Glacial Erratics from the Sea Floor South-East of the Faeroe Islands and the Limit of Glaciation

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Introduction

There are only a few publications which deal with the glacial geology of the Faeroe Islands and none of these are of recent date. *Geikie* (1880), *Helland* (1880) and *Grossman and Lomas* (1895) agree, because of the directions of glacial striae and the complete lack of foreign erratics, that the Faeroe Islands have had a local ice cap. As no glacial striae, roche moutonnées or larger glaciated terrain forms have been observed above 500 meters height they suggest that the ice has only reached this height, i. e. the highest mountains protruded above the ice as nunataks. *Geikie* (1880) supposed that ice with this thickness would be able to reach the 200 fathoms isobath, where it should break up into icebergs.

The present paper deals with the limit of glaciation south-east of the Faeroe Islands and is based on a study of glacial erratics dredged from the sea floor. It is part of a current marine geological research programme initiated by the Faeroese Government in 1971 in cooperation with the Geological

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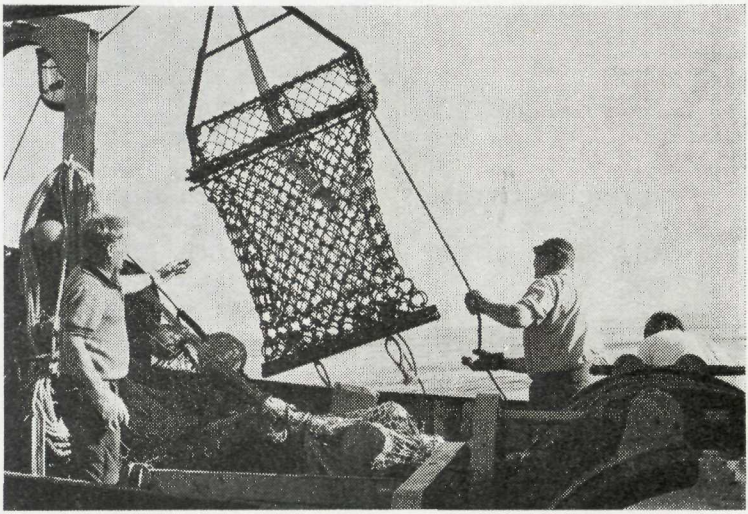


Fig. 1. *The Pecten dredge on board »J. C. Svabo«.*
1. mynd. *Skeljadreggið umborð á »J. C. Svabo«.*

Survey of Denmark (*Rasmussen* 1973, 1974). According to this programme the glaciation of the outer shelf is to be studied by dredging erratics from the sea floor along lines radiating away from the islands in all directions, and a special attempt should be made to define the limit of glaciation from the ratio between local and foreign erratics.

The research vessel »J. C. Svabo« (138 gross register tons) was placed at our disposal by the Fishery Research Institute in Tórshavn. »J. C. Svabo«, which is owned by the Faeroese Government, is equipped with Decca navigation system, radar and echo sounder (Simrad scientific sounder EK 12 A).

All dredge hauls except no. 87 were made by a Pecten dredge (fig. 1) with a front opening of 12 × 120 centimeters and an effective mesh width of 5 centimeters used by the Fishery Research Institute for dredging scallops. The length of the dredge hauls was generally 1 — 3 kilometers. On slopes the haul was done approximately parallel to the isobaths.

From station 63 and onward we used a home-made tube sampler with a diameter of 5 centimeters mounted below the front opening of the dredge (fig. 1) for picking up the finer material. These samples will not be described in the present paper.

Geological setting

The Faeroe Island are the erosional remnants of a basaltic lava plateau of Lower Tertiary age. The visible part of the lava pile has a total thickness of about 3000 meters and consists of aphyric, plagioclase-phyric and olivine-phyric tholeiitic lavas and intercalated thin tuffaceous beds (*Rasmussen and Noe-Nygaard* 1970). It is divided into a lower, middle and upper series separated by small angular unconformities. The lower unconformity is marked by a thin coal-bearing sequence, the upper one by sill intrusions. The lava pile is slightly deformed into two structural domes, one centered just north-west of the islands and trending in the direction east-north-east to west-south-west, the other centered just west of the southernmost island, Suðuroy, and trending in the direction north-north-west to south-south-east. The basaltic lavas probably rest on a continental crust 30 kilometers or more thick (*Bott et al.* 1974).

On the outer part of the broad shelf south-east of the islands (fig. 2) the basalts give way to a sedimentary basin marked by a gravity low (*Bott and Watts* 1971). The total thickness of the sediments is about two kilometers between Sandoy Bank and Suðuroy Bank according to a seismic reflection profile. The sediments are prograding towards the south-east and are probably younger than the Faeroe basaltic plateau (*Korsakov* 1974). The steep inner margin of the basin coincides with the innermost part of the trough between the two banks. It runs in roughly the direction north-north-east to south-south-west judging from an aeromagnetic map (*Avery et. al.* 1968). Towards the south-east the basin is separated by

a low threshold (*Korsakov* 1974) and an escarpment (*Talwani and Eldholm* 1972) from the much greater basin in the Faeroe-Shetland Channel.

The trough between the two banks has a sediment filling up to about 200 meters thick, which is probably of Quaternary age (*Korsakov* 1974).

Bathymetry

The shelf around the Faeroe Islands has a roughly triangular outline with one of the corners pointing southwards. The shelf and continental slope inside the 500 meters isobath measures 330 kilometers in an east-west direction and 270 kilometers in a north-south direction. The total area is close to 45,000 square kilometers which contrasts with the area of the islands of only 1,400 square kilometers.

The shelf attains its greatest width towards the south-east. The outer part of the shelf is here occupied by Sandoy Bank and Suðuroy Bank with minimum depths of about 140 meters (fig. 2). The banks are partly separated from the inner shelf by two troughs whose inner parts trend south-west or south-south-west. The troughs are separated by a topographical sill connecting the north-western corner of Suðuroy Bank with the inner shelf. The northern trough bends at this sill towards the south-east continuing as a transverse trough separating the two banks from each other. It has a maximum depth exceeding 350 meters between Sandoy Bank and the inner shelf and close to (perhaps exceeding) 350 meters between the banks. It shallows towards the outer end and probably does not reach the shelf edge. The southern trough has a maximum depth of about 300 meters and likewise shallows outwards while bending to the south-south-east.

East and south-east of the banks the shelf flattens out and a well defined shelf break occurs at about 230 meters depth according to a few echo profiles obtained between the dredge stations.

The continental slope south-east of the Faeroe Islands slopes very gently towards the bottom of the Faeroe-Shetland Channel at a depth of roughly 1200 meters. To the south-east of the northern trough the average inclination of the slope between 300 and 800 meters is about $2^1/_4°$, but it diminishes gradually in both directions along the slope to about $^3/_4°$ about 65 kilometers to the south-west and north-east (*Berthois* 1969, fig. 6). The continental slope is very regular in a longitudinal profile and no canyons have been observed.

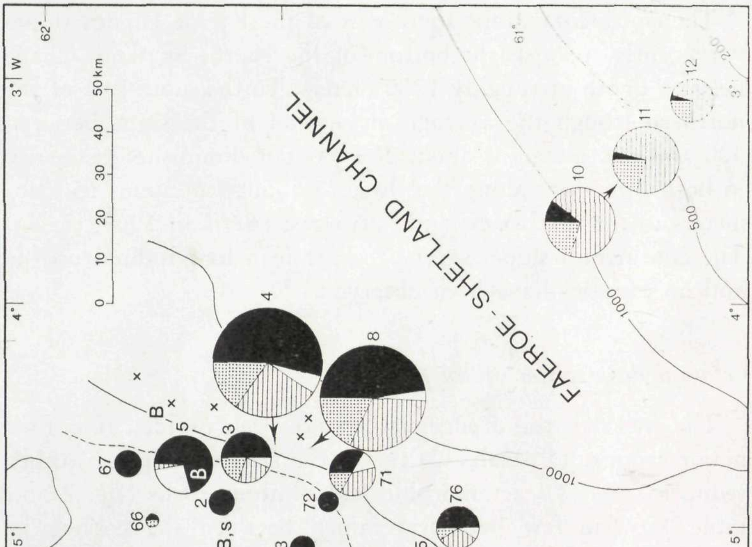
General description of the cobbles

The rocks in the dredge hauls have been divided into four major groups: 1) basalts, 2) tuff carbonate sediments, 3) other sediments and 4) metamorphic and plutonic rocks (fig. 2 and table 1). The few pebbles retained between the cobbles in some of the dredge hauls have been disregarded in the stone-counts.

The size of the cobbles is limited upwards by the height of the front opening of the dredge of only 12 centimeters. In all the dredge hauls the mean size of the cobbles, i. e. stones larger than 64 millimeters, only varies between 118 and 167 millimeters, while in the six deepest dredge hauls the mean size only varies between 118 and 129 millimeters.

The cobbles vary widely in roundness from very angular to well rounded (fig. 3). The majority, however, are subangular, subrounded or angular according to the classification of *Powers* (1953). This applies to all the dredge hauls. Gneisses and sandstones show a greater spread in roundness values than basalts and tuff carbonate sediments, but the mean roundness of the cobbles of these different rock types is nearly the same and falls in or close to the subangular class. Conspicuous glacial striae are seen on a small part of the cobbles irrespective of rock type.

Cobbles of calcareous rocks, i.e. limestones, tuff carbonate sediments and carbonate cemented sandstones, are usually covered with etch pits on their exposed sides.


THE FAEROE ISLANDS
SANDOY BANK
SUÐUROY BANK
FAEROE - SHETLAND CHANNEL
0 10 20 30 40 50 km
3° W
4°
5°
6°
7°
61°
62°
100
200
300
500
1000
1
2
3
4
5
6
8
10
11
12
63
64
65
66
67
71
72
73
75
76
77
80
84
87
B
B,s
S,M
B,s,m

At greater depths than about 500 meters all cobbles have an iron-manganese coating, less than 0.1 millimeter thick.

The cobbles are overgrown by various living organisms and their skeletal remnants. This epifauna consists largely of bryozoans and polychaetes, but silicispongiae and brachiopods (Crania Anomalia) are common too and sometimes dominate. The covering of epifauna diminishes with depth and is scanty in the deepest dredge hauls (fig. 3).

That part of the surface of the cobbles which protruded above the sea floor can be estimated by the surface weathering, epifauna, iron-manganese coating and etch pits. On average 50 to 60 percent of the total surface of the cobbles in the dredge hauls at greater depth than 500 meters protruded above the sea floor. At shallower depths the average exposure of the cobbles is more variable and it is more than 75 percent in

Fig. 2. *The distribution of rock types among cobbles dredged southeast of the Faeroe Islands.*
Legend: Black = basalt, white = tuff carbonate sediments, ruled = other sediments, stippled = metamorphic and plutonic rocks. The area of each sector in the pie diagrams is proportional to the number of cobbles dredged. The smallest circles correspond to 1 cobble, the largest one to 139 cobbles. Number of dredge station is shown beside the circles. Three circles are displaced from their proper position indicated by arrows. X = dredge hauls with no cobbles. Rock types dredged by *Berthois* (1969) are shown by letters. B = basalt, S or s = sediments, M or m = metamorphic rocks. Upper case letters denote high relative abundance, lower case letters denote rather low abundance. Depth contours are in meters.

2. mynd. *Sundurbýtingin av grótsløgum, sum fingin vóru í landsynning úr Føroyum.*
Teknlýsing: Svart = basalt, hvítt = tuff- karbonat- legugrýti, strikur = annað legugrýti, prikkar = umskapað grótsløg og djúpgrýti. Víddin av hvørjari deild í klingrumyndini er í lutfalli við tali á botngróti, sum fingið var upp. Minsti kringurin samsvarar við 1 stein, størsti kringurin við 139 steinar. Tølini vísa til støðirnar. X = hál har einki botngrót var fingið upp. B = basalt, S ella s = legugrýti, M ella m = umskapað grótsløg vísa til Bertois *(1969). Dýpdarstrikurnar vísa dýpið í m.*

dredge hauls 1, 67 and 80. Fine sand or mud sometimes sticks to the lower side of the cobbles, whereas boulder clay is very rarely seen.

Basalts

On average, plagioclase-phyric basalts constitute 41 percent, olivine-phyric basalts 9 percent and aphyric basalts 50 percent of the cobbles of basalt dredged south-east of the Faeroe Islands. The last figure includes near-aphyric basalts with less than about 1 percent phenocrysts of any mineral and microphyric basalts with no phenocrysts exceeding 1 millimeter in length. The proportions between the different types of basalts are fairly constant when the larger dredge hauls are compared. Most of the basalts have been derived from lava flows and only a few from dikes or sills judging from the grain size. Most of the basaltic cobbles are surrounded by a brown weathering crust which differs much in thickness but seldom exceeds 10 millimeters.

The porphyritic basalts are usually glomerophyric. The plagioclase-phyric basalts typically contain 5 to 15 percent plagioclase phenocrysts, 1 to 3 percent pseudomorphosed olivine phenocrysts, and sparse microphenocrysts of clinopyroxene. In 10 percent of the plagioclase-phyric basalts, the length of the largest plagioclase crystals exceeds 5 millimeters. The groundmass consists of plagioclase, clinopyroxene, iron-titanium oxides and variable amounts of completely altered residual glass. Altered olivine is usually present too, but does not exceed about 5 percent. The groundmass texture is intergranular or rarely subophitic. In basalts with less than 1 percent olivine the iron-titanium oxide grains tend to be euhedral or skeletal.

The olivine-phyric basalts contain between 1 and 30 percent phenocrysts of olivine. A third of the basalts also contains phenocrysts or microphenocrysts of plagioclase, whereas phenocrysts of pyroxene have not been observed. Fresh olivine is present in nearly half of the basalts. In a third of the basalts

some of the olivine phenocrysts are rod-shaped and up to 5 millimeters long. The groundmass contains at least about 5 percent olivine which is usually completely altered. The content of iron-titanium oxides is lower than in the plagioclase-phyric basalts, while zeolites are more common both in the groundmass replacing residual glass and in vesicles. The groundmass texture is intergranular or more rarely ophitic or subophitic.

Most of the strictly aphyric, near-aphyric and microphyric basalts contain less than about 5 percent olivine and correspond closely in mineralogy and texture to the plagioclase-phyric basalts, while the rest are more rich in olivine and similar to the olivine-phyric basalts.

This grouping of all the basalts according to the olivine content roughly corresponds to the two groups of basalts on the Faeroe Islands named quartz tholeiites and olivine tholeiites by *Noe-Nygaard* and *Rasmussen* (1968).

Tuff carbonate sediments

These sediments are brownish in various shades and rather soft. They vary widely in composition from a carbonate rock with a few grains of volcanic ash to a pure tuff. The carbonate is finely crystalline and brownish. The volcanic ash, which is strongly altered, varies in grain size from fine to coarse sand. In most samples the grain size is rather uniform and bedding is either very faint or absent indicating a derivation of these cobbles from ash layers at least 5 to 10 centimeters thick. A few carbonate sediments contain burrows.

One cobble shows a few millimeters thick ash layer grading upwards into a carbonate rock with a few, small ash grains and sharply bounded downwards by a similar carbonate rock. A few indeterminable microfossils have been found in the carbonate matrix in another sample. In these cases the carbonate is clearly of sedimentary origin. However, two other cobbles (from stations 65 and 87) look like concretions in

shape, and the carbonate in these samples probably has been secondary introduced.

The volcanic ash grains are compact or slightly vesicular. Their outline is somewhat irregular and in most sediments they show some evidence of corrosion by the carbonate matrix. Most of the ash grains consist of glass completely altered to clay minerals or palagonite or replaced by carbonate. Some ash grains, however, are microcrystalline and plagioclase and iron-titanium oxides can still be identified in them, which shows that the ash is basaltic. Larger crystals are usually sparsely distributed in the ashes. Most consist of plagioclase (An 67 according to a single measurement), while microphenocrysts of pyroxene and iron-titanium oxides are fairly common too. Pseudomorphosed olivine has been identified in a few cases. The pyroxene is usually completely replaced by calcite, but is brownish gray when fresh.

The phenocryst content in the ashes suggests that they are similar in chemistry to the olivine-free and olivine-poor tholeiites from the Faeroe Islands.

Other sediments

Slightly more than 90 percent of the cobbles in this group consists of various sandstones, while the rest consist of dark siliceous silstones, dark shales and limestones. One cobble consists of chert and chalk, and one of chert alone.

The sandstones are typically fine grained, light or medium gray and rich in quartz. A few are micaceous. Most of the quartz-rich sandstones are cemented by quartz, while a third partly or solely are cemented by carbonate. A quarter of all sandstones constitutes a distinct group of arkoses with a pale red or grayish red colour. Some of the arkoses are inhomogeneous in grain size, but most are fine grained and in hand specimens easily confused with microgranite.

Table 1. *Number of cobbles dredged south-east of the Faeroe Islands.*
1. talva. *Talið á botngróti fingið í landsynning úr Føroyum.*

Station	Depth in meters	Total number of cobbles	Basalt	Tuff carb. sedi-ments	Other sediments	Metamorphic & plut. rocks
1	229	6	5			1
2	234—238	7	7			
3	423	30	15	2	7	6
4	571—622	139	75	7	36	21
5	219—258	41	29	11	1	
6	201—210	2	2			
8	677—719	126	60	4	40	22
10	713—732	58	6		40	12
11	548	53	2		40	11
12	307	24	1		17	6
63	250	15	14		1	
64	246—248	1	1			
65	255	7	5	2		
66	ca. 220	2	1			1
67	230	8	8			
71	590—602	24	8	3	9	4
72	270—290	5	5			
73	250	7	7			
75	400	2	2			
76	590—600	22	11	2	7	2
77	590—610	16	5		7	4
80	172—180	3	3			
84	390—450	2			1	1
87	182—200	1		1		

Metamorphic and plutonic rocks

Three quarters of the cobbles in this group consist of various gneisses, mainly biotite gneisses. Amphibolites, mica schists and quartzites are more rare. The plutonic rocks constitute less than 10 percent of the cobbles and are mainly granites. No mafic plutonic rocks are found.

The distribution of rock types

Cobbles of basalts greatly predominate on the Faeroe shelf (fig. 2 and table 1). On the upper part of the continental slope south-east of the Faeroe Islands the proportion of basaltic cobbles suddenly decreases to roughly 50 percent at 400 to 700 meters depth (stations 3, 4, 8, 71, 76 and 77), while on the opposite side of the Faeroe-Shetland Channel at 300 to 700 meters depth (stations 10, 11 and 12) between 4 and 10 percent of the cobbles are still basaltic.

Tuff carbonate sediments on average constitute 7 percent of the cobbles on the shelf and continental slope south-east of the Faeroe Islands, but have not been found on the south-eastern side of the Faeroe-Shetland Channel. In dredge haul 5 on the edge of the Faeroe shelf 11 out of 41 cobbles consist of variable tuff carbonate sediments.

Cobbles of »other sediments« and »metamorphic and plutonic rocks« greatly predominate on the south-eastern side of the Faeroe-Shetland Channel, and they make up about 45 percent of the cobbles on the north-western side of the channel at 400 to 700 meters depth. The proportion of »other sediments« to »metamorphic and plutonic rocks« is about 7 to 2 from the stations on the south-eastern side of the channel, but about 2 to 1 on the north-western side of the channel, whereas the relative abundances of the various types of sandstones are roughly the same on both sides of the channel.

This broad distribution of rock types is similar to that described by *Berthois* (1969), who has made several dredge hauls

in the same general region. The number of erratics dredged is not stated, but seems to be very small at most stations. All but one of the dredge hauls south-east of the Faeroe Islands, including four at about 400 to 600 meters depth, contain only basalts (fig. 2). In contrast, in the dredge hauls south of the Faeroe-Shetland Channel basalts either occur together with sediments, metamorphic rocks and/or plutonic rocks or they are absent. *Berthois* (1969) mentions no tuff carbonate sediments.

The origin of the cobbles

A probable beach gravel of local bedrock-basalt has been recovered at station 80 at about 175 meters depth on the submarine ridge making up the southern part of the Faeroe shelf. All three cobbles recovered at this station with the Pecten dredge and most of the small pebbles recovered simultaneously with the tube sampler are fairly rounded and consist of a weakly plagioclase-phyric basalt.

At most other stations, however, the cobbles are obviously glacial erratics to judge from the mixture of varied rock types, the presence of glacial striae on some cobbles and the wide variation in the roundness of the cobbles.

The basalts are closely similar in petrography to the basalts from the Faeroe Islands and there have not been found any varieties of basalt which do not exist on land. The different types of basalt on the Faeroe Islands occur mixed together, but in widely varying proportions depending on the geographical position and the stratigraphical level (*Rasmussen* and *Noe-Nygaard* 1969). The relative abundances of the different types of basaltic cobbles fairly closely correspond to the basalts in the upper series of the south-east central part of the islands (Sandoy, southern parts of Streymoy and Eysturoy and probably the adjacent shelf to the south-east) and therefore we consider that the majority of the cobbles have been derived from these areas.

The high relative abundance of erratics of tuff carbonate sediments at station 5 and the likely occurrence of two tuff carbonate concretions without signs of glacial transport on Sandoy Bank suggest that these sediments have been derived locally from the outer shelf. They are much softer than the basalts and they are therefore probably more widespread below the Quaternaty deposits than their number suggests. The tuffaceous beds on the Faeroe Islands lack carbonate and are usually red coloured; we have not found any sediments like these in the dredge hauls.

The ashes in the tuff carbonate sediments must have been erupted from the vicinity because some of the ash layers are several centimeters thich and coarsely sandy. The strong alteration points to a raher old age for the ashes. The sediments therefore very probably have been deposited in connection with the building up of the Faeroese basalt plateau, i. e. they are of Lower Tertiary age.

The other sediments and the metamorphic and plutonic rocks almost certainly originate from outside the Faeroe shelf. They are very scarce on the shelf itself, and on the slope, where they are abundant, there is a wide range of rock types. A palynological investigation of some of the sediments by *Finn Bertelsen* at the Geological Survey of Denmark shows a range of ages from Middle Devonian to Cretaceous. Most of the arkoses and many of the other sandstones have probably been derived from the Old Red Sandstone belt between Scotland and the Shetland Islands and most of the gneisses probably originated from the Caledonian metamorphic terrains in Scotland, the Shetland Islands and Norway.

Glaciological implications

We consider that the sudden decrease in the proportion of foreign erratics towards the top of the continental slope southeast of the Faeroe Islands is caused by the front of the Faeroese ice sheet standing along the edge or uppermost part of the

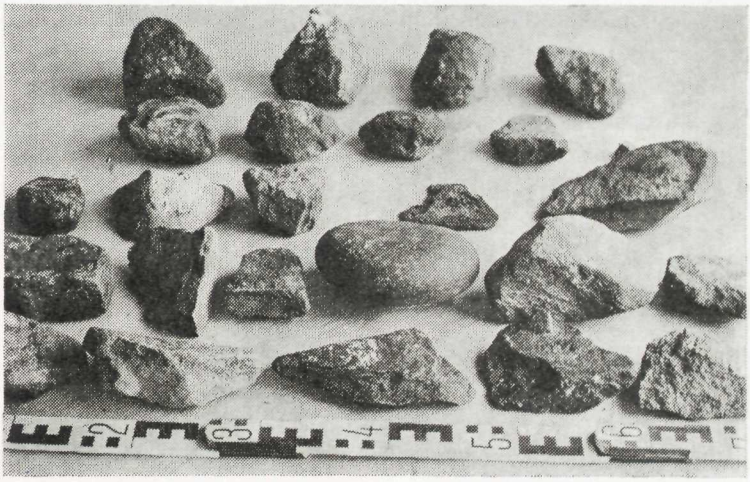


Fig. 3. *Glacial erratics from station 71. A centimetre scale is shown.*
3. mynd. *Botngrót frá støð nr. 71. Cm-mát sæst niðast á myndini.*

slope thereby preventing ice-rafting of foreign erratics over the shelf.

It is considered unlikely that the many foreign erratics on the Faeroese continental slope have been deposited directly by glaciers extending across the roughly 1200 meters deep Faeroe-Shetland Channel. A thickness of the Quaternary in the middle of the channel of roughly 450 meters has been inferred from a seismic refraction profile by *Talwani* and *Eldholm* (1972). However, if some of the Quaternary deposits are proper moraines and not ice-rafted, they must have been deposited by an ice sheet thicker than the depth of the channel. The post-glacial isostatic uplift of the nearby Shetland Islands has been less than the eustatic rise of the sea level (*Flint* 1971) and it is therefore unlikely that such thick ice existed during the last glacial epoch. We cannot exclude the possibility that the channel has been crossed by an ice sheet during an earlier glacial epoch, but then we would expect a complete covering of the moraines in the channel by later glacio-marine deposits.

It is not likely either that the sudden decrease in the proportion of foreign erratics is due to the stranding of icebergs along a former coast. The deepest dredge haul dominated by basalt is number 72[1]) at about 280 meters depth; this is much too deep for a strandline from the last glacial epoch. Because the Faeroe Islands are sinking slowly (*Jessen* and *Rasmussen* 1922, *Jessen* 1925) the strandline could possibly be from an earlier glacial epoch, but then again we should not expect to find any evidence of such an old strandline by dredging.

The few foreign erratics found on the shelf (about 4 percent) suggest that the Faeroese ice sheet covered the shelf during nearly all the last glacial epoch. In addition, the glacier front seems to have been stationary for a long time as the minimum distance between stations with close to 100 percent basalt and stations with about 50 percent basalt is only 10 kilometers (fig. 2).

The majority of the basaltic erratics on the shelf and slope were probably derived from the south-east central part of the Faeroe Islands, as mentioned earlier, and this suggests that the ice was moving. However, the high abundance of foreign erratics close to the glacier front suggests that the Faeroese ice sheet was less productive than the ice sheet on the south-eastern side of the Faeroe-Shetland Channel. This points to a rather small thickness for the ice on the shelf south-east of the Faeroe Islands. If the ice was not much thicker than the present water depth there should not have been any appreciable glacio-isostatic uplift of the shelf, and this may explain why we apparently find very slightly weathered beach gravel at about 175 meters depth at station 80 in the southern corner of the shelf.

We have mentioned earlier that the two troughs on the shelf

[1]) Dredge haul 72 contains 5 cobbles of basalt, and besides 19 pebbles of basalt, 1 pebble of tuff carbonate sediment and 1 pebble of sandstone. Dredge haul 75 and four dredge hauls made by *Berthois* (1969) are deeper and contain basalts only, but it is uncertain whether they are representive because the number of cobbles is either very small or unstated.

become shallower outwards and that at least the northern one is probably filled with Quaternary sediments. Thus the troughs therefore were probably sculptured by glaciers. However, the relative abundance of local erratics on the continental slope does not seem to be higher off the northern trough than off the banks, and therefore this trough has probably not been eroded much during the last glacial epoch and may date back to an earlier glacial epoch or possible even to the Tertiary.

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ABSTRACT

On the outer shelf and slope south-east of the Faeroe Islands down to 300 meters depth, 82 percent of the erratics consist of basalt and 14 percent of tuff carbonate sediments. At 400 to 700 meters depth these rock types only constitute 54 percent of the erratics, the rest being mainly sandstones and gneisses of distant origin. This sudden increase in the proportion of foreign erratics is probably caused by the front of the Faeroese ice sheet preventing ice-rafting over the shelf during the last glacial epoch.

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ÚRTAK

Longu fyri aldamótið varð víst á, at Føroyar vóru eitt glersetingarøki fyri seg, tí at ísskøvur gingu í allar ættir út frá oyggjunum og einki ísborið fremmant grót var funnið í landinum. Eingin hevði verið varur við ísskøvur ella á annan hátt ísmerkt landslag oman fyri 500 m og varð tí hildið, at ísurin hevði ikki rokkið longri upp.

Henda ritgerð, sum viðger spurningin um hvussu langt ísurin gekk út í landsynning úr Føroyum, tá hann lá víðastur, nýtir tilfar, botngrót, sum fingið er upp við kanningarferðum við »J. C. Svabo«, reiðskapurin var skeljadregg. Greinin er bara ein partur av einum meira víðfevndum botnkanningararbeiði, sum sett var í verk í 1971.

Uttarlaga á føroyska landgrunninum og á hellingini í landsynning úr Føroyum niður á 300 m dýpi eru 82 % av botngrótinum sum fingið var upp basalt og 14 % tuff- kabonat- legugrýti. Á 400—700 m dýpi vóru bert 54 % av hesum somu grótsløgunum, hitt var fyri tað mesta sandgrýti og gneis av fremmandum uppruna. Atvoldin til henda knappliga lutfalsliga vøkstur av botngróti av fremmandum uppruna er helst hon at Føroyaísurin, tá hann lá víðastur, hevur forða fyri at ísborið fremmant grót kom inn á landgrunnin.