegids were found in a single block. Detached scales of the *Holoptychius nobilissimus*-type were noticed in horizons at 1192 and 1276 m; at 1276 m embedded in a red marl, splitting into small pieces. The next fossiliferous horizon was encountered at 1312 m, where a piece of the snout of an Ichthyostegid was collected. At 1352 m there occur scales of a Rhizodontid, embedded in a dark-red sandstone; scales of the *Holoptychius nobilissimus*-type were found at 1381 m in a grey shale, and at 1459 m, only one metre below the summit, in a greyish green sandstone.

The ridge W. of Profile 4 was also closely investigated. The boundary

between the lowermost, red and the middle, grey divisions of the *Remigolepis* Series is here at 863 m, and the upper boundary of the middle, grey division at 1054 m. In the bank of the upper, reddish division, which is richly fossiliferous in the surrounding ridges (at 1174 m in Profile 4 and at 1208 m in the ridge E of the Narrow Ridge, cf. below) no fossils at all were found here. However, a few metres above, at 1215 m, we found a bank of a dark sandstone rich in mica, with abundant scales, various bones, and well preserved cranial remains of a Crossopterygian of the *Holoptychius nobilissimus*-type. However, these fossils were only found in a lens-shaped part of the strata in the western slope of the ridge. All this demonstrates the general inconstancy of the fossiliferous horizons in these continental deposits (cf. SÄVE-SÖDERBERGH 1934a, p. 23).

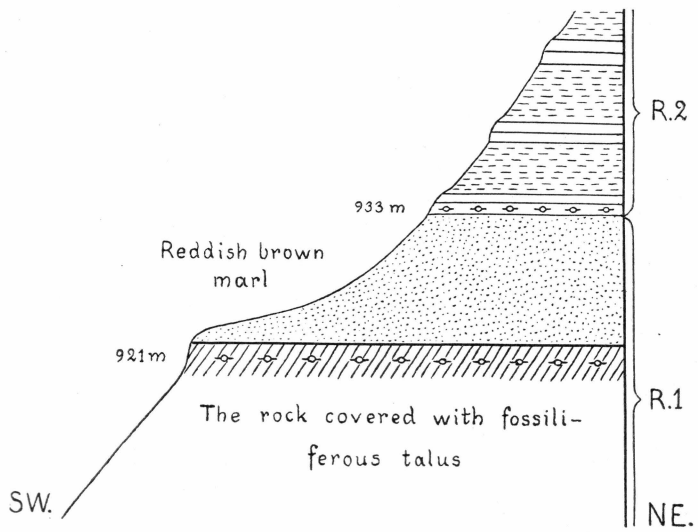
After measuring Profile 4 we went down Mt. Sederholm on the ridge east of the one called the Narrow Ridge ("Smala Ryggen" on the labels) by us (pl. 1, fig. 2; pl. 3). During the rapid descent we only succeeded in finding fossils in one horizon, at 1208 m, situated in the upper, reddish division of the *Remigolepis* Series. The fossils collected here, taken in the rock in situ or in the talus below, consist of remains of *Remigolepis* spp., mainly of the *acuta- incisa*-type, scales of the *Holoptychius nobilissimus*-type, and remains probably of a Rhizodontid. This fossiliferous horizon at 1208 m corresponds exactly to the fossiliferous horizon at 1174 m in Profile 4, as could be seen from our camp in Parallel Valley, whence the extent of the strata in the neighbouring mountains could be distinctly seen.

In the area from the Narrow Ridge westward as far as the Crossopterygian Ravine (pl. 1, fig. 2; pl. 3) the time at our disposal only allowed of an investigation of the upper part of the *Phyllolepis* Series and the lowermost, red division of the *Remigolepis* Series.

On the western slope of the Narrow Ridge the upper part of the lowermost, red division of the *Remigolepis* Series proved to be richly fossiliferous. The upper boundary of that division is at 899 m, where some grey banks occur. Below these banks there is a terrace covered with talus consisting of a reddish brown, easily splitting marl (cf. text-fig. 1). Below the gently sloping plane of the terrace some banks are exposed, the upper of which are made up of the reddish brown marl just mentioned, while the lower beds at 890 m include a fossiliferous, greyish red, homogenous marl, splitting into rather large pieces with a conchoidal fracture. This fossiliferous horizon at 890 m only yielded fragmentary Crossopterygian scales, but a narrow stripe below it is covered with talus, which turned out to be rich in plates of *Remigolepis* of the *kullingi*-type, scales of Holoptychiid and Rhizodontid Crossopter-

ygians, cranial remains and various other bones of Crossopterygians and Ichthyostegids. The remaining part of the ridge on a level with the lowermost, red division of the *Remigolepis* Series is covered with talus originating from the above-mentioned reddish brown marl, which yielded no fossils.

In the western slope of the next ridge to the W., the Broad Ridge ("Breda Ryggen" on the labels), we also found fossils in a correspondingly developed greyish red marl and in similar stratigraphical position, to those just described at 890 m in the Narrow Ridge. This fossiliferous horizon is here at a height of 921 m (text.-fig. 1), and yielded only fragmentary



Text-fig. 1. Diagrammatic sketch, showing the conditions at the transition from the lowermost, red (R 1) to the middle, grey division (R 2) of the *Remigolepis* Series in the SW. slope of the Broad Ridge. 921 m, the fossiliferous horizon at 921 m with *Remigolepis* of the *kullingi*-type; 933 m, horizon at 933 m with *Remigolepis* of the *kochi*-type.

Crossopterygian scales, but in the talus masses below we collected plates of *Remigolepis* of the *kullingi*-type, scales of the *Holoptychius nobilissimus*-type, and a fragment of an Ichthyostegid skull. Above this fossiliferous horizon there follows, precisely as in the Narrow Ridge, a terrace covered with a reddish brown, easily splitting marl, which was found in situ immediately above the terrace plane (text-fig. 1). At the transition from the lowermost, red division to the middle, grey division of the *Remigolepis* Series there occurs a bank of a dark-grey, stratified sandstone containing several almost complete specimens of *Remigolepis* of the *kochi*-type (Stensiö 1931, p. 185). Judging from the grey colour

the fossiliferous bank at 933 m must be referred to the middle, grey division of the *Remigolepis* Series. If that be true, this is the only locality where we have succeeded in finding fossils in that division.

In the ravine west of the Broad Ridge the upper part of the *Phyllolepis* Series is well exposed, and here we measured a profile beginning at the lowermost exposed rock at 516 m and following the beds up to the upper boundary of the lowermost, red division of the *Remigolepis* Series at 976 m. The direction of this profile (Profile 2 on pl. 1, fig. 2, and on pl. 3) is N. 4° W. A little to the west of the profile a dip of about 7° towards the S. 21° E. was noticed.

From 516 m up to 540 m in Profile 2 a cross-bedded, yellowish grey or reddish sandstone predominates. From 540 m up to 570 m the rock is not exposed. Above 570 m, up to the upper boundary of the *Phyllolepis* Series at 890 m, greyish, but also reddish or greenish, coarse sandstones occur. Of more remarkable kinds of rocks occurring here may be mentioned a dark, almost black shale at 591 m and a thin bank of a bituminous, mostly black — in the lowermost part red or green — sandstone at 693 m. From this sandstone indeterminable fragments of fossils were collected. The uppermost part of the *Phyllolepis* Series is built up of a grey, slaty sandstone, rich in mica, encountered at 890 m.

The lowermost, red division of the *Remigolepis* Series in the profile under consideration turned out to be very rich in fossils. Only a little to the east of the ravine in which the profile was measured we found, at 961 m, scales of the *Holoptychius nobilissimus*-type embedded in a greyish red marl. Immediately to the west of the rivulet in that ravine the slope is covered at about 965 m with fossiliferous blocks of a greyish red, conchoidally splitting marl. Here we found plates of *Remigolepis* of the *kullingi*-type, scales of Holoptychiid and Rhizodontid Crossopterygians, cranial remains and various bones of Crossopterygians and Ichthyostegids. The fauna, the rock, and the stratigraphical position of the fossiliferous horizon at about 965 m are thus identical with those of the fossiliferous horizons at 890 m in the Narrow Ridge and at 921 m in the Broad Ridge described above.

When visiting our camp in the central parts of Parallel Valley on the 13th of August 1934, SÄVE-SÖDERBERGH on his way up through the W. Parallel Valley found several Crossopterygian remains in a talus-delta below one of the ravines in the eastern part of Mt. Sederholm. Judging from the aspect of the fossiliferous rock the talus of that delta originated from the *Phyllolepis* Series. A few days afterwards we made a closer examination of this ravine, called the Crossopterygian Ravine by us (Crossopterygie-ravinen on the labels) (pl. 1, fig. 2; pl. 3). Further collections of fossils were made in the talus-delta and in the ravine above, in which fossiliferous horizons were noticed at 558, 582, 612, 617 and 641 m, all

in the *Phyllolepis* Series. The fossils collected in the Crossopterygian Ravine consist exclusively of Crossopterygians of the *Holoptychius nobilissimus*-type. At 558 and 582 m we found in the walls of the ravine detached scales embedded in a dark-grey, almost black, sandstone. Upwards the almost vertical rock walls of the ravine pass into a gently sloping terrace, and here large areas are almost entirely covered with fossils, mainly scales, but also various bones and cranial remains of Crossopterygians. Several specimens with scales in their natural position and with remains of fins and head were collected. Curiously enough these specimens have only the lower side of the head and trunk preserved. Three different fossiliferous horizons could be distinguished in the gentle slope of the above-mentioned terrace. In the lowermost of these horizons, at 612 m, the fossils are embedded in a dark sandstone, in the next one, at 617 m, in a dark-grey sandstone with a light hue of weathering, and in the uppermost one, at 641 m, in a light-grey sandstone also with a light hue of weathering.

About 150 m to the east of the Crossopterygian Ravine we found in talus at 543 m a block of a dark-grey sandstone with a light hue of weathering. This block, which must originate from the *Phyllolepis* Series, contained a specimen of a Crossopterygian with scales and the lower side of the head in their natural position. The finding of this block proves that at least one of the fossiliferous horizons of the *Phyllolepis* Series encountered in the Crossopterygian Ravine continues eastward. In the ravine of Profile 2, however, none of these horizons was encountered.

The fossiliferous horizons in the upper part of the *Phyllolepis* Series discussed above seem to continue to the west of the Crossopterygian Ravine, too, in hard, projecting banks in the westernmost part of Mt. Sederholm (pl. 1, fig. 2). The time at our disposal, however, did not allow of an examination of these banks. Corresponding banks also seem to be present in the opposite side of Parallel Valley in the western part of Mt. Smith Woodward.

After the above description of the fossiliferous localities in Mt. Sederholm proper, the talus masses, rich in *Phyllolepis* and *Bothriolepis*, covering a zone of the lower part of the S. slope of Mt. Sederholm, will now be treated. These fossiliferous talus masses were discovered in 1933 by Säve-Söderbergh (1934a, p. 35; pl. 3, fig. 1; pl. 9), who below the Profile Ravine at about 541 m collected from them a material of *Phyllolepis*, *Bothriolepis*, and scales of *Holoptychius*, a material which has already been partially described by Stensiö (1934).

In 1934 the fossiliferous talus-zone mentioned above was traced along a considerable stretch in the central parts of Mt. Sederholm (see pl. 3), and a large material of fossils was collected both E. and W. of the locality of 1933 below the Profile Ravine. Large collections were

made from 100 to 300 m E. of the Profile Ravine at a height of about 526 m (isolated fossiliferous blocks were found up to 547 m). Farther east we did not succeed in finding fossils in this horizon, though we searched the area to the ravine E. of Profile 1. W. of the Profile Ravine, on the other hand, we could trace the fossiliferous talus-zone all the way to the Crossopterygian Ravine, and from this part of it (text-fig. 2) also a large material was collected. A sparse additional material from the same talus-zone was collected by Säve-Söderbergh to the west of the Crossopterygian Ravine. The fossiliferous talus-horizon rises gently to



Text-fig. 2. The typical appearance of the talus masses yielding the rich fauna with *Phyllolepis* and *Bothriolepis* in the S. slope of Mt. Sederholm. In the background Mt. Sederholm with the Profile Ravine to the left.

the west, and at the Crossopterygian Ravine the fossils occurred up to 590 m. Nowhere in Mt. Sederholm did we succeed in finding the *Phyllolepis-Bothriolepis*-fauna in situ. However, the fossiliferous blocks occur in a zone 100 m at most in height (except, of course, at the rivulets issuing from Mt. Sederholm, where fossiliferous blocks have been transported right down to the river in Parallel Valley), and it is probable that the fossiliferous horizon is to be found at a level marked by the uppermost occurrence of the fossiliferous blocks, that is, at about 547 m E. of the Profile Ravine, at 541 m below the Profile Ravine, and at about 590 m in the neighbourhood of the Crossopterygian Ravine. The position of this level is marked -o-o- on pl. 1, fig. 2, and on the map, pl. 3. Very

possibly, however, one or several fossiliferous horizons may occur below the one presumed above (cf. below p. 25 the description of the fossiliferous horizons with *Phyllolepis-Bothriolepis* at about 422 m in Glacier Valley). The fossils are embedded in various sandstones, usually in a dark-grey, fine-grained sandstone with a yellowish hue of weathering, but also in dark-brown or reddish yellow sandstones. The fossils collected consist of some fairly complete specimens of *Phyllolepis söderberghi* STENSIÖ in addition to abundant plates of this and possibly other species, well preserved remains of *Bothriolepis* spp., a tooth of *Onychodus* sp., scales of the *Holoptychius nobilissimus*-type, and other Crossopterygian remains. Undeterminable plant fragments were also met with, though rarely.

2. Mt. Smith Woodward.

(Pl. 3; text-figs. 3, 4, 5).

Mt. Smith Woodward has not hitherto been closely investigated. In 1932 SÄVE-SÖDERBERGH (1933, p. 36) made a short excursion to the S. corner, but found no fossils. From the year 1933 the same author gives a profile through a part of the *Phyllolepis* Series in the westernmost part of the mountain (1934a, p. 29).

The northern slope of Mt. Smith Woodward — towards Parallel Valley — is divided by rivers into four parts (text-fig. 3; pl. 3; SÄVE-SÖDERBERGH 1934a, pl. 9). The westernmost of these parts consists of deposits belonging to the *Phyllolepis* Series, whereas the three easternmost parts above the *Phyllolepis* Series consist of deposits belonging to the *Remigolepis* Series; the two easternmost parts above these series also include deposits belonging to the Arthrodire Sandstone Series. In front of the third part from the east there is a fifth isolated part, attaining a height of 992 m and made up entirely of deposits of the *Phyllolepis* Series. It is in this part that the hard banks occur which correspond to the banks mentioned from the area east of the Crossopterygian Ravine in Mt. Sederholm (p. 15).

In 1934 time only allowed of an examination of the easternmost part of the northern slope of Mt. Smith Woodward, and its slope towards Kerstin Valley. Our description of Mt. Smith Woodward begins with the area of the easternmost part facing Parallel Valley (text-fig. 3).

From the river in the W. Parallel Valley the ground — made up of deposits belonging to the *Phyllolepis* Series — rises gently towards Mt. Smith Woodward. This gently sloping area was searched for fossils from Kerstin Valley westward to the next tributary to the river in Parallel Valley (text-fig. 3; pl. 3). In this area we hoped to find the rich fauna with *Phyllolepis* and *Bothriolepis* which, as described above pp. 15—17, was found in the corresponding parts of Mt. Sederholm, but no fossils at all were found (with the exception of some indeterminable

fragments, which were not collected). The deposits are mainly grey, coarse sandstones. To the south the gently sloping area just described ends in a marked steep.

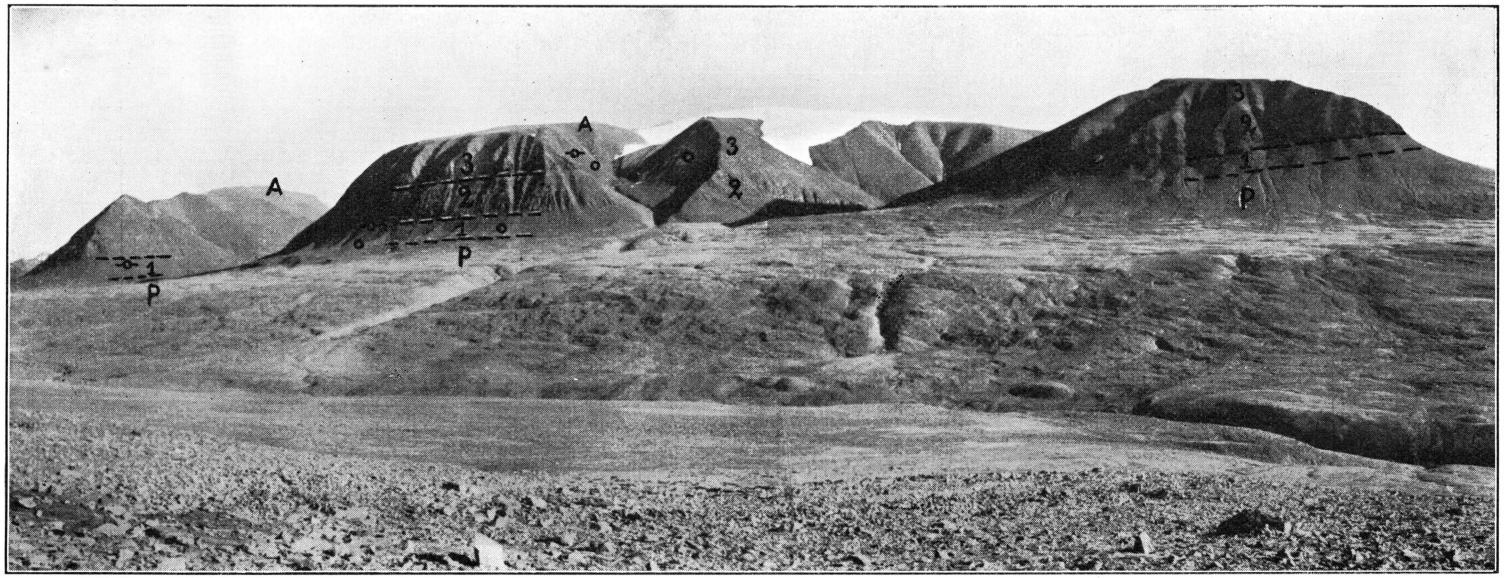
In the uppermost part of this steep, just below the NE. corner of the mountain, we encountered, at 657 m, a bank of a dark-grey, slaty sandstone, rich in mica, of the same type as that found in the uppermost part of the *Phyllolepis* Series in some places on Mt. Sederholm (cf. above pp. 10, 14). Above the marked steep wall a terrace extends along the northern side of the easternmost part of Mt. Smith Woodward. If the slaty sandstone just mentioned, as is the case in Mt. Sederholm, represents the transitional layer from the *Phyllolepis* Series to the *Remigolepis* Series, the terrace should be regarded as a down-slid part. Disturbances were observed at the SW. corner of the terrace, where a portion of the mountain, mainly including rocks belonging to the middle, grey and to the upper, reddish division of the *Remigolepis* Series, has slid down.

The terrace under consideration is covered with talus from the *Remigolepis* Series, and accordingly the exact position of the boundary between the *Phyllolepis* Series and the *Remigolepis* Series could not be established. Upwards, that is, towards the south, the terrace passes into the steep wall of the higher parts of Mt. Smith Woodward (text-fig. 3). In the talus-masses covering the terrace we collected a number of fossils: plates of *Remigolepis* (partly of the *acuta-incisa*-type), and scales and cranial remains of Crossopterygians. The boundary between the lowermost, red and the middle, grey division of the *Remigolepis* Series is at 757 m in the NE. corner of Mt. Smith Woodward. Somewhat below, at 754 m, there occurs a greyish red marl, yielding scales of the *Holoptychius nobilissimus*-type. The rock-type and the stratigraphical position of this fossiliferous horizon are the same as those of the corresponding fossiliferous horizons (at 842, 890, 921 and 965 m) in Mt. Sederholm (cf. pp. 31—32).

The middle, grey division of the *Remigolepis* Series in the parts of Mt. Smith Woodward investigated is of the same appearance as that in Mt. Sederholm, the characteristic bright-coloured strata in the upper part being well developed. In the NW. corner of the easternmost part of Mt. Smith Woodward the upper boundary of these bright-coloured strata, that is, the boundary between the middle, grey and the upper, reddish division of the *Remigolepis* Series, is at 889 m. The bright-coloured zone is made up of layers, at most 1 dm thick, of a bluish limestone alternating with layers, about 2 dm in thickness, of a loose marl, precisely as in Mt. Sederholm (cf. above p. 9).

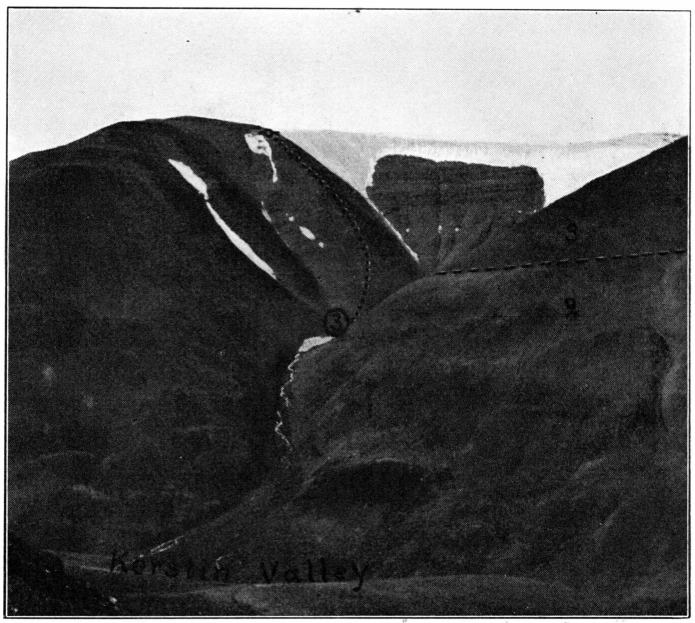
At the above-mentioned NW. corner of the easternmost part of Mt. Smith Woodward a dip of about 7° towards S. 74° E. was measured.

The upper, reddish division of the *Remigolepis* Series following



Text-fig. 3. View from the W. part of Mt. Sederholm towards the Remigolepis Ridge and the two easternmost parts of Mt. Smith Woodward. P, the *Phyllolepis* Series; 1, lowermost, red, 2, middle, grey, 3, upper, reddish division of the *Remigolepis* Series; A, the Arthrodire Sandstone Series; -o-, fossiliferous horizons; o, richly fossiliferous talus.

immediately upwards was studied in the E. slope of a ravine which to the west cuts off a triangular part of the easternmost part of Mt. Smith Woodward (text-fig. 3; pl. 3). In this slope the talus originating from the upper, reddish division is richly fossiliferous, and yielded more or less complete specimens of *Remigolepis* spp., scales and cranial remains of Crossopterygians (the scales of the *Holoptychius nobilissimus*-type), embedded in a dark-red sandstone. The fossiliferous talus originates for the most part from three fossiliferous horizons, each characterized by a species of *Remigolepis*. The lowermost of these horizons,



Text-fig. 4. View from the lower part of the NW. corner of the Remigolepis Ridge towards Mt. Smith Woodward, showing the course of Profile 3, 3 ------; 2, middle, grey; 3 upper, reddish division of the *Remigolepis* Series. The lowermost, red division of the *Remigolepis* Series is to be found in the canyon occurring below *y* in Kerstin Valley on the photo. -o-, fossiliferous horizon.

in the outer parts of the ravine situated at a height of 982 m, yielded plates of a medium-sized *Remigolepis*, the middle of these fossiliferous horizons, at 991 m, yielded plates of a small *Remigolepis*, and the uppermost horizon, at 995 m, abundant plates of a large one (with an ornamentation of the *acuta-incisa*-type) in addition to scales of the *Holoptychius nobilissimus*-type. At the bottom of the ravine the last-mentioned fossiliferous horizon is situated at 977 m. Here we collected plates of *Remigolepis*, and plant fragments. Above the fossiliferous horizon at 995—977 m no fossils at all were found in the talus. In ap-

pearance as well as in stratigraphical position — about 115 m from the base of the upper, reddish division of the *Remigolepis* Series — the fossiliferous horizon at 995—977 m resembles the fossiliferous horizon at 1174 m in the ridge W. of the Profile Ravine in Mt. Sederholm, which is also characterized by the occurrence of *Remigolepis* of the *acuta-incisa*-type, and of plant fragments.

In the opposite side of the ravine under consideration, that is, in the NW. slope of the above-mentioned triangular part of the easternmost part of Mt. Smith Woodward, we also collected fossils in talus consisting of a dark-red sandstone belonging to the upper, reddish division of the *Remigolepis* Series. Here plates of *Remigolepis* sp. and scales and cranial remains of Crossopterygians were found. Time did not allow of a search for the fossiliferous horizon from which the talus originates, but the fossiliferous blocks were not encountered above 989 m. Somewhat higher, however, there occur some banks made up of a red, easily splitting marl, at 1025 m containing sparse scales of the *Holoptychius nobilissimus*-type.

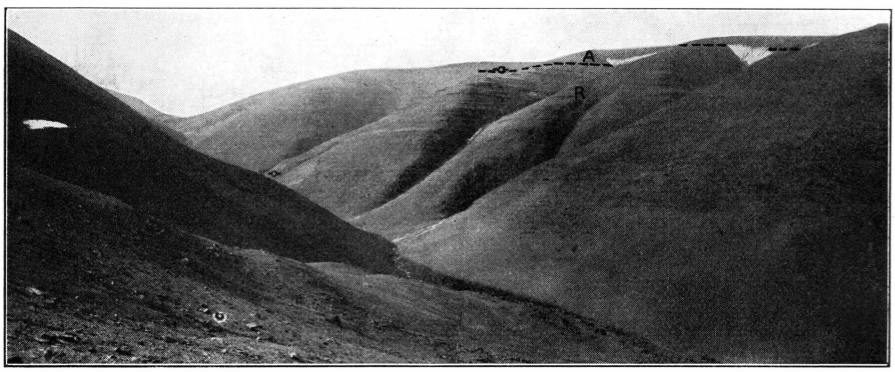
We made a very rapid investigation of the slope of the above-mentioned triangular part towards the river separating the two easternmost parts of Mt. Smith Woodward, but found no fossils in this much talus-covered slope.

The slope of Mt. Smith Woodward towards Kerstin Valley was investigated up to the innermost ravine shown on the map (pl. 3, see also text-fig. 5).

In the outer part of Kerstin Valley we followed the E. slope of the easternmost part of Mt. Smith Woodward up to the first great ravine (text-fig. 4; pl. 3). We searched for fossils in this talus-covered slope at a height corresponding to the middle, grey division of the *Remigolepis* Series. The talus on that slope mainly originates from the upper, reddish division of this series, and only yielded fragments of *Remigolepis* and Crossopterygians. In the part of Mt. Smith Woodward facing Kerstin Valley the boundaries between the divisions of the *Remigolepis* Series seem to be less distinct than in the part of this mountain facing Parallel Valley. The bright-coloured strata at the boundary between the middle, grey, and the upper, reddish, division of the *Remigolepis* Series, however, were traceable at least to the first large ravine (text-fig. 4) mentioned above.

Beginning in this ravine we measured a profile through the upper, reddish division of the *Remigolepis* Series and the lower part of the Arthrodire Sandstone Series to the top of Mt. Smith Woodward. The profile was measured in a small ridge (Profile 3 on the map, pl. 3, and on text-fig. 4) immediately to the east of the large glacier covering the largest part of the plateau on top of Mt. Smith Woodward. In the talus — which in the lower part of the ridge entirely covers the rock — we

found some cranial remains of Crossopterygians, embedded in a dark, fine-grained sandstone. In the upper part of the ridge there occur several banks mainly made up of greyish or greyish green, coarse sandstones. Fossils were encountered in three of these banks; at 1196 m and at 1202 m scales of the *Holoptychius nobilissimus*-type and other Crossopterygian remains were met with, while the uppermost horizon, at 1218 m, contained head-plates and other plates of *Remigolepis* sp. Thus this part of the deposits, though characterized by grey and green rock-types, must be referred to the upper, reddish division of the *Remigolepis* Series. In addition to the grey banks there occur red banks, noticed up to 1226 m. The ridge investigated passes into the plateau which



Text-fig. 5. View from the Remigolepis Ridge (in the foreground to the left) towards the slope of Mt. Smith Woodward in the inner part of Kerstin Valley. In the background to the left Mt. Stensiö.
A, the Arthrodire Sandstone Series; R, the *Remigolepis* Series (upper, reddish division); -o- fossiliferous horizons; o, large talus-blocks yielding inter alia a well preserved skull of an Ichthyostegid.

occupies the top of Mt. Smith Woodward, and it is exactly at the termination of the ridge that the above-mentioned uppermost, red bank occurs. Here, at 1226 m, the boundary between the *Remigolepis* Series and the Arthrodire Sandstone Series may be fixed.

On the gently sloping plateau on top of Mt. Smith Woodward greyish and greenish sandstones and marls belonging to the Arthrodire Sandstone Series occur. In local talus only a few metres above the uppermost red bank at 1226 m we found stem-fragments of *Knorria* sp., characteristic of the Arthrodire Sandstones Series. Somewhat higher on that plateau, at about 1294 m, we encountered banks of a medium-grained, grey sandstone, containing scales of the *Holoptychius nobilissimus*-type, various bones, and cranial remains of Crossopterygians.

We descended Mt. Smith Woodward by a ridge situated opposite the large glacier-tongue protruding from the large glacier on the Remi-

golepis Ridge (see pl. 3). At 1178 m on this ridge there is a greyish, fossiliferous sandstone-bank (text-fig. 5; pl. 3) with fragments of an Arthrodire, scales of the *Holoptychius nobilissimus*-type, cranial remains, and other bones of Crossopterygians. This fossiliferous horizon, at 1178 m, thus stated to be situated in the Arthrodire Sandstone Series, has a higher stratigraphical position than the above-mentioned horizon with *Remigolepis* sp. at 1218 m in Profile 3 farther to the N. The layers dip about 3° towards the S., and actually the fossiliferous horizon at 1218 m is situated about 18 m below the horizon at 1178 m. Thus in the ridge under consideration the boundary between the *Remigolepis* Series and the Arthrodire Sandstone Series can be drawn with certainty at about 1169 m.

Farther down the same ridge, only a few m above the river in Kerstin Valley, we found large, fossiliferous talus-blocks. The fossils collected are embedded in a dark-grey or dark-red, hard sandstone, and consist of scales of the *Holoptychius nobilissimus*-type and cranial remains of Crossopterygians. Above the place where these fossils were found, there occur some banks of a similar hard sandstone, which at 886 m contains scales of the *Holoptychius nobilissimus*-type. The fossils collected in the talus below this fossiliferous horizon probably originate from it.

The remaining part of the slope of Mt. Smith Woodward towards Kerstin Valley was investigated very rapidly. Plates of *Remigolepis* and scales of the *Holoptychius nobilissimus*-type were encountered in the talus, abundantly covering that slope, but no collections of fossils were made there.

3. Remigolepis Ridge.

The Remigolepis Ridge has previously been investigated by Säve-Söderbergh, who in 1933 (Säve-Söderbergh 1934a, p. 37) measured a profile in the NW. part of the mountain. Our work in 1934 mainly consisted in searching the slopes for fossils, mostly in their lowermost parts and chiefly in Kerstin Valley. The lowermost part of the NE. slope of the Remigolepis Ridge facing Parallel Valley was only investigated during a short excursion for an hour or two.

We entered Kerstin Valley east of the valley-river and went towards the NW. corner of the Remigolepis Ridge (pl. 3). Here, after a marked steep, a large terrace occurs, made up of deposits belonging to the *Phyllolepis* Series. Above that terrace the Remigolepis Ridge rises steeply. This terrace, mentioned by Säve-Söderbergh (1934a, p. 32), in our way rose from 571 m up to 672 m, when it passed into the steep slope of the Remigolepis Ridge proper. In its lowermost part the steep slope is covered with talus, mainly originating from the lowermost, red division of the *Remigolepis* Series. The very boundary between the *Phyllolepis* Series and the *Remigolepis* Series could not be ascertained

on account of talus. Up to 672 m, however, there follow grey sandstone-banks, characteristic of the *Phyllolepis* Series, and the said boundary must occur above this height, probably at about 700 m. That is, the boundary under consideration must be situated considerably above the boundary (572 m) indicated by Säve-Söderbergh (1934a, p. 37) in the area in question. In the lowermost part of the above-mentioned steep slope of the Remigolepis Ridge proper, just in the NW. corner of the mountain, banks of a greyish red marl are exposed. This marl belongs to the lowermost, red division of the *Remigolepis* Series, and contains at 754 m scales of the *Holoptychius nobilissimus*-type. About 100 m farther to the south this fossiliferens horizon is situated at 753 m, and yielded also plates of *Remigolepis* sp. and Crossopterygian bones. Red banks are exposed in the steep slope up to 763 m, and above a talus-covered part there occur, at 771 m, banks of a grey sandstone belonging to the middle, grey division of the *Remigolepis* Series. The very boundary between the lowermost, red and the middle, grey division of the *Remigolepis* Series must be situated between the two last-mentioned levels, viz. at about 767 m.

In the inner part of Kerstin Valley we searched for fossils in the lowermost, talus-covered parts of the above-mentioned, steep slope of the Remigolepis Ridge up to the glacier-tongue issuing from the Remigolepis Ridge and already mentioned in the description of Mt. Smith Woodward. Immediately to the south of the first large ravine from the mouth of the valley there occur among the talus large blocks of a dark-grey sandstone (text-fig. 5). In one of these large blocks we found a well preserved cranium of an Ichthyostegid, and in the same block scales of the *Holoptychius giganteus*-type. Other similar blocks yielded plates and carapaces of *Remigolepis* of the *acuta-incisa*-type. These fossiliferous blocks were found at about 845 m, a level corresponding to the middle, grey division of the *Remigolepis* Series, but they no doubt originate from the superposed upper, reddish division of this series. Farther up Kerstin Valley we found very few fossils. Mention should only be made of some well preserved cranial and other remains of Crossopterygians in addition to scales of the *Holoptychius nobilissimus*-type, found in talus right down at the river of Kerstin Valley near the third large tributary from the mouth of the valley.

In the NE. slope of the Remigolepis Ridge towards Parallel Valley the boundary between the *Phyllolepis* Series and the *Remigolepis* Series was found to be at 711 m. In the upper part of the lowermost, red division of the *Remigolepis* Series following immediately upward there occur, at about 764 m, in the slope under consideration, banks of a greyish red marl of the type found to be characteristic of the upper part of the lowermost, red division of the *Remigolepis* Series in other

areas (for instance in several localities in Mt. Sederholm). At 762 m — about 150 m to the SE. — one of these banks contained indeterminable Crossopterygian remains. The upper boundary of the lowermost, red division of the *Remigolepis* Series was stated to be at 774 m in the above-mentioned NE. slope of the Remigolepis Ridge.

4. Glacier Valley.

The well-exposed upper part of the *Phyllolepis* Series was investigated in the area between the Remigolepis Ridge and the Circus Mtn., that is, in the outer parts of Glacier Valley (pl. 3). In this area we hoped to find the rich fauna with *Phyllolepis* and *Bothriolepis*, described above from Mt. Sederholm (pp. 15—17). However, in the largest part of that area we found no fossils at all, but in the steep W. wall of the canyon cut by the Glacier Valley river, just at the river-bend below the Circus Mtn. (see the map, pl. 3), we found *Phyllolepis söderberghi* Stensiö, *Bothriolepis* sp., and scales of the *Holoptychius nobilissimus*-type. The fossils — embedded in a grey sandstone — were collected in a horizon at 422 m. This is the only locality in Parallel Valley, where the *Phyllolepis-Bothriolepis*-fauna has been found in situ. Below the fossiliferous horizon the sandstones rapidly grow coarser. In a light-grey, coarse sandstone underlying the fossiliferous horizon we found, at 420 m, Crossopterygian remains. Immediately below the fossiliferous horizon at 420 m a reddish conglomerate (pebbles up to 4 cm in diameter), about 20 m in thickness, was noticed. In the level area above and to the west of these fossiliferous horizons in the river canyon of Glacier Valley we found, in the talus, blocks yielding *Phyllolepis söderberghi* Stensiö, *Bothriolepis* sp., and Crossopterygian remains. The fauna and the fossiliferous rock — a sandstone with a yellowish hue of weathering — bear a striking resemblance to those previously described from the *Phyllolepis-Bothriolepis*-horizon on Mt. Sederholm. In the area above the canyon these fossiliferous blocks in the talus mainly occur below the level of the fossiliferous horizon at 422 m in the canyon, but were also found above that level up to 431 m, that is, 9 m. above the horizon in situ. This fact indicates that the *Phyllolepis-Bothriolepis*-fauna in Glacier Valley occurs in several adjacent horizons.

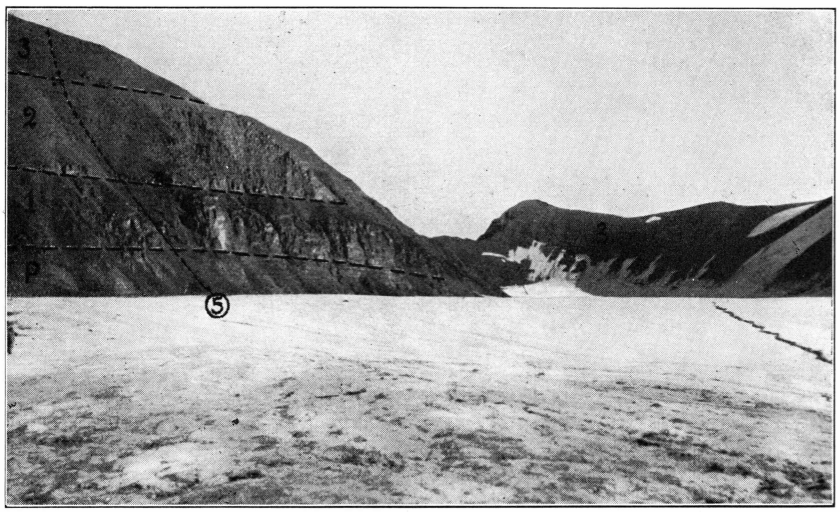
5. Circus Mountain.

(Text-fig. 6; pls. 2, 3).

The Circus Mtn. was originally called Mt. Karboncirkus by Backlund. The name was altered by Säve-Söderbergh (1934a, p. 32) to the Circus Mtn., because, like the other mountains surrounding the central parts of Parallel Valley, it is made up of Devonian deposits. In 1934 only one day was spent in the investigation of the Circus Mtn. (in 1933 it was not visited at all) and on this day we measured a profile

(Profile 5) in the central part of the mountain-complex (text-fig. 6; pl. 3). We ascended the mountain by way of the glacier occupying the westernmost large ice-circus. From a point in the middle part of the glacier we went up to the ridge separating this ice-circus from the next one to the NE., and measured the profile in the E. steep wall of the westernmost ice-circus. This wall is made up of deposits belonging to the uppermost part of the *Phyllolepis* Series and to the superposed *Remigolepis* Series (see text-fig. 6).

In Profile 5 the uppermost part of the *Phyllolepis* Series, and the lowermost, red division of the *Remigolepis* Series form an almost ver-



Text-fig. 6. View towards the E. from the westernmost ice-circus of the Circus Mtn. showing the course of Profile 5, 5 ----------; P, the *Phyllolepis* Series (uppermost, grey part); 1, lowermost, red; 2, middle, grey; 3, upper, reddish division of the *Remigolepis* Series.

tical wall (text-fig. 6), in which the rocks are well exposed. The boundary between the said two series is rather distinct. At 901 m a grey sandstone occurs, overlain by a greenish sandstone belonging to the *Phyllolepis* Series. At 902 m follows the lowermost, red division of the *Remigolepis* Series, in the lower part built up of a homogeneous, red marl, splitting into large pieces. At 954 m this marl contains plates of *Remigolepis* of the *kullingi*-type, and scales of the *Holoptychius nobilissimus*-type. Other fossiliferous horizons in this lowermost, red division of the *Remigolepis* Series occur at 966 and 970 m. The fossils in these horizons — at 970 m embedded in a brown, easily splitting marl — consist only of scales of the *Holoptychius nobilissimus*-type. The mentioned brown marl is overlain by a thin bank of a strongly red, homogeneous marl, at 970 m suddenly passing into a stratified, grey sandstone, forming the lowermost part of the middle, grey division of the *Remigolepis* Series. Thus the boundary

between the lowermost, red and the middle, grey division of the *Remigolepis* Series is very distinct.

The middle, grey division of the *Remigolepis* Series in Profile 5 is of a very similar appearance to that described from Mt. Sederholm (p. 9), the characteristic bright-coloured strata in the uppermost part being well developed (text-fig. 6). No fossils at all were found in this division. The upper boundary of the division was found to be at 1129 m.

The upper, reddish division of the *Remigolepis* Series in the profile under consideration was traced to the top of the ridge between the two westernmost circus-valleys in the Circus Mtn. at 1302 m. In this division also no fossils were found. The investigated part of the division is built up, at any rate in the upper parts, of very regularly alternating grey, red, and brown banks of sandstone. Thus for instance at 1204 m we collected samples of a grey, at 1205 m samples of a red, and at 1206 m samples of a brown sandstone, then grey banks follow again, etc.

In the NW. corner of the ridge, to the north of the large westernmost ice-circus of the Circus Mtn. mentioned above, (pls. 2, 3) the lower boundary of the middle, grey division of the *Remigolepis* Series was found to be at 916 m and the upper one at 1054 m, that is, below the boundaries stated above in the description of Profile 5 (at 974 m and 1129 m respectively). Probably this anomaly depends on local disturbances of the type described by SÄVE-SÖDERBERGH (1933, p. 15; text-fig. 1, p. 13) from the Western Circus Valley in Mt. Celsius. Such disturbances were also observed in the Circus Mtn., viz. in the inner parts of the W. steep wall of the westernmost circus valley, where the bright-coloured strata characteristic of the uppermost part of the middle, grey division of the *Remigolepis* Series to the north turned out to have been lowered about 50 m by faulting.

In the eastern parts of the Circus Mtn. facing Parallel Valley there occur, in the uppermost part of the *Phyllolepis* Series, a red portion (pls. 2, 3) separated from the overlying *Remigolepis* Series by a grey, not particularly thick, bed. This red portion was only observed from a distance, but it has the same position in relation to the *Remigolepis* Series as the red portion described in the upper part of the *Phyllolepis* Series in the eastern Mt. Sederholm (p. 10) and no doubt corresponds to it. As in Mt. Sederholm it seems to thin out and disappear to the west.

III. SUMMARY AND STRATIGRAPHICAL CONCLUSIONS

1. The Phyllolepis Series.

The *Phyllolepis* Series (SÄVE-SÖDERBERGH 1934a, pp. 35, 40—42) or the Lower Sandstone Complex, as the series was previously called by SÄVE-SÖDERBERGH (for instance 1933, p. 10), is on the whole rather poor in fossils. It was therefore very interesting that in 1933 SÄVE-SÖDERBERGH (1934a, p. 35) found a rich fauna in the upper part of this series in the S. slope of Mt. Sederholm in Parallel Valley.

As our work during the summer of 1934 had to be concentrated on the collecting of fossils, the examination of the *Phyllolepis* Series in the central part of Parallel Valley was limited to such places in which a reconnoitre showed the occurrence of fossils. These places are (pl. 3) a) the ravine E. of Profile 1 with four fossiliferous horizons at 554, 571, 598, and 600 m; b) the ravine at Profile 1 with one fossiliferous horizon at 572 m; c) the ravine at Profile 2 with one fossiliferous horizon at 693 m; d) the Crossopterygian Ravine with five fossiliferous horizons at 558, 582, 612, 617, and 641 m; and e) the richly fossiliferous talus-zone with *Phyllolepis-Bothriolepis*. All these localities are situated on Mt. Sederholm. Further a locality was discovered; f) in Glacier Valley with two fossiliferous horizons at 420, and 422 m, and fossiliferous talus above as well as below these horizons.

In most cases the fossils collected in the above-mentioned localities only consist of Crossopterygians. Judging from the scales collected, they belong to the type described as *Holoptychius nobilissimus* AG. Crossopterygians of this type are the only fossils found in situ in the fossiliferous horizons in Mt. Sederholm, viz. in localities a—d and in the fossiliferous horizon at 420 m in locality f.

In one locality only did we find the *Phyllolepis-Bothriolepis*-fauna in situ, viz. at 422 m in Glacier Valley. The position of this fossiliferous horizon at 422 m is at least 289 m (probably about 386 m) below the base of the *Remigolepis* Series, while the supposed position of the horizon giving rise to the talus-zone with *Phyllolepis-Bothriolepis* on the S. slope of Mt. Sederholm is at most 225 m (probably about 195 m) below the base of this series. The different position of these horizons in relation to the base of the *Remigolepis* Series does not of course necessarily signify a different stratigraphical position. The fossiliferous talus-zone on the S. slope of Mt. Sederholm bears a striking resemblance to the one occurring in the neighbourhood of the fossiliferous horizon at 422 m in Glacier Valley. The fossiliferous rocks in these talus-zones are very similar, a dark-grey sandstone with a yellowish hue of weathering, and

the faunas are of the same type, characterized by *Phyllolepis söderberghi* STENSIÖ, at least one large species of *Bothriolepis*, and scales of the *Holoptychius nobilissimus*-type. Besides these fossils the collections from Mt. Sederholm also include another species of *Phyllolepis* (mentioned as *Phyllolepis orvini* HEINTZ by SÄVE-SÖDERBERGH 1934a, p. 35), plates of a small species of *Bothriolepis*, a tooth of *Onychodus* sp., Crossopterygian remains, and plant fragments.

The stratigraphical position of the fossiliferous horizons in the *Phyllolepis* Series (as well as those in the *Remigolepis* Series and in the Arthrodire Sandstone Series) may be gathered from the table, pp. 30-32. This table is prepared on the model of a table published by SÄVE-SÖDERBERGH (1934a, p. 43), and includes all fossiliferous horizons[1]) in the central parts of Parallel Valley hitherto noticed. The values in the present table indicating the relations of the various fossiliferous horizons are, of course, very uncertain and give only the approximate stratigraphical position of the horizons (cf. SÄVE-SÖDERBERGH 1934a, p. 42). It is of course impossible on the basis of this table to correlate with exactness the various fossiliferous horizons. For that purpose the thicknesses of the sediments in these continental deposits are too varying. This is especially the case in the *Phyllolepis* Series, while the conditions in the *Remigolepis* Series in Parallel Valley seem to be more constant. The fossiliferous horizons are very seldom continuous, and usually they cannot be followed over a considerable distance. Thus for instance the richly fossiliferous banks in the Crossopterygian Ravine in Mt. Sederholm were not encountered in Profile 2 a few hundred metres to the E., despite the fact that the rocks at the height in question are well exposed in this profile.

A fact illustrating the lack of petrographical constancy in the *Phyllolepis* Series is the occurrence of a red portion in the upper part of this series in the eastern part of Mt. Sederholm, and of the Circus Mtn. This red portion (pl. 1, fig. 1; pls. 2, 3) has not been met with in the central parts of Parallel Valley and thus seems to thin out and disappear to the west. Characteristic of this red portion is the abundant occurrence of conglomerates.

---

[1]) Five of these, viz. the *Phyllolepis-Bothriolepis* horizon below the Profile Ravine in Mt. Sederholm, the horizons at 1105, 1118 and 1120 m in the ridge E. of the Profile Ravine, Mt. Sederholm and at 1292 m in the Remigolepis Ridge, were discovered by SÄVE-SÖDERBERGH in 1933. However, in the table published by SÄVE-SÖDERBERGH (1934a, p. 43) the calculations as to the distances from the base of the *Remigolepis* Series of the four last-mentioned horizons are not quite correct and have therefore been changed.

Table of the fossiliferous horizons of the Upper Devonian in the central parts of Parallel Valley.

(Page 30—32).

	Fossiliferous horizons in stratigraphical order:	Approximate distance from base of the *Remigolepis* Series	This distance corrected for comparison with other areas.
The Arthrodire Sandstone Series	Crossopterygians, 1294 m near the summit of Mt. Smith Woodward	717 m	895 m
	Arthrodire and Crossopterygians, 1178 m a little to the E. of the summit of Mt. Smith Woodward	630 -	808 -
The *Remigolepis* Series — Upper, Reddish Division	*Remigolepis* and Crossopterygians, 1218 m in Profile 3, Mt. Smith Woodward	616 -	789 -
	Remigolepis and Crossopterygians, 1292 m in the Remigolepis Ridge (cf. Säve-Söderbergh 1934a, p. 43)	714 -	778 -
	Crossopterygians, 1202 m in Profile 3, Mt. Smith Woodward	597 -	770 -
	Crossopterygians, 1196 m in Profile 3, Mt. Smith Woodward	591 -	762 -
	Crossopterygians, 1388 m in Profile 1, Mt. Sederholm	524 -	676 -
	Scales of the *Holoptychius nobilissimus*-type, 1459 m in Profile 4, Mt. Sederholm	611 -	666 -
	Crossopterygians, 1374 m in Profile 1, Mt. Sederholm	512 -	660 -
	Scales of the *Holoptychius nobilissimus*-type, 1381 m in Profile 4, Mt. Sederholm	541 -	590 -
	Scales of a Rhizodontid, 1352 m in Profile 4, Mt. Sederholm	516 -	562 -
	Crossopterygians, 1284 m in Profile 1, Mt. Sederholm	435 -	561 -
	Crossopterygians, 1270 m in Profile 1, Mt. Sederholm	421 -	542 -
	Ichthyostegid, 1312 m in Profile 4, Mt. Sederholm	480 -	523 -
	Crossopterygians, 1248 m in Profile 1, Mt. Sederholm	403 -	520 -
	Crossopterygians, 1238 m in Profile 1, Mt. Sederholm	393 -	507 -
	Scales of the *Holoptychius nobilissimus*-type, 1374 m in Profile 4, Mt. Sederholm	448 -	488 -
	Crossopterygians, 886 m in the W. slope of Mt. Smith Woodward	376 -	485 -
	Remigolepis (with ornamentation of the *acuta*- and *incisa*-types), scales of the *Holoptychius nobilissimus*-type, and plant fragments, 995 m in the W. ravine in the E. part of Mt. Smith Woodward	332 -	428 -
	Crossopterygians, 1164 m in Profile 1, Mt. Sederholm	329 -	424 -

		Fossiliferous horizons in stratigraphical order:	Approximate distance from base of the *Remigolepis* Series	This distance corrected for comparison with other areas
The *Remigolepis* Series	Upper, Reddish Division	*Remigolepis*, 991 m in the W. ravine in the E. part of Mt. Smith Woodward	328 m	423 m
		Holoptychiid Crossopterygians, 1215 m in the ridge W. of Profile 4, Mt. Sederholm	382 -	416 -
		Remigolepis, 982 m in the W. ravine in the E. part of Mt. Smith Woodward	318 -	412 -
		Scales of the *Holoptychius nobilissimus*-type, 1192 m in Profile 4, Mt. Sederholm	375 -	409 -
		Remigolepis (mostly with ornamentation of the *acuta*- and *incisa*-types), Crossopterygians, 1208 m in the ridge E. of the Narrow Ridge, Mt. Sederholm	359 -	391 -
		Remigolepis (with ornamentation of the *acuta*- and *incisa*-types, scales of the *Holoptychius nobilissimus*-type, Ichtyostegids, and plant fragments, 1174 m in Profile 4, Mt. Sederholm	359 -	391 -
		Remigolepis (with ornamentation of the *acuta*- and *incisa*-types), 1120 m in the ridge E. of the Profile Ravine, Mt. Sederholm (cf. SÄVE-SÖDERBERGH, 1934a, p. 43)	310 -	338 -
		Remigolepis (with ornamentation of the *acuta*- and *incisa*-types), 1118 m in the ridge E. of the Profile Ravine, Mt. Sederholm (cf. SÄVE-SÖDERBERGH, 1934a, p. 43)	308 -	335 -
		Remigolepis (with ornamentation of the *acuta*- and *incisa*-types), 1105 m in the ridge E. of the Profile Ravine, Mt. Sederholm (cf. SÄVE-SÖDERBERGH, 1934a, p. 43)	293 -	319 -
	Middle, Grey Division	*Remigolepis* (of the *kochi*-type), 933 m in the W. slope of the Broad Ridge, Mt. Sederholm	71 -	80 -
		Scales of the *Holoptychius nobilissimus*-type, 754 m in the NE. corner of Mt. Smith Woodward	67 -	79 -
	Lowermost, Red Division	Scales of the *Holoptychius nobilissimus*-type, 970 m in Profile 5, Circus Mtn.	63 -	78 -
		Scales of the *Holoptychius nobilissimus*-type, 966 m in Profile 5, Circus Mtn.	59 -	75 -
		Remigolepis (of the *kullingi*-type), Holoptychiid and Rhizodontid Crossopterygians, Ichtyostegids, 890 m in the W. slope of the Narrow Ridge, Mt. Sederholm	66 -	74 -
		Remigolepis (of the *kullingi*-type), scales of the *Holoptychius nobilissimus*-type, Ichtyostegids, 921 m in the W. slope of the Broad Ridge, Mt. Sederholm	66 -	74

	Fossiliferous horizons in stratigraphical order:	Approximate distance from base of the *Remigolepis* Series	This distance corrected for comparison with other areas
The *Remigolepis* Series, Lowermost, Red Division	*Remigolepis* (of the *kullingi*-type), Holoptychiid and Rhizodontid Crossopterygians, Ichtyostegids, 961—965 m in Profile 2, Mt. Sederholm	65 m	73 m
	Remigolepis (of the *kullingi*-type), scales of the *Holoptychius nobilissimus*-type, Ichtyostegids, 842 m in Profile 4, Mt. Sederholm	67 -	73 -
	Remigolepis, Crossopterygians, 753—764 m in Remigolepis Ridge	65 -	71 -
	Remigolepis (of the *kullingi*-type), scales of the *Holoptychius nobilissimus*-type, 954 m in Profile 5, Circus Mtn.	48 -	62 -
The *Phyllolepis* Series	Crossopterygians, 600 m in the ravine E. of Profile 1, Mt. Sederholm	184 -	184 -
	Crossopterygians, 598 m in the ravine E. of Profile 1, Mt. Sederholm	186 -	186 -
	Crossopterygians, 572 m in Profile 1, Mt. Sederholm	186 -	186 -
	Phyllolepis söderberghi STENSIÖ, *Phyllolepis* sp., *Bothriolepis* spp., *Onychodus* sp., Crossopterygians, plant fragments, up to 547—541—590 m on the S. slope of Mt. Sederholm (cf. SÄVE-SÖDERBERGH 1934a, p. 43)	195 -	195 -
	Crossopterygians, 571 m in the ravine E. of Profile 1, Mt. Sederholm	209 -	209 -
	Crossopterygians, 554 m in the ravine E. of Profile 1, Mt. Sederholm	226 -	226 -
	Crossopterygians, 641 m in the Crossopterygian Ravine	234 -	234 -
	Crossopterygians, 617 m in the Crossopterygian Ravine, Mt. Sederholm	254 -	254 -
	Crossopterygians, 612 m in the Crossopterygian Ravine, Mt. Sederholm	259 -	259 -
	Scales of the *Holoptychius nobilissimus*-type, 582 m in the Crossopterygian Ravine, Mt. Sederholm.	285 -	285 -
	Scales of the *Holoptychius nobilissimus*-type, 558 m in the Crossopterygian Ravine, Mt. Sederholm.	306 -	306 -
	Phyllolepis söderberghi STENSIÖ, *Bothriolepis* sp., Crossopterygians, 422 m in Glacier Valley	386 -	386 -
	Crossopterygians, 420 m in Glacier Valley	388 -	388 -

2. The Remigolepis Series.

Palaeontologically the *Remigolepis* Series (SÄVE-SÖDERBERGH 1933, p. 9; 1934a, pp. 42—44) is characterized by the abundant occurrence of the genus *Remigolepis*. Hitherto this genus has been known from

only one locality in East Greenland outside the *Remigolepis* Series (detached plate of *Remigolepis* sp. found in the *Phyllolepis* Series at Cape Graah, see SÄVE-SÖDERBERGH 1932a, p. 34).

In the mountains surrounding the central parts of Parallel Valley the *Remigolepis* Series may be divided into three divisions (SÄVE-SÖDERBERGH 1934a, p. 35): 1) a lowermost, red, 2) a middle, grey, and 3) an upper, reddish division. In 1934 these divisions were examined in the central parts of Parallel Valley. The three divisions are indicated in different colours in the accompanying map (pl. 3). The thickness of the different divisions and the total thickness of the *Remigolepis* Series will appear from the subjoined table p. 34.

1) The lowermost, red division. This division of the *Remigolepis* Series has been investigated a) in almost its whole extent from Profile 1 to the east, to and including the ridge west of the Broad Ridge to the west, Mt. Sederholm; b) in the NE. corner of Mt. Smith Woodward; c) in the SW. corner of the Remigolepis Ridge; d) in the NE. slope of the Remigolepis Ridge; and e) in the Circus Mtn. in Profile 5.

The lowermost, red division of the *Remigolepis* Series is well distinguished from the underlying *Phyllolepis* Series and the superposed middle, grey division of the *Remigolepis* Series. In the only place where the boundaries of the division under consideration are well exposed, viz. in Profile 5 in the Circus Mtn., they are very distinct. In contrast to the other divisions of the *Remigolepis* Series the division is made up of unstratified rocks, mainly of a greyish red, homogeneous marl, splitting into large pieces. In the upper part of the division this marl is usually replaced by a reddish brown, easily splitting marl.

The thickness of the lowermost, red division (see the table, p. 34) in the central part of Mt. Sederholm and in the Remigolepis Ridge usually reaches 72 to 73 m, but the division thins out both to the west and east. That is to say, the division is thickest at the bottom of the Mt. Stensiö Syncline (SÄVE-SÖDERBERGH 1934a, p. 52). From the bottom of this syncline the layers generally rise very regularly towards the sides. However, a flexure occurs in the westernmost part of Mt. Sederholm (pl. 3; SÄVE-SÖDERBERGH 1934a, text-fig. 13; pl. 3, figs. 1, 2).

The lowermost, red division of the *Remigolepis* Series is very rich in fossils. The fossils are generally well preserved, and very interesting from a palaeontological point of view. The fossils collected originate exclusively from the upper part of the division. The lower part is generally inaccessible on account of the talus-covering, and this probably explains why we did not succeed in finding fossils in this part. The fossils found in the upper part of the division consist of (see the table pp. 30—32) *Remigolepis* of the *kullingi*-type, scales of Holoptychiid and Rhizodontid Crossoptery-

Table, showing the approximate thicknesses in metres of the subdivisons of the Upper Devonian at some points in the central part of Parallel Valley.

Subdivisions	Mt. Sederholm				Mt. Smith Woodw.	Remigolepis Ridge	Circus Mtn.
	Profile 2	Ridge W. of Pr. 4	Profile 4	Profile 1	Profile 3		Profile 5
The Arthrodire Sandstone Series	0	0	0	0	77+	105+	0
The *Remigolepis* Series: Upper, reddish div.	..	..	367	315	about 400	about 490	161+
The *Remigolepis* Series: Middle, grey div.	..	166	173	141	about 150	about 175	144
The *Remigolepis* Series: Lowermost, red div.	70	..	72	68	about 70	73	67
The *Remigolepis* Series: Total	..	..	612	524	622	737	372+
The *Phyllolepis* Series	334+	..	216+	..	..	410+	..

gians, cranial and other remains of Crossopterygians and Ichthyostegids. This fauna, characterized by *Remigolepis* of the *kullingi*-type, is typical for the upper part of the lowermost, red division of the *Remigolepis* Series in the central parts of Parallel Valley.

2. The middle, grey division. This division of the *Remigolepis* Series, was investigated in 1934: a) in Profile 1, Mt. Sederholm; b) in Profile 4 and in the ridge W. of it, Mt. Sederholm; c) in the SW. corner of the easternmost part of Mt. Smith Woodward; d) in the outer parts of Kerstin Valley; e) in Profile 5, Circus Mtn.; f) the lowermost part of it also in the same localities as the lowermost, red division (cf. above p. 33).

The middle, grey division of the *Remigolepis* Series is made up of stratified, hard banks of grey, brownish, or sometimes more reddish sandstones and marls, with loose marls, weathering readily into a grey or greyish brown dust, intercalated between the hard projecting banks. These step-like projecting hard banks give the division a striped appearance (text-figs. 1, 3, 6; pls. 1, 2). Characteristic of the uppermost part are the bright-coloured strata about 25 m in thickness, the structure of which has already been treated (p. 9). The total thickness of the division under consideration (see the table above) is greatest (about 175 m) at the bottom of the Mt. Stensiö Syncline but thins out in the sides of the

syncline. As mentioned above (p. 33) this thinning out to the sides is also characteristic of the lowermost, red division.

No fossils have been found in the middle, grey division of the *Remigolepis* Series except at 933 m in the W. slope of the Broad Ridge in Mt. Sederholm. However, the fossils collected here — specimens of *Remigolepis* of the *kochi*-type — originate from the lowermost bank of the middle, grey division, which is closely connected with the richly fossiliferous uppermost part of the lowermost, red division of the *Remigolepis* Series. In fact this horizon may quite probably be equivalent to the uppermost fossiliferous horizon of the red division in Mt. Nathorst (372 m), as described by SÄVE-SÖDERBERGH (1934a, pp. 23—24).

3. The upper, reddish division. This division of the *Remigolepis* Series has been examined in 1934: a) in Profile 1, Mt. Sederholm; b) in Profile 4 and the ridge to the W. of it, Mt. Sederholm; c) in the ridge east of the Narrow Ridge, Mt. Sederholm; d) in the ravine in the W. part of the easternmost part of Mt. Smith Woodward; e) in the middle part of Kerstin Valley; and f) in Profile 5, Circus Mtn.

The upper, reddish division is on the whole made up of similar rocks as the underlying middle, grey division. Red or reddish rocks are, however, more frequent, and the whole division thus gets a reddish appearance. No exact values of the thickness of the division under consideration can be given, but the thickness may be estimated at about 400 m in Mt. Smith Woodward. In Mt. Sederholm and in the Circus Mtn. the uppermost part of the division is not represented.

The upper, reddish division of the *Remigolepis* Series, except in the lowermost part (about 100 m in thickness), is very rich in fossils. The fossiliferous horizons, sometimes occurring in almost all the hard, projecting banks, are, however, rarely continuous, and it is difficult to correlate the fossiliferous horizons from one ridge to another in one mountain. It is, of course, still more difficult to establish a correlation throughout a large area. The fossils collected in the upper, reddish division consist of remains of *Remigolepis* spp., Crossopterygians, Ichthyostegids, and plant fragments. In the lower part of the fossiliferous portion — with a stratigraphical position of about 400 m above the base of the *Remigolepis* Series — specimens of *Remigolepis* with ornamentation of the *acuta-incisa*-type seem to predominate (see the table, pp. 30—32).

3. The Arthrodire Sandstone Series.

The Arthrodire Sandstone Series (SÄVE-SÖDERBERGH 1933, pp. 9—10, 1934 a, pp. 44—45) in Parallel Valley has previously been investigated in the Remigolepis Ridge (SÄVE-SÖDERBERGH 1934 a, pp. 37—38).

In 1934 this series was only investigated in the top of Mt. Smith

Woodward. The rocks building up the series in that top resemble those described from the Remigolepis Ridge (Säve-Söderbergh 1934 a, p. 37).

In the earlier investigated localities the Arthrodire Sandstone Series has turned out to be very poor in fossils (cf. Säve-Söderbergh 1934 a, p. 44). This is also true of the localities in Mt. Smith Woodward. In this mountain, however, two fossiliferous horizons yielding Crossopterygian remains were noticed in the Arthrodire Sandstone Series. The lowermost of these horizons, situated only 8 m above the top of the *Remigolepis* Series (cf. the tables pp. 30—32, and p. 34), also contained fragments of an Arthrodire. In blocks on the top of Mt. Smith Woodward we found stem fragments of *Knorria* sp. These blocks with *Knorria* were encountered in a position which shows that the stratigraphical position of *Knorria* sp. must be only a few metres above the top of the *Remigolepis* Series.

4. The Upper Sandstone Complex.

The Upper Sandstone Complex is not present in the mountains surrounding the central parts of Parallel Valley. The nearest investigated occurrence of that complex is in the top of Mt. Stensiö (see Säve-Söderbergh 1934 a, p. 45).

REFERENCES

Only the works cited in the present paper are included. Complete references will be found in the works of SÄVE-SÖDERBERGH 1932a and 1934a, given below.

SÄVE-SÖDERBERGH, G. 1932 a. Notes on the Devonian stratigraphy of East Greenland. Medd. om Grønl., Bd. 94, Nr. 4, 1932.

— 1932 b. Preliminary note on Devonian Stegocephalians from East Greenland. Medd. om Grønl., Bd. 94, Nr. 7, 1932.

— 1933. Further contributions to the Devonian stratigraphy of East Greenland. I. Medd. om Grønl., Bd. 96, Nr. 1, 1933.

— 1934 a. Further contributions to the Devonian stratigraphy of East Greenland. II. Medd. om Grønl., Bd. 96, Nr. 2, 1934.

— 1934 b. Some points of view concerning the evolution of the Vertebrates and the classification of this group. Stockholm, K. Sv. Vet.-Akad., Ark. f. Zool., Bd. 26 A, Nr. 17, 1934.

STENSIÖ, E. 1931. Upper Devonian Vertebrates from East Greenland. Medd. om Grønland, Bd. 86, Nr. 1, 1931.

— 1934. On the Placodermi of the Upper Devonian of East Greenland. 1. Phyllolepida and Arthrodira. Medd. om Grønl., Bd. 97, Nr. 1, 1934.

Færdig fra Trykkeriet den 8. Juli 1935.

PLATES

Plate 1.

Fig. 1. View towards the eastern part of the southern slope of Mt. Sederholm.
Fig. 2. View towards the western part of the southern slope of Mt. Sederholm. In the foreground the river of the W. Parallel Valley.

P. r. (P. g.) uppermost, red (grey) part of the *Phyllolepis* Series (P.); 1, lowermost, red; 2, middle, grey; 3, upper, reddish division of the *Remigolepis* Series. 1 (2, 4) ..... the course of Profile 1 (2, 4); -o- fossiliferous horizon; o richly fossiliferous talus; -o-o- the horizon with *Phyllolepis* and *Bothriolepis*.

Fig. 1.

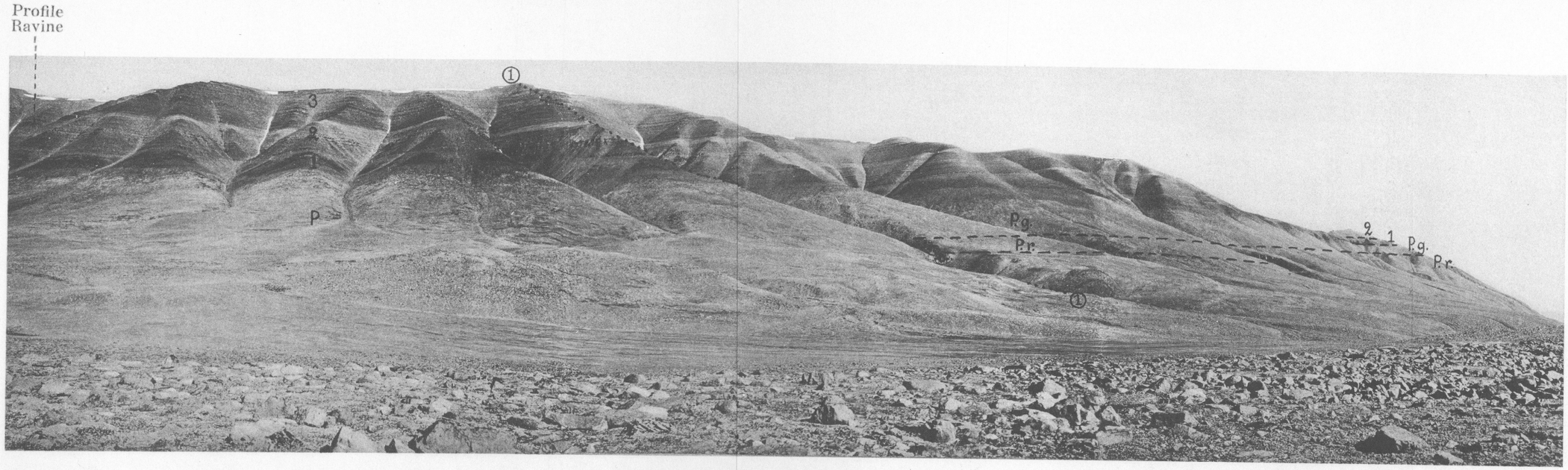

Profile
Ravine
①
3
2
1
P
Pg
Pr
2
1
Pg
Pr
①

Fig. 2.

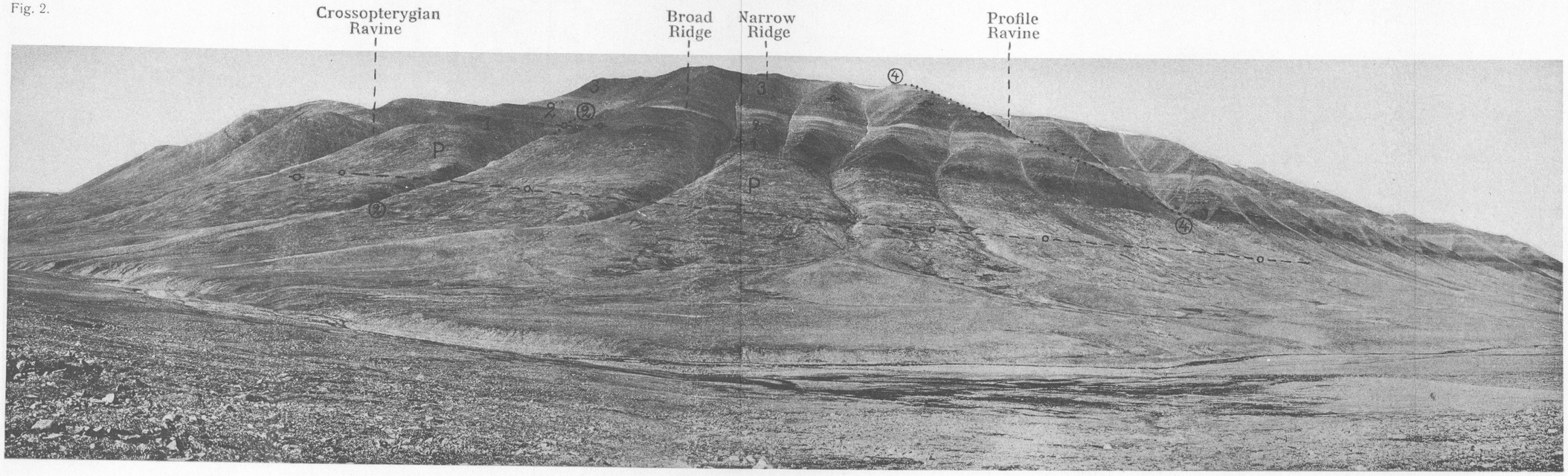

Crossopterygian
Ravine
Broad
Ridge
Narrow
Ridge
Profile
Ravine
④
3
2
②
1
P
②
3
P
④

Plate 2.

The Circus Mtn. seen from the area of Profile 1 in Mt. Sederholm. To the W. the Remigolepis Ridge and Glacier Valley. P, the *Phyllolepis* Series, Pr, uppermost red, Pg, uppermost, grey part of the *Phyllolepis* Series; 1, lowermost, red, 2, middle grey, 3, upper, reddish division of the *Remigolepis* Series.

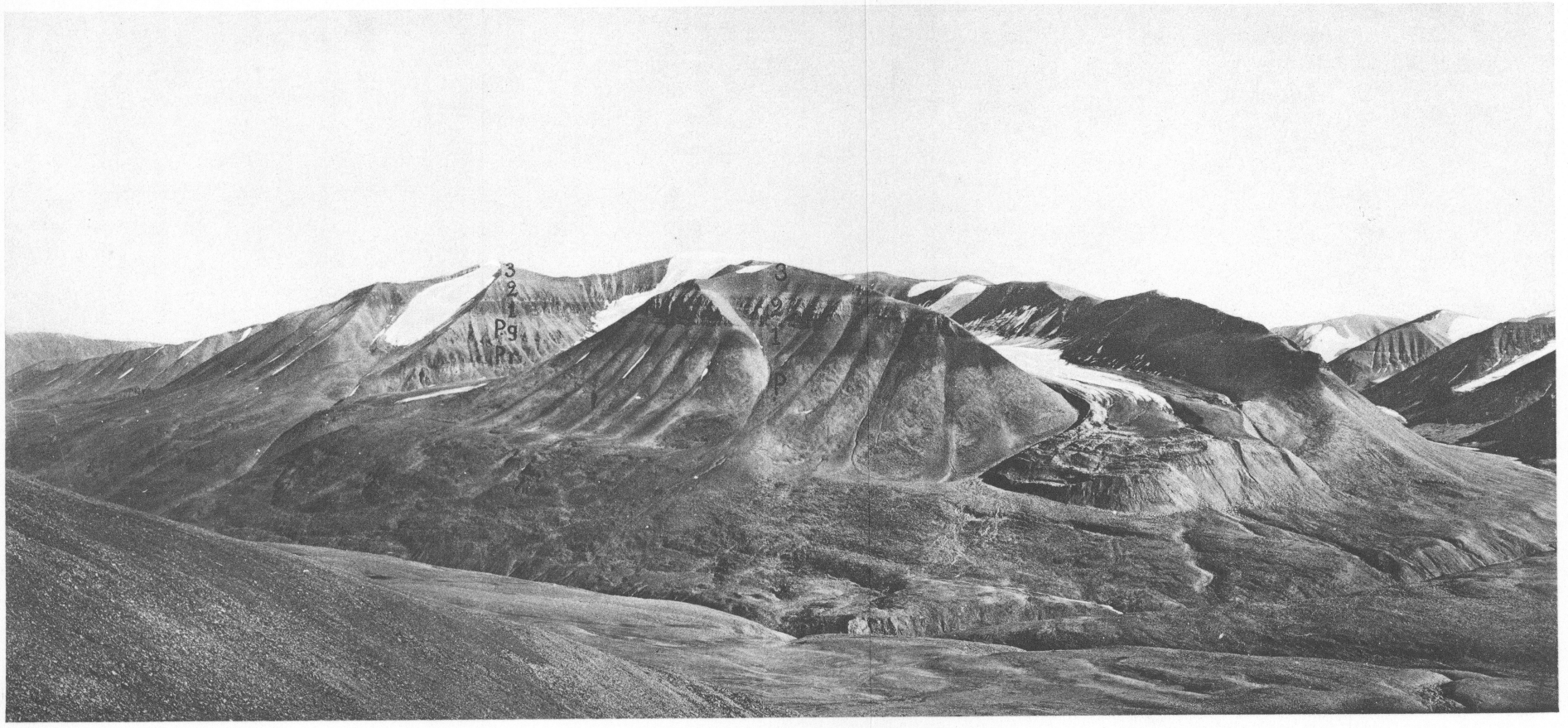
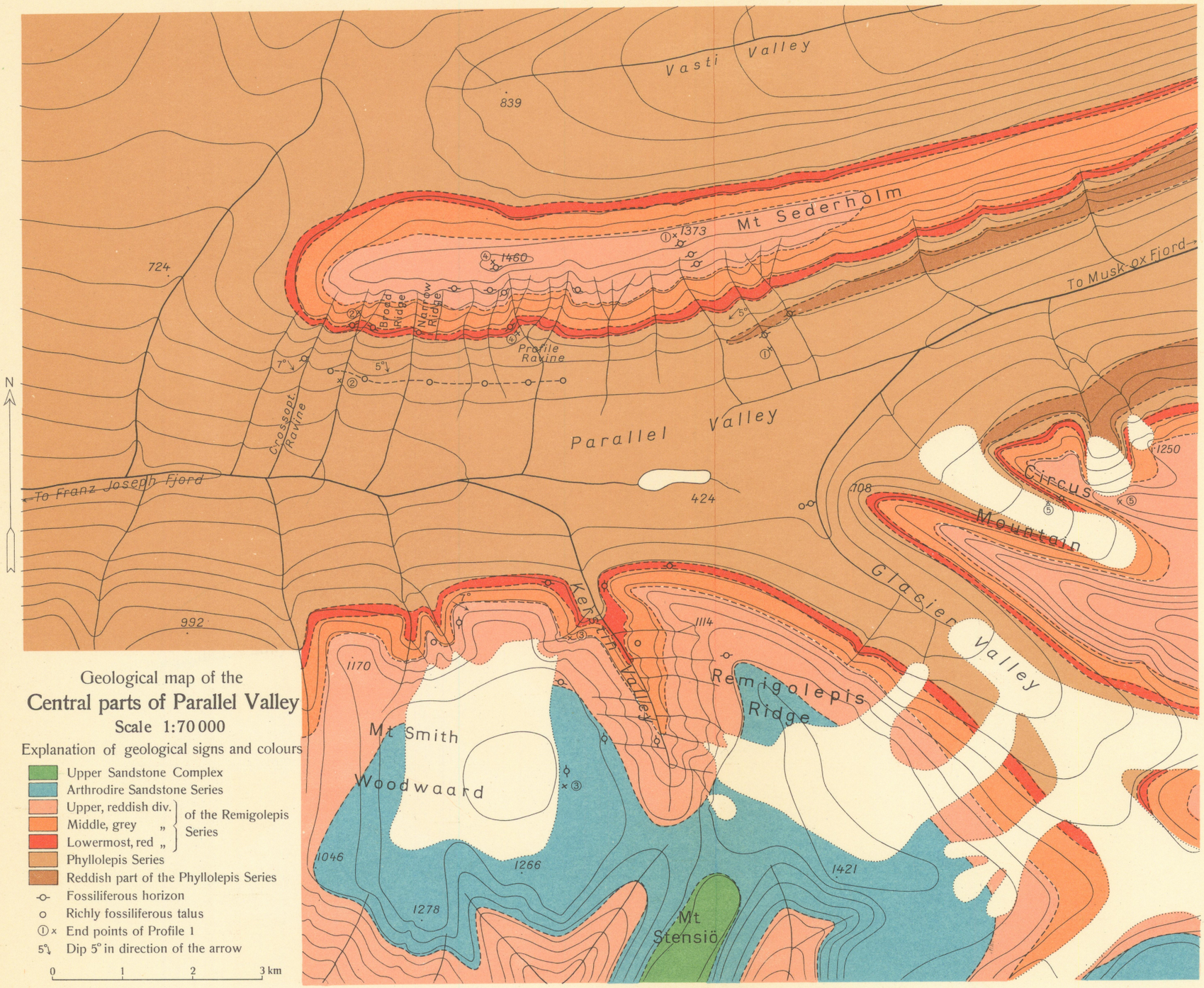

3
2
1
Pg
Pr
3
2
1
P

Plate 3.

Geological map of the central parts of Parallel Valley on Gauss Peninsula, East Greenland. Enlarged copy of part of a map of the central parts of Gauss Peninsula (SÄVE-SÖDERBERGH 1934 a, pl. 9), the areas closely investigated in the summer of 1934 more detailed. Geological and topographical features according to direct observations and measurements in the field and to photographs and sketches.



Geological map of the

Central parts of Parallel Valley

Scale 1:70 000

Explanation of geological signs and colours

- Upper Sandstone Complex
- Arthrodire Sandstone Series
- Upper, reddish div. } of the Remigolepis Series
- Middle, grey „ }
- Lowermost, red „ }
- Phyllolepis Series
- Reddish part of the Phyllolepis Series
- -o- Fossiliferous horizon
- o Richly fossiliferous talus
- ①× End points of Profile 1
- 5° Dip 5° in direction of the arrow