JOURNAL OF

THE TRANSACTIONS

OF

The Victoria Institute,

OR,

Philosophical Society of Great Britain.

EDITED BY THE SECRETARY.

VOL. XXXIV.

LONDON:
(Published by the Institute, 8, Adelphi Terrace, Charing Cross, W.C.)

1902.

ORDINARY GENERAL MEETING.*

THE REV. CANON GIRDLESTONE, M.A., IN THE CHAIR.

The Minutes of the last Meeting were read and confirmed, and the following paper, illustrated by maps and lantern slides, was read by the author :—

ICELAND: ITS HISTORY AND INHABITANTS.

By Herr JON STEFANSSON, Ph.D.

GEOGRAPHICALLY and geologically Iceland is part of, a continuation of, the British Isles, for it is situated on the same submarine mountain ridge, stretching from south-east to north-west across the North Atlantic, the average depth on it being 1,500 feet to 2,000 feet, while north and south of it 12,000 feet is the average depth reached by sounding. According to Prof. James Geikie, land connection between Greenland and the British Isles must have existed in Cainozoic times, for relics of the same Tertiary flora are found in Scotland, the Faroes, Iceland, and Greenland. The deposits in which this fossil flora occurs are associated with great sheets of volcanic rocks. This so-called Iceland ridge (or Wyville Thomson range) was at all events greatly upheaved in the Tertiary period, and thus an island, misnamed *Iceland* in the ninth century, 40,450 English square miles in extent, the largest island in Europe after Great Britain, rose out of the Atlantic, distant only 450 miles from Cape Wrath, on the north-west coast of Scotland, to Stokknes, in the south-east of Iceland.

It is as rational to call this island Iceland as it is to call an

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* Monday, April 21st, 1902.

ice sheet measuring several hundred thousand square miles Greenland. Iceland is not a bleak, arctic region, embedded in thickribbed ice, though its northmost peninsula, Rifstangi, projects about a mile north of the Arctic Circle. Situate between 63° 24′ and 66° 33′ north latitude, yet its thermic anomaly is such, owing to the Gulf Stream, that the mean temperature of the month of January at Stykkisholm, on the west coast of Iceland, is 34·5° F. higher than it should be in that latitude. It is surprising that January at Reykjavik is milder by ½° than at Milano, North Italy, or 1° F. milder than at Munich on 48° 9′ north latitude, *i.e.*, 3½° further south than London (51° 33′ north latitude), while the mean annual for the same place is but 1° less than at St. John's, 16° further south, namely, 39·5° F., or as much as that of parts of Asia situate over 17° (over 1,000 miles) further south. Grimsey, off North Iceland, cut in two halves by the Arctic Circle, is 5° F. warmer in January than Stockholm. The coolness of the summer, however, reduces the annual mean. The mean temperature of summer at Reykjavik is only 53° F. (July, 59·20° F.). The sea round the south, west, and east coasts of Iceland is never less than 41° F., while on the north coast the nearness of Polar ice, pack ice drifting down from Greenland occasionally every four or five years, causes a fall in temperature.

It will thus be seen that Iceland has a temperate climate, while the clearness of its atmosphere rivals that of Italy. "A medium of matchless purity" this combination of sea and mountain air has been well called, and it is most bracing and exhilarating, "like drinking champagne," an English traveller says in her book on Iceland. It is freer from microbes than the air of any part of Europe, and, according to the researches of Dr. W. L. Brown, the blood of an Icelander does, on an average, contain more hæmoglobine than that of other inhabitants of Europe.

No country on earth of equal size contains so varied and wonderful natural phenomena. The glaciers of Switzerland, the fjords, salmon rivers and midnight sun of Norway, the volcanoes, grottoes and solfataras of Italy—on a grander scale—the mineral springs of Germany, the geysers of New Zealand, the largest waterfall, next to Niagara, in the world, the Dettifoss, all are here. Nowhere has nature been so spendthrift in giving a geological lesson to man. If there be sermons in stones volumes lie unread here. Here we see her titanic forces at work building up a country.

Let us approach this wonderland. A high tableland out of which rise sharp peaks and glittering ice-fields, and into which run winding fjords, fringed by rocky islets on which the waves break in a white line of foam. You don't miss the forest which is not there, for the vivid brilliance of the air shows the glacier white and volcanic black, and sunset turns them to rich purple and violet.

Iceland is a plateau region, composed of older and more recent volcanic masses, not older than the Tertiary period, of an average altitude of from 1,650 to 2,000 feet, occupying thirteen-fourteenths of the island. It consists of basalt and palagonite tufa and breccia; the latter, the younger formation, in the centre and towards the south, while the greater part of the west, east and north coasts is of basalt, or nearly two-thirds of the island. The glaciers rise like broad domes from this plateau. In the south where the glaciers come down to the sea there are no harbours for 250 miles, from Djúpivogr to Eyrarbakki, for all the fjords have been filled up with detritus brought down by the glaciers. But the basaltic regions are cut and furrowed by numerous fjords. The basaltic formation is divided into two strata by the "surtarbrand"* formation of the miocene period, 60 to 100 feet in thickness, the fossiliferous layers occurring about midway up in the vertical faces of the basalt of the north-west. In these lignite strata have been found the remains of a vegetation of the American type when Iceland had a tropical climate.† The extensive forests of Tertiary times seem to have been overwhelmed by pumice, ashes and sometimes by flowing lava. Silicated tree stems are found in many places. The area of glaciers or ice-covered altitudes is estimated at 5,500 square miles, seven times that of Switzerland (710 square miles), comparable in size only to the glaciers of the polar regions. The Vatnajökull alone measures 3,300 square miles. The height of the snow line on the southern side of the plateau is 2,000 feet, on the northern side 4,300 feet, the air in the interior being much drier. The appearance of these glaciers is that of the Polar regions. The summits of the mountains are covered with flat or vaulted ice-fields from

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* *Surtarbrandur* is the Icelandic name for fossilized tree trunks, a convenient name for the whole of the Icelandic lignite strata.

† This lignite band has its representative in the Island of Mull and Co. Antrim.—Ed.

which glaciers branch out. The glacier explosions (*jökul-hlaup*, glacier leap) are peculiar to Iceland. They occur when there is an eruption of an ice-covered volcano. On such occasions extensive tracts of country are inundated and converted into an eddying current filled with floating ice. Within historical times fjords and bays have in this way been filled up. During the glacial epoch Iceland was completely overlain with an ice-roof or covering of at least 2,500 feet in thickness. Scorings and striations point to more than one glacial period in Iceland. There are many traces of the shifting of the shore in Post-glacial times, especially in the north-west; the highest shore line or raised beach being 250 feet above sea-level. There is a double raised beach in the north-west, and the coast is still receding.

On the harbourless south and south-east coast people live in little oases, isolated as islands, cut off from the rest of the isle by sand deserts and glaciers which come to their very door and threaten them perpetually—and under these sleep volcanoes. It is pleasant to find in this howling wilderness oases bright with flowers and fragrant with thyme and meadowsweet. Between the Skaptafellsjökull and the Skeiðarárjökull willows, angelicas and birches 21 to 22 feet high nestle in clusters, and there is even a mountain ash 30 feet high. All round every quarter of an hour is heard the thundering crash of ice blocks falling down on the muddy sands or into the yellow waters of Skeiðará, which changes its bed continually, moving over a mile, sometimes often in a day. Nowhere is it possible to study so well the geological conditions prevailing towards the close of the glacial epoch in Europe.

Iceland is the centre of a suboceanic volcanic region, and no region of the earth has an equal title to be called the *Land of Fire*. It owes its very existence to volcanic agency continued to-day and may be truly called the abode of subterraneous heat. No spot on the surface of the globe of its extent exhibits marks of fire in such a multitude, in such a variety and of such a magnitude. None contains an equal number of volcanoes. Nowhere have eruptions of such magnitude occurred. Dr. Thoroddsen has counted 107 volcanoes, 83 of which are a series of low craters or crater-chains, eight are of the Vesuvius shape, and 16 of the Sandwich islands lava-cone shape; 5,000 square miles of land are covered with lava. The post-glacial lava alone would cover

Denmark with a layer 16 feet in thickness. The largest lava-desert is the Ódáðahraun, which covers an area of 1,700 square miles, and is from 1,600 to 3,500 feet above sea-level. This lava field has been formed by the eruptions of about 20 volcanoes. The cubic capacity of the lava ejected here would make a solid cube each side of which would measure about 50 miles. The most frequent form of manifestation of volcanic eruption is the formation of a series of low craters often several miles in length, along lines of cleavage in the crust of the earth. The longest is that of Laki, 20 miles long, containing about 100 craters. Sometimes lava has welled up out of fissures without craters. The largest of these is Eldgjá, north of Mýrdalsjökull, 19 miles long, 434 feet deep, in one place 656 feet deep, bottom 468 feet wide. The volcanoes are not, as was formerly supposed, limited to the region of palagonite breccia. On the Faxa-bay are many small volcanoes which have broken through the basalt. About twenty-five volcanoes have been active in historic times (900–1900). Vesuvius is dwarfed into insignificance, for the lava-flood of the last eruption in Iceland, in 1875, has been computed to contain 31,000 millions of cubic feet, while in the largest eruption of Vesuvius on record, that in 1794, only about 730 millions of cubic feet of lava were ejected.

The lava field of the crater chain of Laki covers some 220 square miles, and the lava current flowed 47 miles away from the place of eruption. The longest flow of lava in Iceland is that from the craters of Fiskivötn, 90 miles long. On March 12th, 1875, a lava torrent forced its way 620 yards up an incline of 0° 25′. On March 29th, 1875, the pumice ashes of Mount Askja were carried over 1,000 miles away to Norway in eleven hours forty minutes, and in another ten hours to Stockholm. The column of ashes rising from Hekla was measured on April 21st, 1766, and was found to rise 16,500 feet above the top of the mountain; on February 5th, 1846, it rose 14,350 feet. On April 5th, 1766, a fragment of basaltic scoria was hurled from Hekla to Vidivellir, a distance of 103 miles.

The geysers have been so much written about that I shall leave them out and treat more in detail of the volcanoes of Iceland. Several new geysers burst out during the earthquakes in 1896, while the well-known Strokkur disappeared, having been in existence 107 years.

The crater chains and volcanic fissures run in certain directions, and there are at present two lines in active

condition. The one runs from south-west to north-east and contains the craters of Reykjanes, the Hekla and other volcanoes of Southern Iceland. The second line runs from south to north and contains the Mývatn and Vatnajökull volcanoes. Hot springs and sulphur mines occupy the same lines, which are also taken by mountain ranges and submarine reefs. Earthquakes run in the same directions.

Eruptions are not so frequent as in the south of Europe. Hekla breaks out at intervals of seventy to eighty years, other volcanoes even less frequently.

Hekla, "The Cloak" (from its shape), the most famous of Icelandic volcanoes, is thirty-two miles inland from the nearest point of the coast, and situated west of Torfajökull. Its height is 5,108 feet. It is a longitudinally shaped mountain running south-west to north-east, piled up of lava blocks, pumice and ashes, with snow-filled craters standing in a row on top; it is an intermediate form between Vesuvius and a crater chain. Parallel with it run other mountain ridges of palagonite, breccia and tufa (1,000 feet to 1,500 feet) studded with craters. The Norwegian mineralogist, A. Helland, counted fourteen craters in a direct line near Hekla north-east to south-west, each with a lava stream of its own. Vast fields of lava extend round Hekla in every direction.

Of Hekla's eruptions eighteen are historically known, without reckoning three or four eruptions from craters in its neighbourhood.

The first known eruption of Hekla took place in 1104, the last in 1875. One of the most violent was the sixth eruption, July 13th, A.D. 1300. "The mountain was riven asunder lengthways, and out of this yawning chasm rushed forth columns of fire and streams of lava which ran nearly to the coast, 32 miles away, leaving here and there in the hollows on its course lakes of liquid fire. The crater vomited red-hot lava blocks to an unprecedented height. They cooled suddenly in the air and burst asunder with a thundering crash. . . . A strong south-easter carried the huge clouds of sand and ashes as far as 180 miles from the volcano so that they lay thick on the ground all that distance. The eruption lasted on unbroken for nearly a year. On December 28th, such masses of sand and ashes were thrown up that, at a distance of 225 miles, high hills and downs were formed by them and a violent earthquake laid waste the part of the district spared by the earlier eruption."

The ashes reached the north of Iceland. The air was darkened. Famine and loss of life followed, and houses were shattered by earthquakes.

The tenth eruption, July 25th, 1510, was so violent that huge blocks of lava were thrown out of the crater as far as Skálholt, 25 miles distant, and men were killed there by them. In May, 1554, at the time of the eleventh eruption, people were obliged to live in tents for the greater part of the summer on account of frequent earthquakes. The thirteenth eruption took place from January to March, 1579. Loud reports were heard for twelve successive days in the northmost parts of Iceland, and eighteen columns of fire were seen to rise simultaneously from the mountain. The ashes covered about one-half of the island. In the fifteenth eruption which began May 8th, 1636, thirteen craters broke out. The sixteenth eruption, in 1693, may be compared to that in 1300, and lasted February to August. "The earthquake was felt on the high seas, and endangered ships. Clouds of ashes changed day into pitch dark night, but glowing lava streams lit up the darkness with a red glare. Ashes were borne to Norway. The fall of ashes and downpour of rain lasted all the time till Easter. The cattle saved from instantaneous death, having to eat the singed grass under the ashes, suffered from a scorbutic disease, and lost their teeth or perished."

The eighteenth eruption commenced September 2nd, 1845, and continued for seven months. Halley says the flames were seen in Orkney. The ashes were carried over to the Orkneys and the column of smoke ascending from the crater was found by the mathematician Gunnlögsen to reach a height of 14,000 feet. The lava stream was 80 feet in depth and covered 8 to 9 square miles. It moved on, scooping up hills of sand and earth in its way, the red-hot liquid breaking forth now and then from under the cooled surface with violent crashes. The lava ejected is computed at 14,400 cubic feet.

The peninsula of Reykjanes is volcanic throughout, containing no less than 300 volcanoes with about 700 craters. The ranges of volcanic peaks, some of which rise to 2,000 feet, run in the same direction as the Hekla range. They are mostly extinct; six of them have broken out in historical times. A number of volcanic springs and chasms cleft by earthquakes are also found in the peninsula.

Eldeyjar (Fire Isles) or Fuglasker, a cluster of volcanic

rocks, situate 10 to 12 miles off the south-west point of Reykjanes. Nine eruptions, the earliest in 1211, are known to have taken place in the bottom of the sea near these islets. In 1783, during the Skaptá eruption, an island called Nýey (New Isle), about 10 to 16 square miles, appeared near the Eldeyjar, about 150 miles distant from the seat of the eruption. This island was taken possession of by the Danes. The next year it had disappeared. The Geirfuglasker (or Skerrie of the Great Auk), one of these islands, was reported, in 1884, to have sunk into the sea.

Eldborg (Fire burgh, the fortress of fire) is a crater 179 feet high, and 636 feet in diameter, in the middle of a flat plain, from which a lava tract, now called Borgarhraun, issued. It is the first crater mentioned in history in a state of eruption (Landnama, about A.D. 900). From afar it looks like an old feudal castle rising in the midst of the plain, with battlements, alone and isolated. It rises gently till within about 80 feet of the summit, when it shapes itself into a steep and precipitous wall of black, glazed lava, crowned with lofty battlements.

Katla or *Kötlugjá,* in the eastern part of Mýrdalsjökull, is a volcanic chasm covered with ice between the eruptions. It has burst thirteen times, with prodigious inundations from 894 to 1860. These "glacier leaps" have carried down masses of pulverized lava and alluvial detritus, filling up fjords and bays, altering the coastline and causing the land to encroach upon the sea. The first eruption of Katla (894) laid waste two districts. Ruins of the farms, destroyed that year, were found at the beginning of the seventeenth century. During its third eruption, in 1245, glacier slips overran Sólheimasandur. The layers of ashes were half a foot thick. In 1311, fifth eruption, fifty-one homesteads were destroyed, and a whole district laid waste. In 1625, eighth eruption, ashes fell in Norway, inundations with icefloes, earthquakes and columns of fire, lightnings lit the darkness of ashes. Pasture land was two feet deep covered with pumice. 1660, ninth eruption. Such was the quantity of stones and detritus borne down with the glacier-slide that a dry beach was formed, where formerly people fished in a depth of 120 feet. The coastline was pushed over 6,000 feet out into the sea. The ice-blocks swept a church away, and it sailed out to sea in the midst of them. 1721, tenth eruption. The ice-blocks of the glacier-slip were grounded in a depth of 400 to 500 feet, 13 to 14 miles out at sea; a grassy

ridge of land was swept away and in its place was left a polished slab of rock 6,750 square fathoms. The ashes fell so thick that at farms 115 miles distant from the crater, light was obscured so as to make the reading of print impossible. 1755, eleventh eruption. Rocks of the size of a house were embedded in ice-blocks carried to sea. Fire and water issued from three craters, accompanied with such terrific explosions, that people thought the country was being blown up. A hail of burning stones and balls of fire fell. In the night everything seemed on fire and the air was filled with a sulphurous smell; fifty farms were destroyed. The south part of the country was covered with a layer of ashes half to four feet thick. The Sólheima-glacier seemed to rise and sink violently. It sometimes seemed to be raised double its height from the ground.

Eruptions of a magnitude unparalleled on earth in historic times took place from a chain of 100 craters, 20 miles long, about the valley of Varmárdalur, near the sources of the Skaptá, to the north-east of Myrdalsjökull. The lava covered an area of 220 square miles and the volume of lava ejected is estimated by Lyell, in his *Principles of Geology*, to be equal to that of Mont Blanc. Thoroddsen puts it at 15 million cubic metres. The eruption lasted from June, 1783, to January, 1784. The greatest length of the lava stream, which passes down the channel of the Skaptá and reaches Hnausar in Medalland, is 47 miles, greatest breadth 15 miles, the length of the second lava stream in the channel of Hverfisfljót is over 40 miles, breadth 9 to 10 miles. In places it fills valleys and chasms of a depth up to 600 feet, yet its average depth here is only 20 to 30 feet. It is said that 37 farms were destroyed and 400 people lost their shelter. Famine and scorbutic diseases raged, and animals died in great numbers; 9,336 persons perished, about one-fifth of the population. The loss of horses is reported to have been 28,013, or 77 per cent. of all horses in Iceland, that of cattle 11,461, or 53 per cent., and that of sheep 190,488, or 82 per cent. The mass of matter ejected is computed at 50,000 millions of cubic yards.

Along the borders of Vatnajökull volcanic eruptions have often taken place. Its greatest volcano is Öraefajökull, which has broken out three or four times with formidable glacier slips. In the middle of the fourteenth century—the annals disagree as to the date—the ice covering the top of

the mountain rushed down in a violent torrent towards the sea, bearing along with it so much of stones, sand and detritus that a sheet of water having a depth of 180 feet was changed into a dry sandy beach. Five fertile districts were totally laid waste. Forty farms and two churches were swept away out to sea with all that was in them in a few hours. Pumice and ashes were carried into the north and west of Iceland 200 to 300 miles.

Its third or fourth eruption took place 1727, August 3rd, to 1728, May 25th, from five to six rifts in the glacier. The people had to camp out and walked about with tubs on their heads, as the air was filled with burning embers.

The lava desert, Odáðahraun, which is 1,700 square miles in extent, has many craters, mostly unexplored, except those of the *Dyngjufjöll*, the largest volcano in Iceland, 4,500 feet in height, east of the centre of the desert. These mountains enclose a circular valley or crater Askja (the basket), 25 square miles in area, a vast crater, 17 miles inner, 24 outer circumference, a mountain built up by innumerable lava flows and upheavals to 3,800 feet, or 2,300 feet above Odáðahraun. Its bottom is 3,100 to 3,500 feet above sea level inclining eastward (1° 26′) towards the mouth of the valley which opens into the surrounding lava tracts. Many active craters stud its bottom. An eruption took place here in 1875. In the south-east corner of this valley is a dip 800 feet deep in the ground, in which there is a round hot lake having a temperature of 72° F., and 4,000 feet in diameter when it was found in 1876. In 1884 it filled the whole dip and had become 10,000 feet long, but its temperature was only 56° F.

On March 29th, 1875, an eruption covered the whole of eastern Iceland with pumice and ashes. The crater from which the eruption proceeded is situated on the north-east edge of the dip, 300 feet in diameter, 150 feet in depth. Its exterior is a slope filled with ashes, its interior is round and perpendicular. It is now a mud cauldron, which no longer emits steam, but goes on boiling, in quaint colours, depositing sulphur. Craters in this lake emit steam with thundering noises, sounding in the far distance like the simultaneous letting off steam from innumerable pipes. Thoroddsen says: "Nature is here grander and more overawing than in any place in Iceland I have seen. He who once has stood on the edge of this earthdip will never forget the sight."

The steam pressure seems to have converted all the lava in this eruption into pumice and ashes.

North-east of the Odáðahraun is a mountain range in which the volcano Dyngja, which has given name to the whole groups of mountains, is situated. It is 3,600 feet high. The original crater is 1,500 to 1,600 feet in diameter and half filled with lava from which twelve columns of lava rise. In the midst of these is a crater 4,500 feet in diameter, 600 to 700 feet deep, with a terrific and startling look down. North-west of this Dyngja is another volcano also called Dyngja (Northern Dyngja).

North of the Dyngjufjöll in the lava tract Myvatns-öraefi (the Desert of the Mosquito Lake) an eruption took place in 1875, near Sveinagjá. A rift nine miles long appeared, along which some crater cones, 70 feet to 108 feet high, shot up and spread 10,000 cubic feet of lava over the plain.

No spot in Iceland is so crowded with craters, lava formations, solfataras and hot springs as the neighbourhood of Lake Mývatn, especially on its eastern shore. It is so thickly studded with extinct volcanoes and remainders of prehistoric convulsions as to look more like a landscape in the moon than anything else.

Eruptions took place there with short intervals in the years 1724–30. The chief volcanoes are Krafla and Leirhnúkur (Clay Peak) in a palagonite ridge running from south to north. Of these eruptions those from Leirhnúkur have been the most formidable.

In an eruption of Krafla, May 17th, 1724, great masses of volcanic matter issued from an explosive crater called "hell" (Víti), 1,030 feet in diameter. No lava was ejected. The fame of this volcano is derived from its crater of boiling clay, now a round lake with green cold water. Close to the crater are sulphur and mud springs.

ERUPTIONS IN ICELAND.

Eldborg.	Off Reykjanes.	Yxurrárhraun.	Trölladyngja.	Hekla.	Raudukambar.	Eyjafjallajökull.	Katla.	Varmárdalur.	Skaptárjökull.
c. 900	1211 1226 1231 1238 1240 1422 1583 1783 1830 1879	1000	1151 1188 1340 1360 1389	1114 1157 1206 1222 1294 1300 1341 1389 1436 1510 1557 1578 1597 1619 1636 1693 1728 1754 1766 1845 1878	1343	1612 1821	894 934 1311 1416 1580 1625 1660 1721 1823 1860	1823	1389 1753

Grimsvötn districts.	Skiedarárjökull.	Ördfajökull.	Vatnajökull.	Kverkfjöll.	Dyngjufjöll (Askja).	Dyngja.	Jrölladyngja.	Sveinagjá.
1598 1685 1716	1681 1725 1727 1774 1784	1341 1362 1598	1225? 1332 1477 1638 1862	1867 1873	1875			1875

Krafla.	Lurhnúkur.	Hrossdalur.	Bjarnarflag.	Dalfjall.	Place unknown.
1724	1725 1727 1728 1729	1728	1725 1728	1728	

Iceland has another and greater claim to your interest. It is, as William Morris said, the Greece of the North. It produced in the twelfth and thirteenth centuries a literature unparalleled after Rome before the golden age of England and France, in character drawing, in passionate dramatic power, in severe, noble simplicity, in grim humour. All the characters of the Sagas live and move to-day. Every hill and headland and valley in the island is full of their presence. The Icelander of to-day knows them by heart. It is as if every Englishman, from pauper to king, knew Shakespeare's historical plays and could retell them more or less in his or her own words. It has kept the national pride alive through evil times. It has preserved the language almost untouched by time and foreign intercourse.

Nowhere is the contrast between man and his surroundings so glaring as in Iceland. Buried in snow and darkness, deprived of every comfort, living on rancid butter and dried fish, drinking sour whey and milk, dressed like his servants, seeking in a little boat his food, yet a cultured mind, possessing an intimate knowledge, not only of the history of his own country but of Greece and Rome, a poet fond of throwing off satires, intellectually and morally the equal of his European guest, considering himself your equal and refusing to be ordered about by a rich Englishman, owner of several square miles of land and hundreds of sheep, with a pedigree going farther back than that of his visitor, a jack-of-all-trades, a blacksmith in his smithy, boat-builder and carpenter, an artist in filigree work, a carver in wood, an eager reader of books. He has universal education up to the degree to which it is useful for a man. There are no schools in Iceland, yet every child at twelve can read, according to the parish statistics. In no country in Europe are so many books printed and sold, in proportion to the population. A population equal to that of Hampstead, 76,000, has twelve printing presses, the earliest one being established as far back as 1530. About one hundred books annually, fourteen newspapers and eight periodicals are produced to satisfy the literary needs of this little nation.

Yet this literary people still live in a pastoral and Homeric civilization which is a modern lesson of the healthfulness of human life lived in close contact with the free, wild life of nature, such as would have delighted the heart of Rousseau or Thoreau. As a proof that this life is healthy I give the example of a clergyman who died four years ago, 113 years

old, having managed to live all his days healthy and happy on £30 a year, the average stipend in the Icelandic church. The sheep yield food and clothing. Their wool is pulled off in spring, carded, spun, woven in handlooms and worn undyed. You make shoes of their skin and spoons of the horns. Every opportunity is seized for the telling of stories and reciting of poems. Only the milk ewes are kept at home in summer, to be milked, the rest of the sheep are gathered in from the mountains in autumn, notice being given at church from the pulpit. These autumn gatherings, with people sitting on the walls of the stone enclosure telling stories, are quite Homeric. The winter evenings with each member of the family busy at work in the same room, the men shaving the wool off sheepskins on their knees, making ropes and nets of hair, the women using spindle and distaff, embroidering, etc., afford a still better opportunity for stories and poems.

There are even wandering minstrels, who gain their livelihood by reciting prose or poetry which they know by heart at various farmhouses till they exhaust their stock.

To conclude with a few statistics, the annual trade of Iceland is worth close on one million pounds, export and import together. The principal articles of export are salted cod-fish, wool, mutton, eiderdown. A large and increasing part of the trade is with Great Britain. In the fifteenth century all the foreign trade of Iceland was in English hands. Henry VIII. negotiated with Denmark, in 1518 and 1535, for its transfer to England, and its economic and strategic importance to Great Britain has been set forth as late as 1835 in the *Quarterly Review*, by Sir George Mackenzie and Sir William Hooker, who held that Iceland ought to be a British possession. It has been declared by experts that the fishing grounds of Iceland are richer than those of Newfoundland, and, though they are much nearer Great Britain, their annual yield is not more than £2,000,000, because they are not worked as they ought to be.

For close on 400 years Iceland was an aristocratic republic, ruled by the great families of the early settlers, among whom was a Norse queen of Dublin. A fourteen days' open-air Parliament of all Iceland met annually in June at Thingvellir and the Speaker of the Law (lög-sögu-man) used to recite from memory the whole of the unwritten, elaborate code of laws of the country to the assembly. In

1262–64 Iceland was united to Norway, and in 1380 with Norway to Denmark. The Danish rule ruined the island, economically, but since the granting of self-government and the re-establishment of the old Parliament, in 1874, at Reykjavik great progress has been made. The revenue of Iceland is now six times as large as 28 years ago, and it is probably the only country with *no* debt, but with 1,000,000 crowns of savings in its exchequer. Yet more has been expended on the ways and roads of the island since 1874 than in all the centuries down to that date. The Icelanders are keen politicians. Women have been in possession of the municipal vote earlier in Iceland than in any other country, and they do not change their names when they marry. The Parliament (*althing*) is composed of an Upper House of 12 members and a Lower House of 24. A minister for Iceland is to reside at Reykjavik in place of the Governor, who at present is the highest official in the island, and form the link between the Crown at Copenhagen and Parliament at Reykjavik.

The Icelanders are a religious and God-fearing people, but very averse to parsons' rule. It is a habit to criticize the sermon when you shake hands with the clergyman after the service. There is little crime. It is lawful for a farmer to steal his neighbour's hay when his cattle refuse to eat his own hay, and for this stolen food the cattle are said invariably to find an excellent appetite.

Discussion.

The Chairman.—Before we go further, I am sure I may thank the author, in all your names, for the wonderfully interesting and detailed paper that he has read to us. I do not know what Dr. Stefansson may call the island in his own country; but he seems rather to disapprove of the name "Iceland." What do you call it, Dr. Stefansson?

Dr. Stefansson.—The same.

The Chairman.—It is a *multum in parvo* both from a geological and I think we may say a literal point of view.

[*The lantern slides were then exhibited on the screen.*]

The SECRETARY (Professor E. HULL, LL.D., F.R.S.).—Mr. Chairman, I am sure we have had a very great treat to-night, and I regret that we have not a larger number of members present. We particularly miss Dr. Walker, who has, as you know, a good deal of knowledge of Iceland. I fully expected he would have been here to take part in the discussion. However, no doubt, for some good reason, he is not present. I wrote to the Right Hon. James Bryce, M.P., to ask him to be present this evening as he has visited and written on Iceland, and has personal acquaintance with Dr. Stefansson. He replied thanking me for the invitation and the copy of Dr. Stefansson's paper which I had sent, and stating his intention to be present unless unavoidably prevented by his engagements at the House of Commons.

The only observations I will venture to offer upon this very interesting and elaborate communication will be in reference to the volcanic phenomena of Iceland. As the author has stated, the whole island is composed of volcanic rocks in great variety. Whether there exists a core of older rocks round which these volcanic lavas have accumulated we cannot tell; but we are safe in concluding that the eruptions of matter of which the island is composed are in the main of very recent geological origin; in fact, of Middle Tertiary Age; commencing with the Miocene period and continuing with interruptions down to the present day. As Lyell has observed* with regard to those of historic times, there is the most complete chronological record of the successive eruptions coming down from the ninth century of our era; and which go to show that since the twelfth century there has never been an interval of more than forty years without either an eruption or a great earthquake. So intense is the volcanic energy in the island that some of the eruptions of Hekla have lasted six years without cessation. Earthquakes have often shaken the whole island at once, causing great changes in the interior, such as the sinking down of hills, the rending of mountains, the desertion by rivers of their channels, and the formation of new lakes. New islands have been sometimes thrown up near the coast, while others have disappeared. The volcanoes of Iceland may be considered as safety-valves to the

* *Principles of Geology*, 11th edit., vol. ii, p. 48.

region in which lie the British Isles. There is reason, in fact, to suppose, that a great rift passes through the earth's crust connecting Iceland with Ætna and ranging through the volcanic districts of the west of Scotland, the north of Ireland, and the Auvergne region of central France. A few years ago it was observed, that the earthquake which passed through Devonshire and the coast of Ireland, was simultaneous with an eruption of Ætna, and (if my memory is correct) was felt in the Auvergne region. It is satisfactory to know that the great eruptions of lava which during Miocene times desolated the region lying along the coast of Scotland and that of Ireland have cooled down and ceased to flow, while the volcanic activity only survives at the extremities of the great rift, Iceland in the north and Sicily in the south.

While thanking Dr. Stefansson for his communication, I may mention that he is the author of an elaborate work on Iceland, *The Saga Steds of Iceland*, beautifully illustrated, and that he is at present engaged on a dictionary of the English and Icelandic languages. [Applause.]

Mr. MARTIN ROUSE.—I should like to say a few words. I remember reading in a standard work on geology, that at the close of the eighteenth or the beginning of the nineteenth century, ashes were carried from Iceland to Scotland and overspread Sutherland with fine dust which overlaid the fields, and that year was known as "the year of the ashes."

I should like to say that I agree with Professor Hull in what he said just now as to Iceland being a safety-valve for us.

I think it is very beautiful to see how the Icelanders have clung to their native island in the midst of their evil times. I think their love of the Holy Bible and their knowledge of Christ which has spread amongst them, have had much to do with the maintenance of their patriotism, side by side with their literary culture and the remembrance of the songs and compositions of their native authors. [Hear, hear.]

A MEMBER.—Would the lecturer kindly tell us to what race the Icelanders belong, where they come from, and what their language is?

Dr. STEFANSSON.—The Icelanders are Norwegians; but it is an interesting fact that many of the early settlers came from the British Isles.

Mr. MARTIN ROUSE.—Were they Danes and Anglo-Saxons that were not allowed to land?

Dr. STEFANSSON.—No, they had already settled in the island But no doubt they brought many companions from the British Isles and no doubt the Irish and Gaelic people came with them to Iceland.

A MEMBER.—Is their language Norwegian?

Dr. STEFANSSON.—Yes. The Irish seem to have been in Iceland before the Northmen came. I am afraid it is not by our own free will that we act as a safety-valve to others! [Laughter.]

Mr. MARTIN ROUSE.—I have read that there is evidence that the Culdee preachers travelled as far as Iceland to preach the Gospel to the inhabitants.

Dr. STEFANSSON.—That is so.

The CHAIRMAN.—I am sure you will let me express in all your names our thanks to Dr. Stefansson for kindly giving us this lecture and information to-day. [Applause.]

The Meeting then adjourned.