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The Færoes

Author(s): Karl Grossmann

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# The Geographical Journal.

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## THE FÆROES.\*

By KARL GROSSMANN, M.D., F.R.C.S.E.

THE following gives a short general account of three visits made to the Færoes in 1892, 1894, and 1895. On all three occasions I was accompanied by my friend Dr. Cahnheim, of Dresden; in 1894 also by my friend Mr. Lomas, of Liverpool. We so constantly and completely co-operated in every work done, that in this present article, as well as in a few more that have already appeared or will soon follow, we have all three a share, if not in the actual writing, at all events in the observations and views expressed therein.

As a map, we had with us the latest edition of the Admiralty chart, which is based on a survey by Captain Born in 1806. During the past summer (1895) a new survey has been commenced by a staff of Danish officers, but it is not likely that it will be finished for many years; and judging from the samples of one or two districts which we were privileged to inspect, the work promises to be excellent.

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About midway between the west coast of Scotland and the south-east corner of Iceland, on the submarine volcanic ridge which connects both countries, a group of high peaks rises above the surface of the sea, forming a cluster of islands, called the Færoes. These islands, twenty-two in number, besides countless stacks, are mostly rocky and steep—so steep, in fact, that of their number nineteen only are inhabited by man, while the rest are scarcely accessible, and afford support only to numerous flocks of sheep.

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\* Paper read at the Royal Geographical Society, November 25, 1895. Fær-øer means Sheep Islands; hence it would be a pleonasm to speak of Færoe Islands. Fair Isle has the same etymology.

The whole group of islands may be divided into a smaller southern group, formed by Suderö and the small isles Lille Dimon and Store Dimon, and a larger northern group, which comprises the remainder, and stretches a long distance from the eastern to the western extremity (from the most eastern to the most western island) in one direction, and from north-west to south-east in the other.

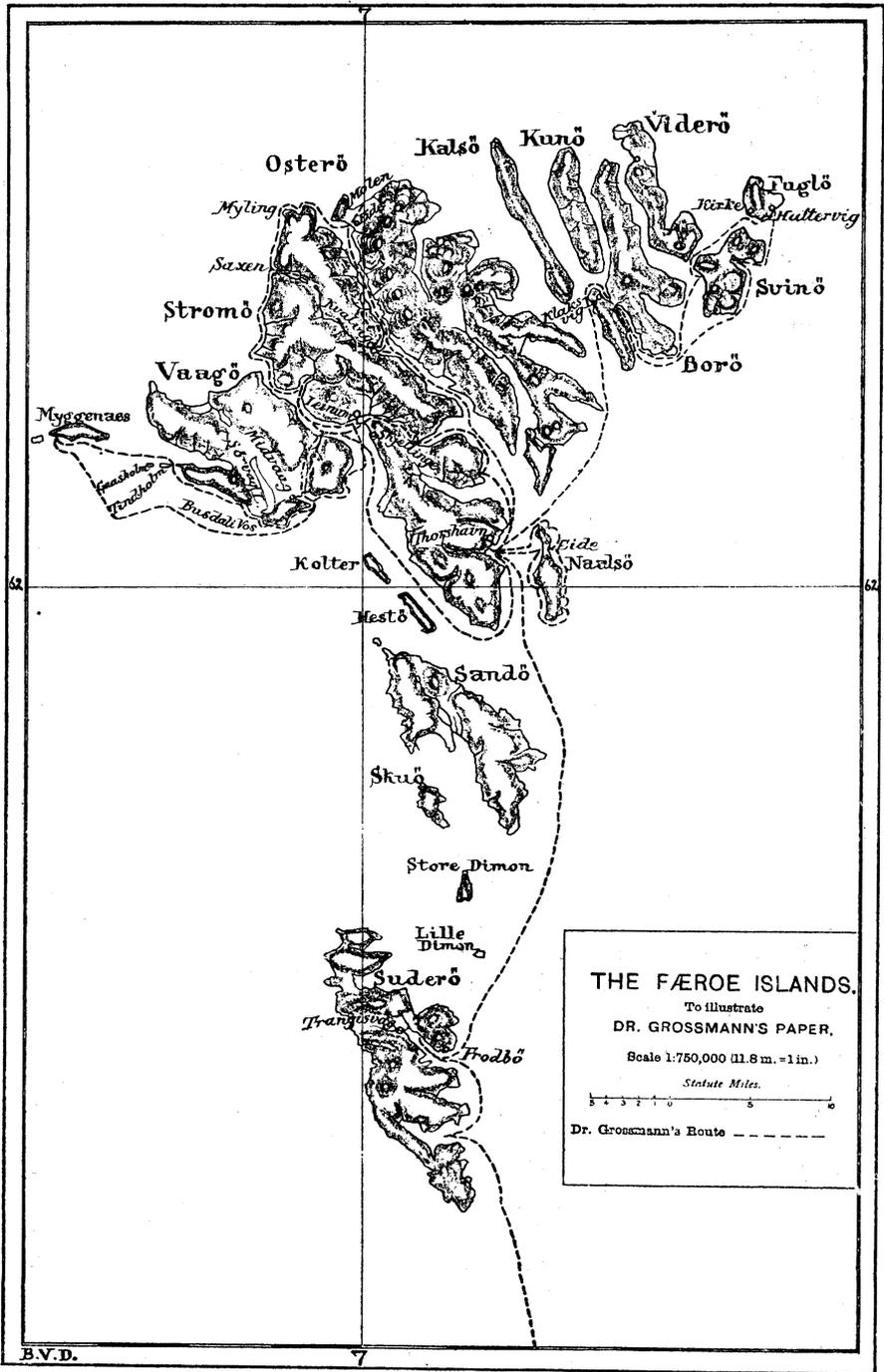
The general trend of the islands is from north-north-west to south-south-east. In this direction the mountains run and the principal fjords and valleys lie. If we were to draw a line from the most easterly to the most westerly point, from Fuglö to Myggenæs, it would cross the fjords and mountain ridges almost at right angles, and would mark the line of parting of the ancient icesheds and of the present watersheds. Along this line we find several saddles, or "cols," separating the northern from the southern part of a fjord; if the land were to sink only a few fathoms, these fjords would form separating channels like the one we see between the two largest islands, Stromö and Osterö. In that particular channel we find, on the spot which corresponds to the parting-line, a shallow called the "Sund," not more than 3 fathoms deep, where navigation is impossible except for small boats.

The geological structure of the Færoes is extremely simple, because of its great uniformity. The islands consist of a large number of layers of volcanic rock, consisting of vesicular as well as of more compact lava-flows with a generally low dip; hence a characteristic feature occurring so frequently in Færoese scenery—the straight horizontal outline of the mountain-tops. Often these lavas are exceedingly rich in amygdules, the cavities occasionally reaching a diameter of 2 feet and more. Exquisite zeolites are found in these cavities, and it is well known that the Færoes have supplied most museums with the finest specimens of these minerals.

Besides the amygdaloids and the lava, we find, though not frequently, columnar basalt in a few large intrusive sheets. The large sheet of Stromö at Skellinge has been known for a long time; in Suderö the basalt forms three fine sheets of columnar basalt, one at the entrance of the harbour just below Frodbö, another exposed close to the road at the western extremity of the village of Trangisvaag, in a quarry. High up above the village there is a third layer which stretches towards Frodbö.

The finest columns of all, however, were found by us in Myggenæs, at an altitude of 1400 feet, the thickness of the sheet varying from 60 to 80 feet. In the eastern islands we saw a very large intrusive sheet of basalt a little east of Kirke, on the southern cliff of Fuglö, and similarly one on the northern cliff of Svinö; possibly these two have formerly been parts of the same sheet.

In going from Kalbaksfjord (Stromö) overland to Leinum, we traversed an extensive sheet of basalt showing beautiful porphyritic



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structure; in a matrix of chocolate colour, the felspar crystals range up to an inch in length, and are grouped in crowded stellate clusters.

The minerals found in the rocky cavities are often of large size and great beauty. Zeolites of all kinds occur, chalcedony, chabasie, natrolite, stilbite, analcime, apophyllite, heulandite, also opal, both of the common and fiery variety; the latter is said to occur in a high mountain not far from, and to the east of, Leinum lake.

Two phenomena, as far as we know unique, were noticed, one on Naalsö, the other on Svinö.

Firstly: On the south-eastern coast of Naalsö there is a layer of 60 to 80 feet of dense doloritic lava. This layer is, broadly speaking, horizontal, and forms rudely shaped vertical columns of large dimensions. The columns, varying in thickness at different heights, present a wavy contour, and are split up again in secondary columns, which lie horizontally and at right angles to the wavy sides of the primary columns.\*

Secondly: The north-eastern cliffs of Svinö show peculiar holes of various size, perfectly circular, from half an inch to 2 feet in diameter. These round holes are the sections of perfectly straight horizontal tubes looking exactly like artificial bore-holes. They occur at various heights, but, generally speaking, not much above sea-level. Some of the wider ones were at least 15 feet long, and all were perfectly straight. Whether they are long drawn-out vesicles of unusual size, or how they have come about, is at present an open question.

The general arrangement of the strata of all the islands is not very far out of the horizontal line. The dip is seldom more than  $3^{\circ}$  or  $4^{\circ}$ ; only Suderö and Myggenæs have a steeper dip.

The cliff scenery is grand in the extreme. The rocks are cleft by vertical mastercracks, which form huge columns often extending to the whole height of the cliffs. Very frequently we find the cracks filled by injected dyke masses. These dykes have the typical horizontal columnar arrangement, and often branch into side injections. Seldom wider than 3 or 4 feet, they are most favourable starting-points for the attack of the destructive forces which are constantly at work to lay low the lofty cliffs of the weather-beaten coast-lines. Often we find that the sea washes out these injected masses to a height of about 30 feet; gradually a cave is formed, or a whole series of caves, until in time a cliff becomes completely undermined, and ultimately large masses break down and disappear (Fig. 5).

On the other hand, subærial erosion is equally powerful in its destructive work. Frequently we saw the rocky cliffs split down vertically, and many a time did we notice huge cliffs slid down after the manner of a fault, along the coast-line partly in the water, the upper part leaning upright against the rock from which they had parted. In this way

\* For further details, see *Proceedings Liverpool Geol. Soc.*, 1895, p. 302.

remarkably fine geological sections are revealed of over 2000 feet in height, and often so fresh that every detail of structure, every dyke, every lava-flow, every cavity, the dip, the occurrence of laccolites, etc., can be recognized with perfect distinctness.

*Coal* has long been known in Suderö. It has been worked there repeatedly, but never with any satisfactory financial result. The Danish geologist Johnstrup, who died last year, has published the best existing account of the occurrence of coal in Suderö. This summer (1895) a new survey has been made, and from private information I hear that for

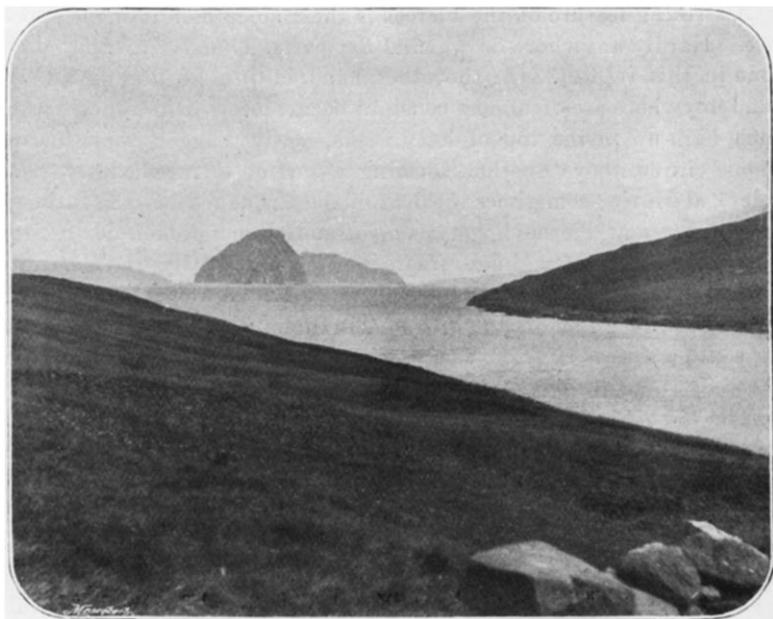


FIG. 1.—VIEW FROM LEINUM LOOKING SOUTH. THE CONICAL ISLAND IN THE MIDDLE DISTANCE IS KOLTER.

the future the working of the Suderö coal-seams promises to be a commercial success.

In Myggenæs, which had the reputation of possessing coal, we actually found some in two horizons, the one close to the landing-place, and the other at an altitude of about 1300 feet. The coal of Myggenæs is mostly of a glossy kind, almost like jet; the Suderö coal is in some parts glossy, in others brittle and soils the fingers.

Signs of glacial action are of frequent occurrence, but the influence of subaërial and marine erosion tends to efface them rather rapidly. Roches moutonnées may be seen throughout the whole group of the islands up to a certain altitude; excellent examples are found near Quivig, on Stromö, and along the western coast-line of Osterö, opposite

Qualvig, down to Eide. Well-preserved glacial striæ can be seen in Suderö (Fig. 7); glacial mounds also in Suderö, Svinö, Osterö, Stromö, etc.; boulder clay was noted in Trangisvaag, Svinö, Fuglö, Borö, etc.\*

From these observations there appears to be no doubt that the islands had a glaciation of their own, a conclusion which is inconsistent with the hypothesis of a big northern ice-cap. The remark in Prof. James Geikie's paper,† that there has been an ice-sheet coming from the northern group and intruding on the north of Suderö, will require a good deal of evidence before we can accept it, since we find everywhere the signs of local glaciation well pronounced.

A striking feature of the Færoes is their steep mountainous appearance. Hardly anywhere do we find flat parts, Thorshavn being almost alone in this respect. On the other hand, cirques as fine as could be found anywhere are of almost constant occurrence. Often these cirques reach high up to the top of lofty peaks, *e.g.* in Vaagö; sometimes we see one cirque above another, forming a sort of terraced valley, *e.g.* in Suderö, at Howe; sometimes the floor of the cirque reaches the surface of the water, *e.g.* at Tjornevig, on Stromö; and often a broken-down cirque is indicated by a few huge fragments, which testify to its original gigantic size, *e.g.* the island of Kolter (Fig. 1). A remarkable instance of this is also given in the case of Tindholt, the Drangar rocks, and the south-western cliffs of Vaagö, where a whole cluster of islets may be reconstructed into one large cirque (Fig. 6).

The *climate* is equable, the Gulf Stream preventing extreme heat in summer and cold in winter. Fogs are very frequent, and the annual rainfall is given as ranging from 70 to 80 inches, with 270 days of rain, *i.e.* three out of every four. Storms are also frequent, and to them is mainly due the absence of trees, there being but little soil to give hold for roots.‡ That there have been trees of a fair size in former times is shown by the fragments of stems and roots found in the bogs which yield peat. Probably these sites have been more sheltered in the past.

The journey undertaken in July, 1894, was favoured by exceptionally fine weather, and we were enabled to see more on that occasion than has been vouchsafed to nearly all previous travellers. Our desire to reach the easternmost isles—Svinö and Fuglö—could easily be realized. Equally successful were we in a visit to Myggenæs, the most westerly island, which, as far as I could ascertain, is inaccessible except on rare occasions.

When nearing Suderö, the usual veil of fog enshrouded the island,

\* For particulars, see the *Glacialists' Magazine*, June, 1895, p. 1.

† *Trans. R. Soc. Ed.*, 1880, xxx. p. 217.

‡ A climate of this description must, on the whole, prove rather unpleasant even to the natives. As for invalids, an indispensable requirement would be good hotel accommodation. But even if there were any hotel existing, these highly interesting islands, so attractive for the tourist, could hardly be recommended as a health resort.

and made it impossible to make out exactly which bay we were to enter. Several bays, almost identical in appearance, open towards the east, and it was excusable that our steamer entered the Vaagsfjord by mistake. Soon we were noticed by some of the inhabitants, who sent a boat to meet us and to tell us where we were. There was no difficulty after this in entering the bay of Trangisvaag.

We were, however, not permitted to land at once. It happened that the governor of the islands was one of the passengers of our steamer, which had sailed from Copenhagen and called at Granton. In Leith and Edinburgh some cases of small-pox had been reported; hence we hailed from an infected port, and had to fly the yellow flag. Such a

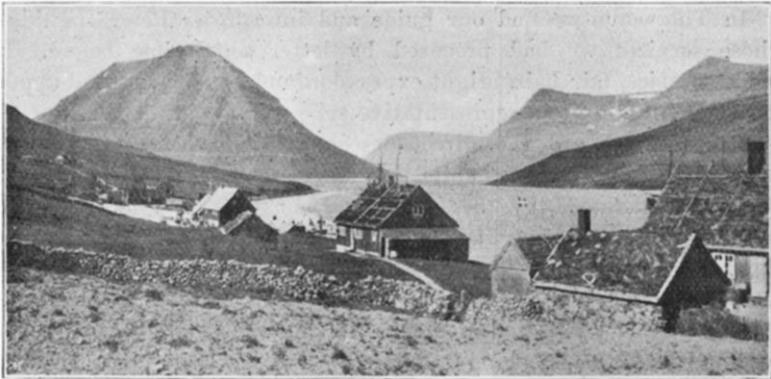


FIG. 2.—BAY OF KLAKSVIG LOOKING NORTH. THE PYRAMIDAL MOUNTAIN ON THE LEFT REPRESENTS THE SOUTH END OF KUNÖ.

precaution may seem over-careful in our own part of the world, but it appears that any infectious disease introduced into the Færoes is apt to spread amongst the whole population with great rapidity and severity. Similar occurrences are reported of other isolated parts, *e.g.* St. Kilda, etc.

The governor, with true consideration for the people in his charge, had, soon after leaving Granton, insisted upon the revaccination of all those who wished to land in the Færoës and had not been vaccinated within the last six or seven years. When, therefore, the doctor of Trangisvaag had visited our steamer and found everything in order, the quarantine came to an end.

As soon as this became known, a number of native boats approached the steamer to receive any cargo intended for Trangisvaag. These cargo-boats are broad and heavy, and are manned by three or four men. When all the cargo had been discharged, the shipping of "export goods" began, consisting almost exclusively of dried fish. This is a somewhat slow process, as almost every fish is handed singly into the steamer. But time seems not very valuable in high latitudes. At last a peculiar piece of cargo had to be taken in, *viz.* an invalid, who,

suffering from necrosis of the leg, was hoisted on board in a coffin-shaped box well stuffed with bedding. His destination was the little hospital in Thorshavn.

After passing the new lighthouse of Trangisvaag, erected in 1893, we see before us a cloud-capped island rising out of the sea, and appearing, in the glow of the setting sun, like a smoking volcano, the conical "Lille Dimon," one of the rocky isles inhabited only by sheep. As we steam past the cap lifts, and the flat top of the island, so characteristic of the trap formation, becomes visible. The sea is boisterous, and four hours' heavy rolling and tossing are brought to a welcome end on entering the bay of Thorshavn, bounded on the north and west by the island of Stromö, and on the east by the long island of Naalsö.

In Thorshavn we find our guide and interpreter Peter Haraldsen, whose services we had procured by letter some time before. His handsome face, fair hair, bright expression, and general external appearance, make him quite a representative type of his countrymen.

The Færoese are the direct descendants of the Vikings, whose language and amphibious habits they have inherited. Their language is easily understood by the Icelanders, but, does not, like Icelandic, possess a rich literature; it is to all intents and purposes only a spoken language.

The Færoese dress consists, for the men, of a peculiar cap, usually of a blue and red striped woollen material, a dark brown woollen jacket, knee breeches, grey stockings, and shoes of undressed cowhide for rough wear, or of dressed calfskin for better wear. These shoes are worn by the natives of both sexes and all ages, and are tied above the ankle with a woollen cord, white for men, red for women. All these articles of dress are home-made from beginning to end. The women's dress shows no characteristic difference from that of our own country. The people have a bright, intelligent look, and often a great deal of beauty is seen, especially in the men and the children.

Arrived in Thorshavn, we paid a visit to our old friend Consul Hansen, who most hospitably placed his house at our disposal, and, with his amiable spouse, did all in his power to make our short stay in Thorshavn pleasant. His house is situated on the rocky promontory which divides the bay of Thorshavn into two unequal parts.

We now propose to take a stroll through the "town." Thorshavn, the capital of the islands, the residence of the governor and other officials, has a population of about 1300, with a big church, a new stone-built school, and the fort. Starting from Consul Hansen's house in bright sunshine, we have before us a characteristic Færoese sight—the rocky ground around the house is used as a drying-place for fish. Fish we find everywhere on such a day—on the little open space on the other side of the bay, on the hill on which the fort stands, and along the shore. On the latter we find women washing and cleaning some that have just been brought to land.

We now enter the main street, a narrow way leading between houses of characteristic appearance. The foundation is very simple, large and small blocks of rock being piled together into a wall; often a huge out-cropping rock, planed and scratched by glacial action, is utilized for such purpose, and any interstices in that part of the house-walls are filled by imported mortar. The main portion of the house is made of planks, also imported, and generally tarred. The roof is formed first by rafters; on these the bark of Danish birch is spread and fastened, and a layer of grass sods is placed on the top, giving the roof an appearance of great rusticity.

In this narrow street we found the house of the present "sysselmand" and post-master, Mr. Müller, for many years the representative of his



FIG. 3.—TINDHOLM FROM SOUTH.

native country in the Danish parliament. An excellent linguist, he is well known to naturalists by his collections of eggs, birds, minerals, etc.; and he has been an ever-obliging help to most of the few travellers in the Færoes.

Our stroll leads us to a small open space surrounded by houses of unusual picturesqueness. Very striking are the chimney-stacks, consisting mostly of a wooden shaft, sometimes enveloped in straw. Everywhere the windows are large, and hinged so that they can be opened, in this respect contrasting favourably with the houses in Iceland. Often a fine array of flower-pots, roses, carnations, mignonette, etc., adorns the window-ledges; and here and there a small flower-garden, a few yards square, has a gorgeous display of large red poppies, stocks, and other familiar flowers.

Up and down we follow the main street, the houses being built, not to make a terrace, but placed anyhow. Occasionally a "side street" attracts our attention by its picturesqueness: a staircase formed out of the solid rock, leading to a small lath house, which apparently blocks all further progress. These lath houses are used as "larders," in which the flesh of sheep is hung to dry. Exposed to the free access of air,

the meat is soon covered by a dry crust, which is said to keep the inside perfectly fresh and sweet for a long time.

Often we notice long sticks on which rows of fish are strung, forming the drapery of a gable.

The small brook which runs through the town was particularly dry during our visit; a pretty stone bridge leads across. Higher up the brook is used by the women for washing clothes. We found in the rocky bed several round holes, which one of my companions felt inclined to interpret as "potholes," or glacial mills. I was somewhat sceptical about them, and at last elicited a different explanation of their origin. It appears that the Færoese are well acquainted with the dyeing properties of various lichens. After maceration, the lichens are pounded with stone pestles on a slab of rock, and, in order to have water near at hand, the process is carried out on the elevated parts of the river-bed. By constant pounding these pseudo-potholes have attained their present size and shape—an interesting warning not to be led into a trap by a scientific explanation where the possibility of artificial causes are possibly responsible. It may here be mentioned that all their woollen garments are dyed as well as manufactured by the Færoese themselves.

A little further on we see a brooklet bridged over by a grass-covered house, and close by an old water-mill with vertical wooden wheels after the style of a turbine, the water on the occasion of our visit being completely absent. Here we met one of the only two horses that we saw on the islands. The horses, hardly used at all, are very small and shaggy, and resemble Shetland ponies. As there are scarcely any roads at all, and all traffic is carried on by boat, the horse is an encumbrance and practically of no use. The owner of this one, a particularly handsome Færoese, found no market for him when he offered him for sale.

Passing the fine new stone-built schoolhouse, we come to the church. A glance within shows us the spacious though rather bare interior, broken by a balcony. On either side of the altar is an old tombstone, the one to the north with an old Danish inscription, the other with remnants of a much-weathered design. We proceed further and reach the governor's house, a stone building, quite imposing by contrast to its surroundings. Situated on the brow of a hill, it commands a splendid view across the bay, and has the finest garden in the islands.

From there it is not far to the "fort," an insignificant structure which serves as a bridewell. In its grass-covered grounds we see four interesting old cannon, which are now only used for peaceful salutes on the birthday of the King of Denmark.

Opposite the fort is the island of Naalsö, a long narrow ridge stretching from south to north. Naalsö is well worth a visit, especially to the geologist and mineralogist. There is only one settlement in the northern part, Eide by name, a thriving village. On the southern

extremity a lighthouse has been recently erected. An isolated rock south of the lighthouse shows clearly by its profile that it once formed part of the main island; how the eroding action of sea and weather has carved out this rock is well illustrated by the natural arch just below the lighthouse. To this sea-worn perforation the island owes its name, Naalsö being the Danish for Needle-island. It is easy to understand how in time the site of the present lighthouse will be separated from the main portion of the island, and form a stack similar to the one now existing south of it.

In the south-east corner of Naalsö we find the peculiar rock formation mentioned in the introduction.

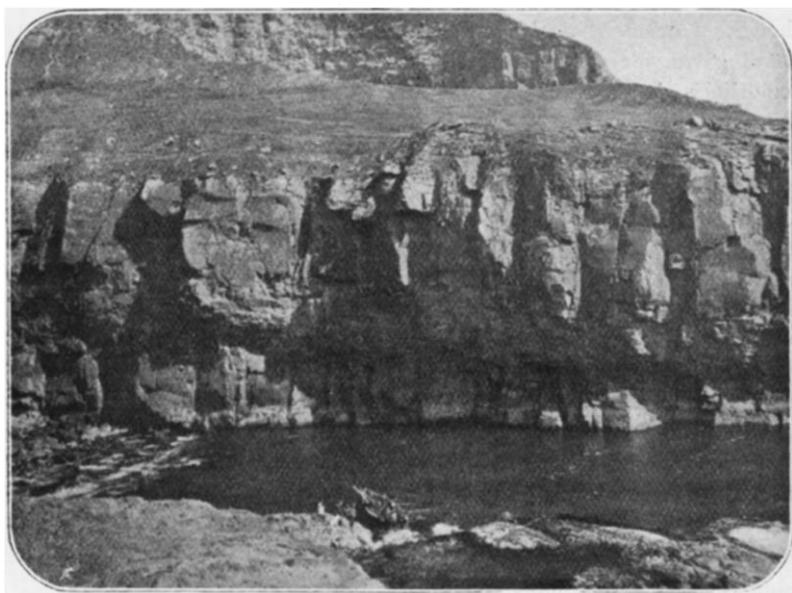


FIG. 4.—MYGGENZES—LANDING-PLACE WITH BOAT.

We now visit the eastern group of islands, and start from Klaksvig, a small but important settlement on the island of Borö. Klaksvig is situated in a well-sheltered fjord, difficult of access for a large steamer, but well protected against rough weather (Fig. 2). The settlement consists of a number of houses mainly on the western side. Towards the north the pyramidal end of the island of Kunö forms a stately background, showing clearly the horizontal layers of the trap formation. Looking south-south-east up the fjord, we see the end of the bay formed by a low isthmus, a col, on which are situated the church and the schoolhouse. A peculiar feature in the village is a long wall, reaching down from one of the houses to the water's edge. This

wall attracts our attention at a distance by a number of regularly distributed white spots, which, on nearer approach, are found to be the skulls of the small whale called "Grindeval"—*Globiceps melas*. This whale measures four to six yards in length, and occasionally visits the fjords in large numbers, where it falls a prey to the united strength of all the available male population of the islands.\*

After exploring the Klak, the mountain above Klaksvig, where some fine specimens of opal were collected, we prepare for a visit to Svinö and Fuglö. Crossing the isthmus, we meet the boat and crew awaiting us already. In fine weather such a sail is delightful. The boats are built with stem and stern alike for convenience in landing, and are manned by six, eight, ten, or twelve men. The oars are long, with narrow blades, not more than  $2\frac{1}{2}$  inches across, and are fixed with thongs of dried whaleskin, so that they do not feather. The reason I heard given for this was that during the long stretches of rowing—sometimes six to eight hours without stopping—feathering would be too fatiguing, and the narrowness of the blades reduces the resistance of the air to a minimum. A sail, in some cases two, can be set; but it can only be used when the wind is in a favourable quarter.

A glance at the coast-line shows that, in case of capsizing, no possibility of escape would be left, the islands being mostly girt by overhanging cliffs extending for miles. Keeping well inshore owing to the tidal currents, this part of our journey would have been somewhat monotonous had we not had frequent opportunities, just there, of watching the behaviour of that peculiar bird of prey, the lestris. This gull, unwilling to dive into the water for its own food, closely watches the graceful tern, *Sterna arctica*, and, as soon as it sees the latter catch and swallow a fish, it persecutes and frightens the bird until the fish is disgorged and dropped, the lestris catching the dainty morsel while still in the air. Though disgusting for more than one reason, the whole act is done with such surprising skill that one cannot help admiring the mean robber for its adroitness.

After a few hours of hard rowing, we reach Svinö from the south-east. The little village is situated on the slope of a col between the two blocks of mountains which form the island. Ample traces of glaciation are found on this isthmus—moraine hills, boulders, roches moutonnées—all more or less well preserved. Fairly high up is the church, a building much larger than we had expected to find in that secluded spot. It has a fine altar-piece, copied from a well-known modern Danish picture.

\* For want of time, I cannot here enter into the mode of capture employed. I may, however, mention that the number of whales caught seems greatly exaggerated in the descriptions given of late. In a recent paper (*Verh. der Ges. f. Erdkunde zu Berlin*, 1894, No. 6, p. 324), Prof. Moebius gives the number of globiceps caught in the Færoes annually as 50,000, whereas the actual number caught during the ten years from 1885 to 1894 was 4873, or about 480 per annum.

In spite of the heavy fog which descended on Svinö, we tried a visit to Fuglö, the easternmost island. From the distance we just recognized through the mist the form of a broad cirque, steep on all sides, and accessible only at its apex, where it touched the sea-level. When nearing Hattervig the fog lifted, and revealed the great height of the eastern cliff, the western cliff being not much lower. The landing was not quite easy, the harbour being a sloping rock surface of uneven amygdaloidal basalt, intersected by numerous dykes, and rich in zeolites.

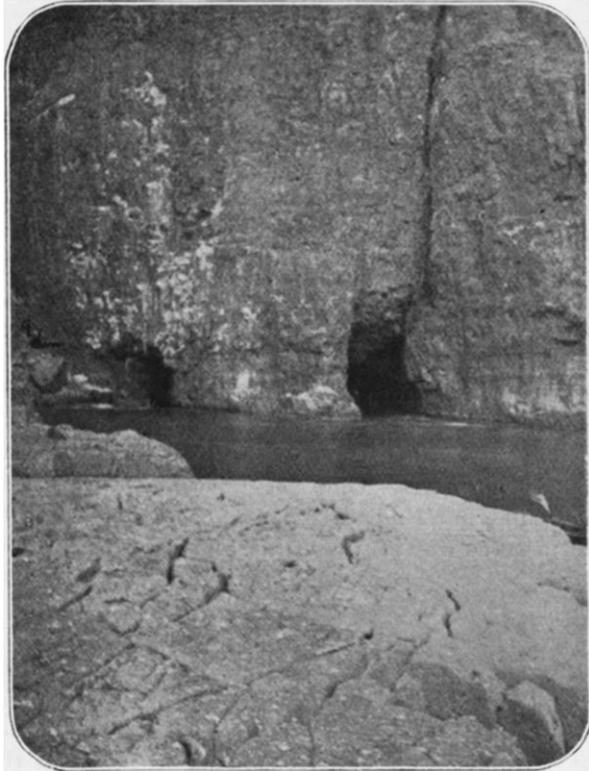


FIG. 5.—CLIFF SOUTH OF SAXEN (STROMÖ), SHOWING THE WEATHERING OF DYKES AND FORMATION OF CAVES.

From the harbour a grass-covered slope leads to the village. The little church, like most Færoese churches—even the very smallest—has two entrances, one on each long side; not so much with a view of easy access, but in order to keep the weather side closed on the frequent occasion of stormy days. The village itself is of primitive appearance, some of the houses looking somewhat like earth huts. There are better houses as well, *e.g.* the house which gave us most generously that hospitality which is such a pleasing feature for the traveller in every part of the Færoes. This house has, perhaps, the most picturesque of

the many quaint rooms we saw in the islands. It is a sort of kitchen, a large square room, the ceiling low, the floor of earth; along three sides of the room are seats with beds let into the wall; the fourth side is occupied by a huge hearth with beds on both sides. In the centre of the hearth was a wooden box, about four feet square, half full of ashes, and used as a fireplace. Over the glowing turf hung a kettle, suspended by a rope from a beam span across the primitive chimney. All sorts of foods were suspended therein to dry in the smoke, while a large assembly of the family and their friends sat chatting round the fireplace.

On our way back we found the skull of a grindeval and other parts of the skeleton. Not very far from the landing-place we noticed, fairly high up on the rocks, large pieces of driftwood, one completely riddled with teredo borings while floating in the ocean.

In this, and also in a few of the other islands, a peculiar kind of anchor is used, made of a large piece of basalt rudely hewn into a four-sided prism. The flukes, four in number, are formed of two long iron rods bent into appropriate shape. They are very interesting, inasmuch as stone anchors are not frequently used in other parts of the world at the present day, *e.g.* on the River Plate; they have evidently been introduced into the Færoes by the Vikings.

We now leave the eastern group and turn towards the west. Our goal is Myggenæs.

The difficulty of visiting Myggenæs consists in the almost complete inaccessibility of its shores. Only under most favourable conditions of weather and wind can a landing be accomplished, and that solely at one single point near the western end of the south coast. So uncertain and dangerous is the process of landing there, that occasionally, after landing has been effected, it may be impossible to embark again for three or four months. This interesting prospect was, however, in our eyes only an additional charm to the many attractions of Myggenæs. On the morning of our intended journey the weather was not favourable. The sea was running high, and our boatmen did not dare to row us from Leinum out into the open sea, and only brought us across the fjord, so that we had to walk overland on the island of Vaagö until we reached Midvaag. There we secured a bold and muscular crew of eight men, who promised to try how far they could venture. They did not give us much hope of reaching Myggenæs, still less of being able to land. The scenery along the south coast of Vaago is very imposing with its vertical or overhanging rocks, *e.g.* Trelle Nypen. We pass the Busdali-foss, the largest waterfall in the Færoes. The water, the outflow of the largest lake, "Sörvaagvatn," falls in a few cascades over the layers of basalt, forming a regular staircase. From time to time the ocean swell sends up the foam of its breakers from below to meet the waterfall halfway. Owing to the state of the tide and wind, we have to leave the shore

and row out to sea. In the misty distance we see Myggenæs before us, rising out of the water dim and mysterious. As we come nearer after a few hours of persevering rowing, we perceive the western extremity to be separated by a narrow crack from the main island, and we now steer straight towards that point. At last we approach the harbour, a small bay opening south, and bound on east and north by perpendicular cliffs about 80 feet high, while the western side is formed by steeply sloping seaworn rocks, over which the furious waves break in white foam. Our boat had been observed from the island, and when we neared the harbour the natives had gathered on the top of the vertical cliff (Fig. 4) and shouted to our crew. The roar of the surf made it impossible

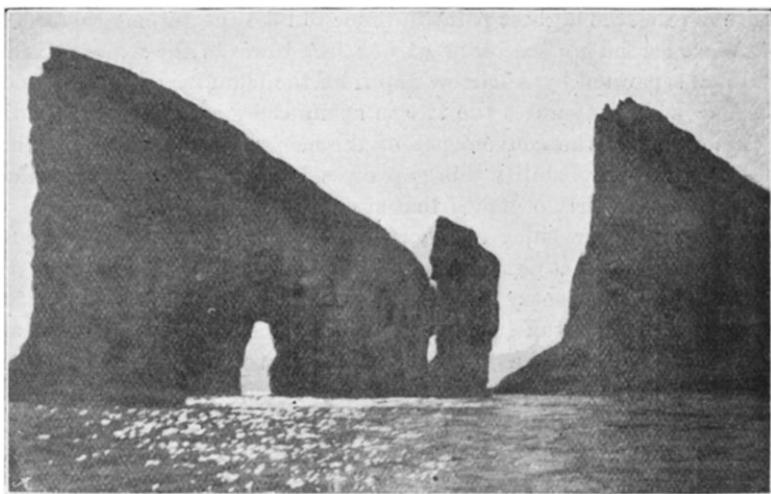


FIG. 6.—DRANGAR AND TINDHOLM FROM NORTH-EAST, THE UPPER SURFACES GIVING PROFILE OF CIRQUE.

to understand what they said, but Peter translated their gestures by informing us that it would be necessary to haul us up the cliffs by ropes—a performance which we did not quite fancy. At our request our men tried again and again to land us on the sloping rock ledges, and finally this was effected with the help of some of the natives. We were pushed or rather thrown out of our boat one at a time by our men, and received by the natives on the rocky ledge. In this manner we set foot on Myggenæs, not quite dry, but certainly much less damp than we might have expected.

After we had landed, the men had hard work to get the boat on the rock, the waves dashing high up and threatening to pulverize our little craft; but finally the *Friggjarin*—that was the name of our boat—was safely landed and drawn about 80 or 100 feet up the rock, so as to be safe from any sudden squall that might spring up.

Thus at last had we gained Myggenæs after twelve hours' struggling;

when it would be possible to return nobody knew. Nor did we much trouble about that for the moment; we had safely landed our cameras, barometers, and other goods, and so far we had no cause for complaint. As it was already late, we had only a short ramble in the immediate neighbourhood of the village, the only settlement on the island, situated some 200 feet above the sea and near the landing-place. It comprises about 30 houses grouped round a pretty little church, and sheltering some 150 to 200 souls.

On the following morning the weather had become beautiful, a clear sky and a bright, warm sun giving great charm to the grand lonely scenery. In favourable light the harbour was photographed, and then we set out on a systematic examination of the island, with the desire to reach the highest point in order to take the barometric reading.

As we ascend we see below at our feet towards the west the island of Holm, separated by a narrow gap from the main island. The cañon-like gap which separates the two is spanned by a wire rope on which a cage runs, for the convenience of the men when looking after their sheep. In all probability this gap owes its origin to the removal of a dyke which formerly occupied that site.

Plenty of sheep enjoy the short but fine grass on the south-western slope of Myggenæs. At a height of 900 feet we get a glance at the magnificent coast scenery of the northern shore. The thick alternating layers of lava and tuff have a greater dip in Myggenæs than in any of the other islands, the dip reaching  $18^{\circ}$  in the western part. These rocks form nearly vertical walls, that make landing utterly impossible. Many a fine stack, 200 or 300 feet high, stands like an outpost a little distance from the cliffs, testifying to the destruction which goes on there continually.

Large colonies of sea-birds inhabit the rocks, puffins being plentifully represented in this locality. They are quite tame, and are not frightened when approached within a few yards.

Ascending still higher, we find an intrusive sheet of basalt 60 to 80 feet thick. The columns are certainly the finest we saw in the Færoes. Reaching the summit of Myggenæs, our exertions are rewarded by a magnificent view. Toward the north-east, the cloud-covered cliffs of Stromö; to the east, the western bay of Vaagö, the Sörvaagsfjord, with Tindholm and Gaasholm in front of it; then further, almost lost in the blue haze of the horizon, Sandö, Skuö, Store Dimon, Lille Dimon, and lastly Suderö.

The barometric reading, compared afterwards with sea-level, gave an altitude for the summit of Myggenæs of 1750 feet.

Towards the east a magnificent cirque lies beneath our feet, and we can see from our position that the coast is as inaccessible on the south side as on the north.

Signs of glaciation were noted up to a height of 1500 feet. Above

that the rocks are craggy, and angular fragments of stone fallen from the higher points are scattered in profusion. Just above the limit of glaciation a bed of brown soily substance, 10 to 15 feet thick, and strongly impregnated with humus, forms the surface; the grains are extremely small and regular, and no traces of big fragments—not even as large as a pea—were noted. A rude attempt at stratification could be made out, not very pronounced. This soil has probably been formed by chemical disintegration of the basalt rocks *in situ*.

At an altitude of 1300 feet we found coal in small quantities; also again at a much lower level, close to the landing-place. The inhabitants

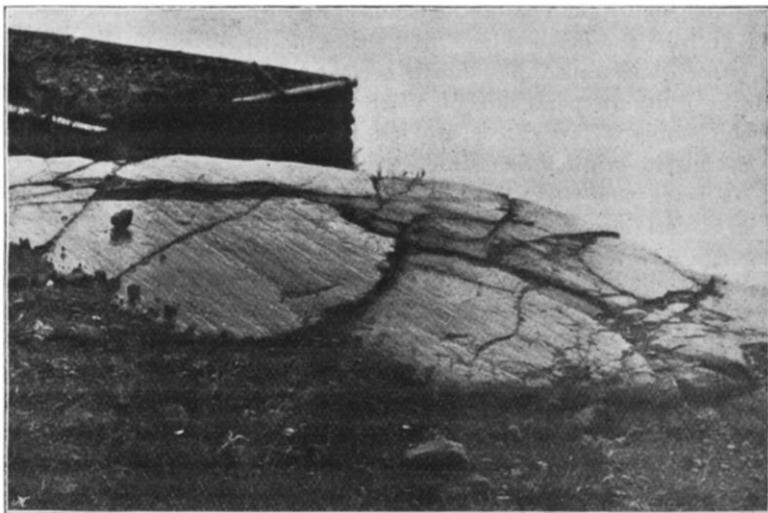


FIG. 7.—GLACIAL STRIÆ AT TRANGISVAAG.

brought us fairly large pieces of coal found by them at the bottom of a cliff on the southern coast; this coal is highly glossy, and breaks with conchoidal fracture.

The day being so fine and favourable for embarking again, we thought it wisest to seize this opportunity of returning to Vaagö, as we did not relish the idea of remaining in Myggenæs for an indefinite time.

Thanks to the perfect day, we found the embarkation much easier than the landing on the previous day. With the help of the swift tidal currents, Myggenæs was soon left behind, and we reached the fantastic-looking island called Tindholm (= tooth island) (Figs. 3 and 6). On the previous day we had seen it at a fair distance from the south, the Drangar, or stacks, eastwards. This day we passed on the north of Tindholm, in close proximity to the island. Not a breath of wind could be felt. Nevertheless, the tidal currents were sufficient to toss our little boat up and down so much that it was hardly possible to stand up or to take any

photographs. The scenery was, however, too fascinating not to make some attempts, which happily turned out successful. The profile of Tindholm resembles the tooth of a saw, and its serrated upper edge, seen broadside, equally justifies the name given to the island.

It requires enormous exertions to force a little open rowing-boat through the powerful mælstrom on this rocky coast, but our men are experts of no mean order, and we pass safely the two Drangar, huge stacks separated from Vaagö by the eroding forces of sea and weather. One of these stacks is narrow; the other, broader, is already perforated by a natural arch, and will ere long become divided into two stacks, and in time share the fate of complete destruction with Tindholm, Gaas-holm, and finally the rest of the islands (Fig. 6).

Both from the north, where the slanting upper surface of these stacks can be seen, and from the profile, it is clear that Tindholm, the Drangar, and the southern peninsula of Vaagö, formed once one large cirque, of which only a few shreds are left standing—sufficient, however, to reconstruct its original form in our mind's eye.

We leave this part of the Færoes—possibly the most picturesque, as it is certainly the least known—and, after passing the Witch's Finger, a pointed rock separated from the parent cliff by a vertical rent, and looking ready to fall into the sea, we reach Quivig, on Stromö.

Journeying on land, we come to the beautiful Leinum lake, perfectly circular, and situated in a district rich in exquisite zeolites. In the background of the lake is situated a high mountain reputed for its wealth of opal, both common and fiery. Unfortunately, our limited time did not allow us to verify this report.

High up, to the south-west of the lake, the large basaltic intrusive sheet of Skellinge is seen. A little to the south-east of Leinum lake, the summit of the col is reached. This point is situated on the main parting-line of ice and water mentioned in the beginning of this paper. Not very far off we find a huge boulder left by the ice close to the watershed, which it is hardly possible to mark out with exactness on the flat-topped col.

The farm at Leinum is in a well-kept condition. Our attention was attracted by a fine specimen of hand-quern which we saw in actual use. These querns were met with in various places, *e.g.* Thorshavn and Svinö.

From Leinum we take a boat, and, within view of the islands of Hestö, Kolter, and Vaagö, we row northwards to the bay of Vestman-havn, which forms the finest harbour of the islands. The coast-line is sloping and well covered with grass; a brook tumbles down in gentle cascades on the south-east side of the bay. The tidal whirlpools in this fjord are very remarkable. I noticed in several places large circles, about 30 yards in diameter, perfectly smooth, their level nearly 6 inches above the surrounding water. At the circumference of these smooth

plaques a regular cascade was formed, where an equalization of the level of the water was attempted, without success, owing to the great force of the intruding tide.

From Vestmanhavn northwards, along the western coast of Stromö, the most imposing cliff scenery of all the islands is seen. For many miles the rocks rise perpendicularly out of the sea to a height of between 1500 and 2400 feet. All along these miles of vertical cliffs, each of which presents a magnificent geological section with every detail of structure recognizable, there are not more than two or three spots where a rowing-boat can land or a foothold be found in fine weather. Even then there would not be the slightest chance of scaling the cliffs; while in rough weather landing is altogether out of the question.

These cliffs are the nesting-place of countless myriads of sea-birds. Already from a distance their presence can be recognized by the white patches, denoting the abode of the terns, kittiwakes, puffins, gulls, alks, etc., which, on our nearer approach, fill the air with deafening cries. The more or less horizontal strata of the rocks are of various degrees of hardness; the softer parts weathering out, ledges and hollows are formed which are used by the birds as nesting-places. The birds often crowd together to such a degree that it seems as if there were no room left for a single bird more. These bird-rocks form a valuable property for the parish to which they belong. At the time of hatching, the men band together and go fowling on the cliffs. This is a most dangerous occupation, and it is no wonder that many of the strongest and healthiest of the population fall a victim to it every year. Three or four of the men approach the top of the cliff from the land side; then one of their number is let down by a rope, and, half dangling, half crawling, he reaches the birds' habitat. Then, with a large net fixed on a pole, he rakes out of the nests whatever he can reach. The frightened birds become entangled in the meshes, and are caught by the fowler, who twists their necks and throws them down into the water, where they are picked up by boats in waiting. In this way, thousands and thousands of birds are killed and stored away as food for the winter. This is the only way they are caught; shooting is carefully avoided, lest the report of the guns should frighten them away altogether. We were fortunate enough to witness this bird-catching in various parts of this coast; also in Myggenæs, Svinö, and Naalsö.

The west coast of Stromö gives excellent opportunities for studying how the erosion by sea and weather takes hold of these gigantic walls, which look as if built for eternity. The caves, which are produced at the sea-level by the washing out of dykes and cracks, have often most fantastic forms. Sometimes they are arched like a Gothic vault, resembling Fingal's cave or Nuremberg architecture; in other parts we see a flat horizontal roof covering mysterious inlets, reminding us of the entrance to the lethal chambers of the Pharaohs. In many of

these caves seals used to breed, but the irrational way in which the natives slaughtered them has finally driven them away altogether.

As we row further north we encounter many a fine example of rocks that have broken off and slid down as stacks, which are now separated from the main rock by a narrow rent barely wide enough to admit our small boat. A visit to the interesting old harbour of Saxen was carried out under some difficulties. It is now so completely silted up that even our little craft could not enter more than a hundred yards, and we had to wade through the banks of finely ground grains of basalt; not a grain of quartz could be found in spite of careful searching.

At last we see before us the steep cliff of Myling head, at the northern extremity of Stromö. To the west this cliff drops into the sea as a straight wall nearly 2400 feet in height, while its eastern side is formed by the gentle slope of a beautiful cirque, dipping to the level of the fjord at Tjornevig, whence it can be scaled without danger.

Rounding this corner, we enter the fjord of Eide, where fine examples of roches moutonnées and striæ are seen on every hand.

Eide, a flourishing settlement on the north-western point of Osterö, has a fine church, and is one of those places where we found exquisite apophyllite and chabasic. From Eide we went up the fjord to Nyboder, where a Norwegian whaling station had been erected that summer. As the steamer was just out at the time of our arrival, we proceeded temporarily to Qualvig (= whale bay), a little further south on an inlet of the fjord. In this large bay there happened to be four "bottlenose" whales which had strayed there, and were evidently in no hurry to leave. Most likely they had found an abundance of food, which had attracted them. When we arrived they had been there three or four days already. Northwards they could not escape, the "sund" being too shallow for them; and, as they had made no attempt to leave by the southern part of the fjord where they had entered, a large schooner had come from Thorshavn to capture them by means of a ridiculously small rowing-boat and a little rocket-harpoon. Needless to say, the efforts of this boat proved unsuccessful. The mode applied for the capture of the globiceps could not be applied; the nets with which the grindeval is imprisoned within the fjords are far too weak for such big game as the bottlenose, and would have been completely destroyed without hindering his escape in the least.

In Qualvig we had an opportunity of studying the interior of an old-fashioned well-to-do Færoese house. Very quaint is the stove—an iron box built through the wall of an adjoining room or kitchen, where it is fed, so as to heat both rooms with a minimum amount of fuel, which here, as almost everywhere in the islands, is peat. We often saw men carrying peat on their backs in big lath boxes, supported by a broad strap across the forehead. The beds in these farms are also noteworthy. Often they are let into the walls like berths in a ship,

after the Icelandic style. Similarly, we found they were capable of being telescoped; but while in Iceland the beds can be made shorter or longer, the Færøese beds, always rather short, can only be altered in width, being thus adapted to the inordinately spare or stout rather than to the short and tall.

From Qualvig we returned to Nyboder, where we joined the whaler. We went out with the steamer *Urd* on a three days' expedition, and were successful in harpooning and bringing home one of the largest specimens of the great fin whale (*Balænoptera musculus*). As, however, time is already too far advanced, the details of this exciting chase cannot be gone into to-night.

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Before the reading of the paper, the President said : There are probably several here present who will remember the agreeable evening which Dr. Grossmann gave us, now nearly two years ago, when, by means of his photographs, he conveyed to us such a very vivid picture of the Icelandic scenery, and brought out some salient points in the geology of Iceland. I think we may anticipate an equally pleasant evening now, while obtaining a knowledge of the Færoe Islands through Dr. Grossmann's photographs and his graphic descriptions. I will now call upon Dr. Grossmann to read his paper.

After the reading of the paper, the President said : I think the meeting will agree with me that I was not a bad prophet, and that we have spent a very interesting hour in making the acquaintance of the Færoe Islands. There are many points in what Dr. Grossmann has said which might lead to discussion, but I regret to say that Sir Archibald Geikie, who has for two years running visited these islands, is unable to be present. He has, however, written down what he intended to say, and has sent it to me. I think it will interest the meeting.

Sir A. GEIKIE's communication : For two summers in succession I have visited these islands, and as I made the voyage each time in a steam-yacht, I have been able to circumnavigate the whole group, and to explore the greater number of its islands and fjords. Dr. Grossmann's paper recalls my own experiences and revives the very pleasant impression which both the islands and islanders have left on my memory.

The Færoes have a singularly uniform geological structure, and consequently a somewhat monotonous character of scenery. They are built up of level or gently inclined sheets of volcanic rock, which, however, is not "volcanic tuff," as the author of this paper seems to believe, but streams of once molten basalt. The tuffs, as in our own Hebrides, form a quite insignificant part of the whole volcanic series. These ancient lavas were poured out from numerous small vents, and not from any great central cone like Vesuvius. I was fortunate enough this summer to discover a row of these little volcanoes at the base of the western cliffs of Stromo.

There can be no doubt that, like the corresponding rocks of Antrim, Mull, and Skye, the lavas of the Færoe Islands were erupted on a terrestrial surface. They flowed over a wide plain, which they gradually heightened until its original bottom was buried under more than 2400 feet of volcanic material. The rainfall during that prolonged volcanic period was perhaps not very different from what it is in the same latitudes now. At all events, there was moisture enough to nourish abundant land-vegetation, and to fill with water the little hollows on the surface of the cooled lava-streams. Into these pools and lakes leaves from the surrounding woodlands were blown by the wind or washed by the rain, in such abundance as to gather among the silt of the water-basins into layers that became in the end beds of coal.

Eventually this wide plain or plateau of volcanic material sank down to some extent, so that its base is now concealed under the sea. Though I have diligently searched all round the Færoes for the original bottom or land-surface on which the basalts lie, I have never succeeded in finding the slightest trace of it. It has been entirely submerged.

But the most serious changes which have been wrought on the face of the Færoe plateau have been effected by the various agencies of denudation. By degrees its edges have been cut back until they now rise as stupendous precipices from the level of the sea. Its surface has been eroded into valleys, and as these have been depressed with the general sinking of the whole area, many of them are now occupied by the sea and form fjords.

These northern islands are thus a mere fragment, which has been cut into smaller fragments by the ceaseless progress of denudation. Their varied forms of surface are entirely due to waste, modified by the guiding influence of the rocks ; and as these rocks are so uniform in character, the resulting topography naturally

remains constant throughout the whole group. So far as I have been able to ascertain, no rocks such as the gabbros and granophyres of Mull and Skye, which might have given a central core of high ground, with different features of scenery, have broken through the basalts of Færoe. The islands have no mountains, in the proper sense of that word. Their highest ridges are merely portions of the same universal plateau made up of nearly horizontal lavas. The endless straight bars of rock-terrace, so conspicuous along the coast cliffs, may be traced even to the loftiest summits of the interior.

There is one notable difference between the Færoe Islands and the Inner Hebrides. Owing, perhaps, to their more northerly position and climate, their sea-cliffs are less mantled with vegetation than our verdurous islands, and afford, therefore, more continuous sections of their geological structure. I have never seen such colossal precipices of volcanic material as those of the north-eastern islands—vast walls of naked rock, where every lava may be counted from the waves below to the beetling crests more than 2000 feet overhead. And nowhere in Europe are the lessons of denudation more eloquently enforced. At every turn new proofs meet the eye of the stupendous erosion which, out of an original plain of lava, has slowly excavated these fjords and sounds, sliced down these precipices, carved out these buttresses and alcoves, isolated these sea-stacks below and these cloud-capped pinnacles above. Apart from the interest of their volcanic history, these islands well deserve a visit from every geographer and geologist who would wish to witness with his own eyes the most impressive memorials of topographical changes, and to realize—yet more vividly, perhaps, than he has ever been able to do before—how gradually the scenery of our globe has been evolved, and how large a part of this evolution is due to the winds, rains, and frosts that seem to act so feebly in the sculpture of the land.

Dr. Grossmann gives a pleasant and faithful picture of the Færoese islanders. They are, as he describes them, fair-haired, blue-eyed Vikings, accustomed from their boyhood to live on the sea, daring climbers, active and intrepid boatmen, frank, helpful, and industrious, building many a bright and busy homestead in their sheltered creeks, and, in spite of the hardships entailed by a boisterous climate and a rugged and rocky soil, gaining a livelihood in contentment and peace.

The PRESIDENT: We have to thank Sir Archibald Geikie for so kindly sending us what he intended to say. I also regret that our old friend Colonel Feilden has written to say that he is unable to be present this evening. There are reasons for believing that there is a very extensive volcanic area extending from the Færoes and Iceland over the sea-bed towards Greenland. I remember, when in the *Valorous*, a line of deep-sea soundings was taken from Davis Straits to the coast of Ireland, and our average depth was 1700 to 1800 fathoms, with soft sand and globigerinous ooze. One day, on an Icelandic meridian, but far to the south of that island, we came upon a depth of only 690 fathoms, and brought up bits of volcanic rock, so that there was evidence of a mountain 7000 feet high, rising from the surface of the sea-bottom. I think it would be extremely interesting if a careful survey could be made of the sea bottom between the Færoe Islands, Greenland, and Iceland southwards to about the 55th or 54th parallel, so that we might have a knowledge of the configuration of the sea bottom over that area. We should probably find a series of volcanic mountains reaching to within 500 or 600 fathoms of the surface. There are many other points of great interest which have been told us by Mr. Grossmann, but I should have been glad if he could have given us more particulars of the fishing of the Grindeval when those whales come up the fjords. We have only now to pass a vote of thanks, which I am sure you will all cordially do, to Dr. Grossmann for his very interesting paper, and I am confident that you will instruct me to convey to him your warmest thanks.