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THE SCOTTISH GEOGRAPHICAL MAGAZINE.

ROCKALL.

By MILLER CHRISTY, F.L.S.

I. INTRODUCTORY REMARKS.

To the average person, the existence of the locality known as Rockall is almost, or wholly, unknown. It might form part of the British Isles, or be situated in Central Asia, so far as the ordinary man is able to tell. Even among those who pay special regard to the study of geography, comparatively few could at once, and off-hand, state its position, nature, and points of interest, if asked to do so. Many gazetteers and geography books, even of the better class, wholly ignore its existence. Yet Rockall is as remarkable as any locality of its kind in the whole world. It is, indeed, in some respects, unique; while its nature, its position, and its surroundings are of quite a romantic kind; its interest, from a scientific point of view, is considerable; and, as the most westerly outpost of the British Isles, it deserves something more than the very meagre share of attention it has hitherto received.

I have for some years taken a deep interest in this strange and (from some points of view) fascinating locality, and have collected all the information relating to it that I have been able to lay hands upon. The result may be seen in the following remarks, which are intended as a convenient summary of all that is known to date concerning Rockall, and as a guide which shall indicate to any who may be fortunate enough to visit it in future the chief points in connection with it which require further investigation.

The literature relating to Rockall is widely scattered throughout miscellaneous narratives of travel, the publications of learned societies, nautical magazines, and country newspapers; but the contributions of all writers of importance are cited in the following article.

It will be convenient to summarise the information to be given under the following additional sub-headings :—

- II. Its Nature, Position, etc.
- III. Its History.
- IV. Its Points of Scientific Interest; and
- V. Concluding Remarks.

II. ITS NATURE, POSITION, ETC.

Rockall is a lonely and isolated rock, of conical or pyramidal shape, rising sheer out of the stormy waters of the Atlantic, to the north-west of the British Isles. Speaking in general terms, its position is about 160 geographical miles west-half-south from St. Kilda in the Outer Hebrides; about 290 miles almost due west from Ru Ruag, on the coast of Ross-shire (the nearest point of the Scottish mainland, with the exception of Ardnamurchan Point, much farther south, which is a few miles nearer); about 260 miles north-west from the Bloody Foreland (the nearest point on the mainland of Ireland, though Erris Head, farther south in the County Mayo, is only a few miles more distant); and about 470 miles south-east-by-south from the nearest part of Iceland. Its exact position, as laid down by the latest *Admiralty Sailing Directions* (1896, p. 739), is lat. $57^{\circ} 36' N.$, long. $13^{\circ} 42' W.$ The rock at its base has a circumference of about 250 feet, and its summit (which is more or less pointed, and is always whitened by the dung of sea-birds) rises to a height of about 70 feet above the surface of the water. Its western face is absolutely perpendicular, and all its other sides are almost precipitous, the north-east face being the least steep. Around its base (which has a circumference of about 100 yards) are several ledges, over which the waves usually dash furiously. Several writers familiar with the rock have spoken of it as resembling, in shape and appearance, a large haycock floating on the surface of the sea. The rock is said to be composed (mainly, at least) of a coarse dark-coloured granite, and to be highly magnetic—statements which will be considered hereafter. There is neither soil upon it nor sandy beach around it, the depth of water close up to it being from twenty to thirty fathoms. It cannot, therefore, strictly be spoken of otherwise than as a “rock”—not as an “island,” nor even as an “islet.” Owing to the steepness of its sides, and to the prevalence of the Atlantic swell, which surges almost incessantly round it, a landing upon the rock can only be effected in the very finest and calmest weather—perhaps on not more than two or three days in the course of a summer. There can be no doubt that in winter the waves often dash over its summit. The captains of vessels passing the rock at a distance, or when first sighting it—even those familiar with it—almost invariably take it at first for a vessel in full sail, owing to its height, its steep sides, and its whitened summit.

About a cable and a half north-east-by-north from the main rock is a small reef, exposed at half-tide, and known as Haselwood rock. The water between them has a depth of thirty fathoms.

Another similar rock, known as the Helen's reef (from the fact that

the wreck upon it of a vessel of that name first made its existence known, as mentioned hereafter), lies about one mile and three-quarters east-by-south from the main rock. Its top, though usually submerged, is said to have been seen in the trough of the sea at low water springs. Usually its position is shown by breakers; but at high water (the rise being about six feet), and in fine weather, it causes the sea to break only at long intervals. Inasmuch as it is of small size, is usually submerged, and is steep-to (that is to say, the water is deep right alongside it), it is (as may be imagined) extremely dangerous to passing vessels, especially to those whose commanders do not know of its existence.

Several observers have recorded the existence, around the base of the rock, of other reefs, upon which in bad weather the sea breaks heavily; but these are not shown on the charts, and their existence is doubtful.

Captain Basil Hall is responsible for the description of Rockall as the most diminutive speck of dry land, in the shape of island, islet, or rock rising out of the sea, to be found anywhere in the world at so great a distance from any mainland. "The smallest point of a pencil," he says,¹ "could scarcely give it a place on any map which should not exaggerate its proportions to the rest of the islands in that stormy ocean." This description, published nearly seventy years ago, appears to be literally correct. The nearest approach to Rockall in this respect is probably afforded by the St. Paul's Rocks, which lie in the Atlantic almost on the equator, and midway between Africa and South America;² but these rocks, though farther from any mainland, are much larger than Rockall.

Nevertheless, isolated and remote as Rockall is, it marks the highest point of an extensive "bank" or submarine plateau, a large part of which would be exposed as dry land were the sea-bottom elevated no more than one hundred fathoms, and which, in all probability, has been actually thus exposed within (geologically speaking) comparatively recent times.³ "Rockall bank" (as it is called) extends from north-west to south-east, that portion lying within the 200-fathom contour-line being about 150 miles long and 50 miles broad. About half of this area lies within a 100-fathom contour-line (Rockall itself lying rather to the north-east of the centre). Within a radius of two miles and a half from the rock, the depths range from forty to seventy fathoms.

Although Rockall forms (as has been said) part of the British Islands, this must be understood in a political, rather than in a physiological, sense. The rock is, of course, far nearer to these islands than to any other land; but between the two lies a deep sea giving soundings from 1000 up to 1600 fathoms—depths which can only be regarded as

¹ *Fragments of Voyages and Travels* (London, 3 vols., post 8vo), vol. iii., p. 179. There are several later editions.

² The St. Paul's Rocks (which must not be confounded with St. Paul's Island, in the Indian Ocean) lie about one degree north of the Equator, in long. 29° 15' W., and about 540 miles from the coast of Brazil. They are of irregular outline, and appear from a distance like one island, though in reality separated from one another by deep narrow channels. They occupy together an area measuring about 470 yards by 230 yards. The rock of which they are composed is probably eruptive.

³ See *post*, p. 411.

truly oceanic, and which indicate that the period when a dry-land communication existed between Rockall and the British Isles (if, indeed, it ever did so) must have been immensely remote, even as the geologist reckons time. The significance of this fact becomes more obvious when it is remembered that all the other islands adjacent to Britain, with the single exception of the Færo group, lie well within the 100-fathom contour-line surrounding these islands, even including St. Kilda, which, though as much as 130 miles from any portion of the mainland of Britain, is the nearest point of land to Rockall. That is to say, that, to enable a man to wade out through the sea to Rockall, he would need to have legs *sixteen* times as long as to reach any other island adjacent to Britain, except Færo. This remarkable oceanic abyss which exists between Rockall and Britain is a spur or projection of the still deeper area lying in the middle of the Atlantic, which runs up from the south-west. It is true that, farther north, Rockall and the north of Scotland are connected by an area of shallower water, which includes also the Færoes; but even there the depths are considerable, approaching 1000 fathoms. Rockall and its bank are, therefore, excluded from the "British Atlantic Slope District," as defined by the British Association's Committee on British Marine Zoological Areas. That "District" is described¹ as lying to the west and north of Britain, between the 100-fathom contour-line and the 1000-fathom line, at which depth the "abysmal floor of the ocean" is said to commence. Indeed, as the depths between Rockall and Iceland are comparatively small—only 500 or 600 fathoms—and as Iceland belongs, physiographically, rather to the American than the European area, it may even be said that, from this point of view, Rockall forms the easternmost outlier of North America, rather than the westernmost outlier of Europe, in spite of its much greater nearness to the latter.

There seems good reason for believing (from evidence afforded by certain old charts to be mentioned hereafter) that, as lately as the beginning or middle of the seventeenth century, Haselwood rock, Helen's reef, and a sandbank of small extent surrounding the main rock, were exposed as dry land—at any rate, during low water; but this point may be more fitly discussed in Section IV.

Of modern charts showing Rockall and its bank, the best obtainable is Messrs. Imray's *Chart of the Seas North-west of the British Isles*.² The excellent English Admiralty Chart of the locality, published in 1861,³ is now out of print and no longer obtainable. Rockall is, however, of course, shown, though in less detail, on various Admiralty charts of the North Atlantic Ocean. Among the best of them is the chart of *The Banks and Soundings to the Westward of the British Isles, surveyed by Captain A. E. T. Vidal, 1830 and 1831* (published September 13, 1833). The two accompanying charts show, according to the latest information, the outline of Rockall Bank and the general position of Rockall in reference

¹ *Report of Manchester Meeting, 1887*, p. 95.

² London (James Imray and Son), corrected to 1898.

³ *North Atlantic: Rockall and Soundings in its Vicinity, 1831* (No. 2870). Published 25th Nov. 1861 and corrected to Dec. 1863.

to the nearest British and Irish coasts, with the remarkable depths between those coasts and it.

A roughly-executed woodcut view of the rock (probably the first ever published) appeared in 1812 in Purdy's *Memoir of a Chart of the Atlantic*.¹ The drawing from which it was prepared was obtained when the rock was visited by Captain Basil Hall on July 8th, 1810, as mentioned hereafter. The same drawing doubtless also served for the more pleasing copper-plate vignette which appeared in 1831 on the title-page of the third volume of Hall's *Fragments of Voyages and Travel*. Other views (probably derived from the same source) appeared on the margin of the general chart of the British islands in several of the earlier editions of Stieler's *Hand-Atlas* (Gotha), and in Messrs. Harvie-Brown and Buckley's *Vertebrate Fauna of the Outer Hebrides*.² On the Admiralty chart of Rockall alluded to above, no fewer than eight excellent views of the rock, taken from as many different points, are given. All the above-mentioned representations of the rock have, however, now been superseded by the recent publication³ of nine views of it, reproduced directly from photographs taken from different points during an expedition made to the rock in 1896, as mentioned hereafter. These are accompanied by three large coloured lithographed views of the rock, most effectively reproduced from drawings made on the same occasion by the Rev. W. Spotswood Green. I am indebted to the same gentleman for the kind loan of the drawing from which has been reproduced the very excellent representation of the rock which faces page 393; for the photographic views of the rock reproduced (for the first time) on the plate facing page 404; and for the sketch-plan of the rock appearing on page 408. The sketches were made, and the photographs taken, by the reverend gentleman, assisted by his son, Mr. C. Green, during the recent expedition in which he took part. No attempt has, I believe, ever before been made to represent the ground-plan of the rock.

Allusion has already been made to the resemblance between the rock, when seen from a distance, and a ship in full sail. This resemblance is so close as to deceive all but those navigators who know of, and are actually on the look-out for, the rock. On this point, Captain Basil Hall, R.N., says:—

"... the top being covered with a coating as white as snow, from having been for ages the resting-place of myriads of sea-fowl, it is constantly mistaken for a vessel under all sail. We were deceived by it several times during the same cruise [in H.M.S. *Endymion*], even after we had been put on our guard and knew its place well. I remember boarding three ships in one day, each of which, in reckoning the number of vessels in sight, had counted Rockall as one, without detecting their mistake till I pointed their glasses to the spot."

The same writer elsewhere⁵ recounts the circumstances of one of the cases in which he himself was misled:—

¹ London, demy 8vo, p. 219.

² Edinburgh, 4to, 1888, plate facing p. lxxxvii.

³ *Trans. Roy. Irish Acad.*, vol. xxxi. (1897), part 3.

⁴ *Fragments of Voyages and Travel* (1831), vol. iii., p. 180.

⁵ *Op. cit.*, vol. iii., p. 178

"In a fine autumnal morning, . . . a sail was reported on the lee-beam. We bore up instantly, but no one could make out what the chase was, nor which way she was standing—at least, no two of the knowing ones could be found to agree upon these matters. . . . The general opinion was that it must be a brig with very white sails aloft, while those below were quite dark—as if the royals were made of cotton and the courses of tarpaulin—a strange anomaly in seamanship, it is true, but still the best theory we could form to explain the appearances. A short time served to dispel these fancies; for we discovered, on running close to our mysterious vessel, that we had been actually chasing a rock—not a ship of oak and iron, but a solid block of granite, growing, as it were, out of the sea. . . ."

Since Hall wrote thus, nearly every seaman who has described his sighting of Rockall has alluded to its extraordinary resemblance to a ship in full sail. It will suffice to quote the remarks of two such writers.

Surgeon Alexander Fisher, R.N., writing on May 24th, 1819, says:¹—

"We had a distant view to-day of that remarkable insulated rock called Rockal. It looked, at the distance we were from it (viz., between four and five leagues), exactly like a ship under sail: it was reported, indeed, by the first person who saw it, to be a strange vessel. Its resemblance, not only in form, but also its colour, tended to make the deception more complete; for it appeared to be perfectly white, a hue most probably produced by the excrement of birds. Our distance from it, indeed, was too great to enable us to speak with certainty on this head; but, from the number of birds we saw in its neighbourhood, and its insular situation, we may fairly conclude that it is well inhabited by the feathered race, for here they are perfectly secure from the attacks of their greatest enemy—man."

Captain Andresen, a Færoese smack-owner, says² that, amongst a number of boats with sails set, it is "almost impossible to distinguish the rock from the boats [when] at a distance."

Allusion has already been made to the dangerous nature of the two reefs lying near Rockall, especially Helen's reef, which lies a mile and three-quarters from the main rock. These reefs have never been either lighted, belled, or buoyed. Inquiry at the Trinity House has elicited the information that Rockall has never been deemed to lie within the jurisdiction of the General Lighting Authorities. Yet there can be no doubt that the rock and the adjacent reefs, though not in the most direct and most frequented line of cross-Atlantic traffic, have, in the past, not only imperilled many vessels, but have actually caused the loss of some. The wreck of a French or Spanish ship at Rockall in 1686 will be alluded to hereafter; while the loss, in 1824, of the Dundee brigantine *Helen* and sixteen lives, has already been mentioned. The latest *Admiralty Sailing Directions* describe the reefs as "very dangerous," and fishing captains who have fished upon the bank have strongly indorsed this statement. Captain Thomas Blanche, of Burravoe, Shetland, who has had much experience of fishing on the bank, says:³—

¹ *Journal of a Voyage of Discovery into the Arctic Regions, in His Majesty's Ships "Hekla" and "Griper," in the years 1819 and 1820*, 4th ed. (London, demy 8vo, 1821), p. 14.

² See *Proc. Roy. Phys. Soc. Edin.*, vol. xiii. (1895), p. 71.

³ See Harvie-Brown and Buckley's *Vertebrate Fauna of the Outer Hebrides*, pp. 89-90.

"While there [in 1869], vessels were daily passing. My opinion is that many a vessel is cast away on that rock. One day, a vessel under full stunsails was heading east or north-east, appearing to keep clear of the rock, but not of the reef. When she was two miles off the reef, the sea broke over it. She then hauled to the west and stood clear of the reef. They either did not know about the reef or did not know it was so far off the rock. Had this affair occurred in the night-time, or in thick weather, probably they would have been lost."

On this question, no one can speak with greater authority than Captain William Barron, of the Trinity House at Hull, who, in his younger days, when engaged in the Davis Strait whale-fishery, passed the rock on many occasions. He says:¹—

"If the truth was known, I daresay that many a stout vessel has been lost upon the rock and reef adjacent, and not a vestige or a soul left to tell the tale. It is so situated that vessels, in former days, bound east from America and driven by a continuance of southerly winds, have frequently seen it in the day-time, but there is nothing to denote its situation by night. Thus it was a source of great anxiety for masters of sailing ships in those days. . . . Such places near our coast are so little known; yet rocks, shoals, and small islands, thousands of miles away and seldom seen, are accurately marked on the charts and known to navigators; but this small spot, so near to us, has been the dread of mariners for many years back in misty weather. At the same time, it is almost an impossibility to erect a lighthouse to warn seamen of its proximity. A landing cannot be obtained, perhaps, not more than once in twelve months, on account of the ever-rolling swell of the Atlantic."

A Captain Osborn, of Workington, has stated² that "on his passage from Quebec, in 1806, it was with the utmost difficulty he escaped getting amongst the breakers" round Helen's reef.

On the whole, it seems not improbable that some, at least, of the mysterious disappearances of well-found vessels which are reported annually from the Atlantic are connected with these dangerous hidden reefs.

III. ITS HISTORY.³

It is highly remarkable, considering the large number of fabulous, or "phantom," islands with which tradition half filled the North Atlantic between the fifteenth and the seventeenth centuries, that Rockall, the only *real* island at all corresponding in general position to these fabulous islands, should not be shown with any certainty upon the marine charts before the beginning of the seventeenth century; yet such appears to be the case. Although I may claim a more than ordinary familiarity with the cartography of the North Atlantic from the very earliest times, I am quite unable to point with confidence to a representation of Rockall on any chart earlier than the year 1600. Nevertheless,

¹ *Old Whaling Days* (Hull, crown 8vo, 1895), p. 179.

² See Purdy's *Memoir of a Chart of the Atlantic*, 5th ed. (1825), p. 242.

³ In preparing this section, much assistance has been obtained from information collected by Prof. T. Rupert Jones, F.R.S. (See *Trans. Roy. Irish Acad.*, vol. xiii., pp. 89-97.)

there are earlier charts upon which islands are shown, one of which *may* be intended to represent it. Thus, nearly all the earliest charts—those of the thirteenth and fourteenth centuries—showing the eastern portion of the North Atlantic, show, to the north and north-west of Britain, a number of islands (mostly nameless, of a conventional character, and incapable of identification), one of which *may* have had its origin in Rockall. This is the more probable inasmuch as the existence of the rock cannot have been unknown to the Bristol merchants who, from very early times, carried on a trade in dried fish with Iceland. Again, on the celebrated globe of Martin Behaim, made in 1492 at Nuremberg, and still preserved there, a nameless island is represented near where Rockall actually lies. On the map of the British Isles in the Latin *Ptolemy* of 1525 (Strassburg) an island called “Danchuli” is represented in lat. 57° N.,¹ and (as far as can be estimated) in about long. 10° W. from Greenwich. This, considering the means of calculating latitude and longitude at the time, might be thought to represent Rockall; but it seems certain that, in this case, the island now called St. Kilda is intended. On a Portuguese chart of about the year 1550, preserved in the Bibliothèque Nationale, Paris,² there appears, just to the north of Ireland, a fair-sized island, against which there is a name apparently similar to “Rochol,” but the ink was unfortunately smeared by the draughtsman before it was dry. Otherwise, I have not been able to discover any indication of Rockall upon any chart earlier than the year 1600.

Immediately after the commencement of the seventeenth century, however, Rockall commenced to appear under the names of “Rocol,” “Rochol,” or “Rokol,” upon most (though not all) good charts showing the North Atlantic. The very earliest representation of it I have observed is on the map by Gulielmus Jansonius (Blaeu), entitled *Nova Totius Terrarum Orbis Geographica ac Hydrographica Tabula*, and published in 1606,³ whereon it appears as “Rocol” in lat. $57^{\circ} 30'$ and about long. $11^{\circ} 20'$ W. from Greenwich.

In 1618, it appeared as “Rochol” on the chart of the Atlantic drawn on parchment at Lisbon by Domingo Sanches, and now preserved in the Bibliothèque Nationale in Paris.⁴

In 1636, it appeared as “Rokol” on the maps of the World and of the North Polar Regions, in Hexham’s edition of Mercator’s *Atlas* (Amsterdam, 2 parts, 1636-38).

About the same time, it was represented, with a smaller rock a little to the north-east of it, on a globe now preserved in the Bibliothèque Nationale in Paris.⁵

In 1650, it was shown as “Rocol” in Janson’s *Atlas* (Amsterdam).

On Johannes van Keulen’s *Kaart van de Noord [Atlantic] Oceaen*

¹ On the chart, the lat. is shown as 55° , but all the latitudes are placed about 2° too low.

² *Cartes*, Inv. 1021.

³ The only copy I have seen is in the British Museum (*Maps* 920 (262).)

⁴ *Cartes*, C. 19,251.

⁵ *Cartes*, Inv. 5.

(Amsterdam, 1692), it appears as "Rocol," with a smaller rock on each side of it.

In 1693, it appeared as quite a large island, with a small rock on each side of it, on a map in *Le Neptune François* (Paris).

Of its appearance on charts of the eighteenth and nineteenth centuries, it is needless to speak here.

The earliest written reference to Rockall with which I am acquainted is a statement by Martin Martin, published in 1698,¹ to the effect that, in 1686, a company of Frenchmen and Spaniards lost their ship at "Rockol" and escaped in their boat to St. Kilda, the inhabitants of which island (adds Martin) then called it "Rokabarra."

Although the existence of Rockall was perfectly well known during the eighteenth century, little or no interest appears to have been taken in it, and I am unable to refer to any statements that it was ever landed upon by any one at this period. The only description of it I am able to cite as belonging to this century is the following by Captain W. Coats, who, as a captain in the service of the Hudson's Bay Company, passed the rock on many occasions during his voyages between England and the entrance to Hudson's Strait between the years 1727 and 1751. He says: ²—

"Rokel is a solitary island in latitude 57° 38' N.; longitude west from Hoy Head, 10° 30' W. Rokele is a pyramid not unlike the Stack, but higher and bigger, and white from the same cause; and I had no ground at eighty fathom on the NW. side at a distance of a mile and a half; and I made east 10° N.-erly from this rock to Hoy heade."

Since the beginning of the present century, more attention has been devoted to the rock, which has been frequently visited and several times landed upon. The earliest landing effected was (so far as I can ascertain) on July 8th, 1810, when the master (Mr. T. Harvey) and some of the officers of His Majesty's frigate *Endymion* (then commanded by the Hon. Thomas Bladen Capel), with two boats' crews, effected a landing, of which Captain Basil Hall, R.N., F.R.S. (then lieutenant), who took part, has given an excellent and well-known account. He says: ³—

"As we had nothing better on our hands, it was resolved to make an exploring expedition to visit this little islet. Two boats were accordingly manned for the purpose; and, while the ship stood down to leeward of it, the artists prepared their sketch-books and the geologists their hammers for a grand scientific field-day.

¹ *A Late Voyage to St. Kilda* (London, 8vo), p. 15.

² *The Geography of Hudson's Bay*, by Capt. W. Coats, edited by John Barrow (London, Hakluyt Society, demy 8vo, 1852), p. 7.

³ *Fragments of Voyages and Travel*, vol. iii., p. 180. The date mentioned above is that given (*Memoir of a Chart of the Atlantic*, London, 8vo, 1812, p. 219) by John Purdy, to whom the scientific results of the landing appear to have been communicated. From Hall's own narrative, one would infer that the landing was effected about the middle of September 1811; but, as he wrote twenty years later, he may well have been in error as to the date. The position of the rock, as ascertained (for the first time) on this occasion, was lat. 57° 39' 32" N., long. 13° 31' 16" W. (mean), which was erroneous by about 3' as regards latitude, and 11' as regards longitude.

"When we left the ship, the sea appeared so unusually smooth that we anticipated no difficulty in landing; but, on reaching the spot, we found a swell rising and falling many feet, which made it an exceedingly troublesome matter to accomplish our purpose. One side of the rock was perpendicular, and as smooth as a wall. The others, though steep and slippery, were sufficiently varied in their surface to admit of our crawling up when once out of the boat. . . . In time, however, we all got up, hammers, sketch-books, and chronometers inclusive.

"As it was considered a point of some moment to determine not only the position, but the size of the rock by actual observations made upon it, all hands were set busily to work—some to chip off specimens, others to measure the girth by means of a cord; while one of the boats was sent to make soundings in those directions where the bottom could be reached.

" . . . I forget exactly at what hour a slight trace of haze first came across the field of view. This soon thickened into a fog, which felt like a drizzle, and put some awkward apprehensions into our heads. It was immediately decided to get into the boats and return to the *Endymion*, for by this time we had finished all our real work, and were only amusing ourselves by scrambling about the rock.

"The swell had silently increased in the interval to such a height that the operation of returning to the boats was rendered twice as difficult as that of disembarking, and, what was a great deal worse, occupied twice as much time. It required the greater part of half an hour to tumble our whole party back again. This proceeding, difficult at any season I should suppose, was now reduced to a sort of somerset or flying leap; for the adventurer whose turn it was to spring had to dash off the rock towards the boat, trusting more to the chance of being caught by his companions than to any skill of his own."

The return to the ship was attended by an adventure, which Captain Hall relates at some length. On pushing off from the rock it was found that the ship, though visible but a minute before, was hidden by the on-coming fog, and no one in either boat was certain of her position. After some delay, it was suggested that, from the top of the rock, the ship's masts might be visible above the fog, and a man was accordingly landed to report, but nothing was to be seen except a still thicker bank of fog, which was fast approaching and soon rendered it impossible to see ten yards in any direction. The situation was now somewhat serious; for the wind was rising, the sea was becoming rough and broken, and there was not a drop of water or a scrap of food in either boat, while (as those in the boats had recently observed) such fogs often lasted for days together. In these circumstances, it was decided to remain near the rock, as the only fixed point for which the ship could make. After anxious waiting, a slight opening of the fog allowed the "shivering scout" on the top of the rock to catch sight of the ship. Having spent a quarter of an hour in getting their lookout man on board, the boats started as fast as possible towards the ship; but they had hardly gone a quarter of a mile before both ship and rock were lost sight of in the fog, and matters became worse than ever. Fortunately, however, they were able again to recover the rock, beside which they lay, waiting for the fog once more to clear, discussing meanwhile the possibility of dragging the smaller boat to the top of the rock and there

forming a shelter. At last, just as night was falling, the fog suddenly lifted, and the ship was sighted standing away from the rock, the position of which she had lost. It was almost dark when those in the boats got safely on board her once more, after an absence of many hours. The fog had prevented them hearing the guns which had been repeatedly fired from the ship.

In October 1812, some soundings were made by H.M. ships *Leonidas* and *Brisk* in the immediate vicinity of the rock,¹ but I am unable to say whether or not a landing was effected.

On May 24th, 1819, the rock was sighted by the English Arctic Expedition to Lancaster Sound, under Parry, when outward bound. Surgeon Alexander Fisher, R.N., who accompanied the expedition, has described² the rock as it was seen in passing.

On April 19th, 1824, the brigantine *Helen* (Thomas Erskine, master) of Dundee, bound for Quebec and Montreal with a general cargo, struck twice on the sunken rock now called Helen's reef (which was then for the first time made known, at least to modern seamen), the weather being hazy at the time, and the captain deeming himself six miles distant from Rockall. The crew and passengers continued at the pumps for thirteen hours, but were ultimately obliged to discontinue their efforts, being overcome with fatigue, and the leak having gained upon them so much that the water had risen within three feet of the hold-beams. In launching the long-boat, she was unfortunately smashed against the vessel's side by a tremendous sea. The crew, twelve in number, with one passenger, then embarked in two other boats, apparently (according to the narrative) deserting the remaining passengers, sixteen in number (of whom seven were women and six children). Soon after the boats left the vessel, she sank, all those on board being drowned; but the crew was ultimately picked up at sea by the barque *Flora* (Captain Baker), bound from Danzig to Liverpool, and safely landed on the island of Tiree, in the Hebrides.³

I have not been able to discover any record to the effect that, after 1810, the rock was again landed upon before 1831, when the depth of the sea around it and off the north-west coasts of Britain was explored by Captain A. T. E. Vidal, R.N., in H.M.S. *Pike*. So far as I can discover, no account of this landing has ever been published.

In or about the year 1856, a landing upon the rock was effected by a party from Colonel Gascoigne's yacht *Myra*. One of those who landed on this occasion says:⁴—

“The yacht lay-to at some distance off the rock. The yacht party went off in boats, and landed on part of the rock which slopes down to the water's edge. After shooting a quantity of cormorants, kittywakes, and sea-gulls, they returned.”

¹ See note on Admiralty Chart, No. 2870.

² See *ante*, p. 398.

³ See Purdy's *Memoir on a Chart of the Atlantic*, 5th ed. (1825), p. 241.

⁴ *Proc. Roy. Phys. Soc. Edin.*, vol. xiii. (1895), p. 68.

In 1860, according to Wallich,¹ some further soundings were taken in the vicinity of the rock by the present Admiral Sir Leopold M'Clintock, then commanding H.M.S. *Bulldog*.

In August 1861, considerable attention was directed to the rock by the discovery (to be more fully noticed hereafter) that the shallow waters covering the bank surrounding the rock abounded in fish, especially cod. It was probably on account of this discovery that, in the following summer (1862), the rock was visited and extensive soundings taken around it by Captain R. Hoskyn in H.M.S. *Porcupine*, in the course of a cruise extending from June to August, partly undertaken in order to carry out the soundings necessary before the laying of an effective Atlantic cable. The following is an extract from Captain Hoskyn's report on the cruise :²—

"August 14.—At noon, observed Rockall, with several fishing vessels near it. There being too much sea to do anything in the vicinity of the rocks, hove-to for the night."

"August 15.—. . . The weather having become fine, with only a moderate swell, sent a boat with a party to land on the rock ; but the sea broke so heavily round it that the officer in command thought it would be imprudent for them to do so. One of the party, Mr. Johns, the boatswain, succeeded in getting a footing, but not at the part where the summit is accessible."

Captain G. H. Inskip, R.N., who, though he did not land himself, was the officer in charge of the boat in question, has recently given³ the following account of the landing :—

"The weather was fine and the sea smooth, but even with these advantages it was difficult work, and required care and patience to watch for an opportunity to pull the boat's bow in close enough to allow the man to jump out on to the rock. It would not have been prudent to have put the boat alongside, on account of the wash ; but, by keeping her stem-on, and the men ready to back off in a moment, we managed it. In the same way, we got the man off again. By giving any one who has landed a line, and his jumping into the water, no time need be lost in re-embarking."

It appears⁴ that the man who landed broke off, by means of the sounding-lead, which was thrown to him for the purpose, four or five pieces of rock, which he obtained all in one place, and that, wrapping them in his neckerchief, he threw them into the boat.

During the summer of 1869, the *Porcupine* again visited the rock. The late Dr. J. Gwyn Jeffreys, F.R.S., who was on board, says :⁵—

"While we lay-to within a quarter of a mile from Rockall on the evening of Saturday, the 3rd of July, fishing parties were formed and continued their sport until midnight. The rock was inhabited by a multitude of sea-fowl, and a large

¹ *North Atlantic Sea-bed* (London, 4to, 1862).

² See *Nautical Magazine for 1862* (London, demy 8vo), pp. 564-565.

³ In a letter addressed to Mr. R. M. Barrington in 1884.

⁴ From another letter written to Professor T. Rupert Jones.

⁵ *Proc. Roy. Soc.*, vol. xviii. (1870), p. 422 ; also *Nature*, vol. i. (1870), p. 136.

(1)

(2)

ROCKALL.

(1) From the SE. by S. (2) From the SW. by W.
(From Photographs by the Rev. W. Spotswood Green and
Mr. Charles Green, 1896.)

gannet, perched on the highest pinnacle, looked like a sentinel, or the president of the feathered republic."

Since 1861, Rockall Bank has been annually visited by fishing-boats from various British and Irish ports (as will be more fully noticed hereafter), and members of their crews have from time to time been able to effect a landing upon the rock itself. Thus, in the summer of 1887, the crews of two such vessels, the *Dolphin* and the *Gauntlet*, among them being Captain Johannes Hansen, of Thorshavn, landed. Naturally, however, the result of the observations of such men has been of small scientific interest.

In March 1892, there was published¹ anonymously an account of a visit to Rockall, which appeared, at first sight, to possess extraordinary interest, as it gave a detailed account of the avi-fauna of the rock, and declared that the Little Auk (*Mergulus alle*) bred upon it. Inquiry by eminent Scottish naturalists quickly showed,² however, that the article, though published in perfect good faith, was a hoax, being altogether imaginative and spurious, and that the writer had never visited the rock, as he claimed to have done.

The only expedition ever despatched for the sole purpose of examining Rockall from the scientific point of view was made in the summer of 1896. It was undertaken on the initiative of the present writer, though organised by Mr. R. M. Barrington, F.L.S., the Rev. W. Spotswood Green, M.A., of the Fisheries Board, Dublin, and several other gentlemen, acting as a committee of the Royal Irish Academy, which learned body voted a sum of money for the purpose. A sum of equal amount was contributed jointly by Messrs. R. M. Barrington and J. A. Harvie-Brown. The fine steamer *Granuaile*, belonging to the Congested Districts Board, having been chartered by the Academy on liberal terms, and the necessary trawls, dredges, sounding apparatus, rope-ladders, and scientific apparatus having been placed on board, a departure was made from Killybegs, Co. Donegal, on June 3rd. The party on board consisted, in addition to the three gentlemen named above, of Messrs. R. Lloyd Praeger, W. de Vismes Kane, H. L. Jamieson, and C. Green. Rockall was sighted at daybreak on the 5th, but the state of the weather prevented any attempt at landing. The vessel lay-to to await an improvement; the trawl was shot as often as an opportunity offered itself; and sketches were made and photographs taken of the rock; but, the coal-supply having given out, a return to Killybegs became necessary, and that place was reached on the evening of the 8th.

On the evening of the 13th (the reports from Tory Island, Sumburgh Head, and other points, indicating a probability of finer weather), the party started from Killybegs on a second attempt to reach Rockall; but, when the rock was again sighted, at daybreak on the 15th, the weather was as unfavourable as before, and landing was a total impossibility. Whilst again awaiting an improvement, the time was spent in trawling

¹ See *Chambers's Journal*, vol. ix., pp. 161-163.

² See *Ann. Scot. Nat. Hist.*, 1892, p. 197; also *Proc. Roy. Phys. Soc. Edin.*, vol. xiii. (1895), p. 68.

and dredging at spots where the nature of the sea-bottom permitted, and some very interesting results were obtained. The weather, however, did not improve, and, the coal-supply having once more become exhausted, a return became necessary. After spending a few hours at St. Kilda, the ship entered the harbour of Londonderry on the 18th. Although the party thus failed to effect a landing upon either of the two attempts made so to do, the expedition obtained much interesting information. Excellent sketches and photographs of the rock (already alluded to) were obtained, and these are reproduced to accompany the interesting report of the expedition written by the Rev. W. Spotswood Green.¹ Much information relating to the ornithology of Rockall, and a good deal bearing upon the zoology of Rockall Bank, was obtained, as will be noticed hereafter. The failure to land is chiefly to be regretted from the point of view of the geologist and the student of terrestrial magnetism.

IV. ITS POINTS OF SCIENTIFIC INTEREST.

Having now discussed the nature, position, and history of Rockall, it remains to inquire what points of scientific interest it presents.

There is no point in connection with Rockall which is of greater general and practical importance than its meteorology. Standing, as the rock does, far out in the Atlantic, to the westward of Britain, its value to the inhabitants of Europe, and especially to the inhabitants of the British Isles, as a meteorological observing-station might be enormous. If it were possible to establish such a station upon the rock, connected by a cable with the mainland, our meteorologists would receive earlier and more definite information of the approach of cyclonic disturbances from the westward, and the science of weather-forecasting would be immensely simplified. No less high an authority than Dr. R. H. Scott, F.R.S., the Secretary of the Meteorological Office, has declared² that—

“If a station on Rockall could possibly be established and maintained, its value to weather-telegraphy would be incalculable ; but [he adds] there are one or two fearful *ifs* :—

- “(1) *If* the place can be built upon ;
- “(2) *If* the communication by wire can be kept up ; and
- “(3) *If* any one will live there.”

The idea of establishing an observing-station on Rockall is by no means new. The advantages of doing this, if possible, are so great and so obvious that the matter long since received the careful consideration of the British Meteorological Authorities, whose attention has recently been again directed to it. The labour and expense, however, of landing workmen and supplies ; of excavating foundations for and erecting, first storehouses and workshops, and subsequently a lighthouse or observatory ; of making the soundings necessary before a cable could be laid ; of laying the cable itself (without which the station would be valueless) ; and of keeping up the supplies of the station when established—the

¹ *Trans. Roy. Irish Acad.*, vol. xxxi. (1897), pp. 39-47.

² *Ibid.* p. 64.

labour and expense of all this would be so great that no attempt has yet been made to utilise the natural advantages of Rockall as an observing-station.

Considering the very limited area presented by the rock, its remoteness from any other land, and the fact that in winter the waves undoubtedly far over-top its summit, it may well be doubted whether the establishment, actually upon the rock itself, of a lighthouse or observing-station is, or ever will be, a practical possibility. On the whole, it seems that a far cheaper, simpler, and more feasible plan would be to moor a lightship on some portion of Rockall Bank, adjacent to the rock. This would serve both as a warning to seamen and as an observatory. In either case, however, the cost of laying a submarine telephone or telegraph cable would have to be met, and this would be great, perhaps £35,000 or £40,000. It is true that, some years since, the managing-director of the Telegraph Construction and Maintenance Company expressed¹ grave doubts as to the feasibility of mooring a vessel permanently in such deep water, or (if this were done) of getting any one to live in it on account of the incessant pitching and tossing, or of maintaining efficient cable communication with the mainland. It seems certain, however, that this gentleman unduly exaggerated the difficulties to be contended with; for Admiral Sir William Wharton, the present Hydrographer to the Admiralty, has expressed² his belief in the possibility of both mooring a ship under such circumstances and of living in it without unreasonable discomfort afterwards; while the problem of maintaining cable-communication with lightships has been successfully solved in various places round our coasts. The only real difficulty in establishing an observatory and lightship on Rockall Bank appears to be the great cost of the very long cable that would be necessary. Without doubt, however, the time will come when this difficulty will be successfully overcome.

On the Admiralty chart of Rockall before alluded to,³ it is stated that, "The compass-variations very near the rock were such as to induce the supposition that it is highly magnetic." On this point, any one fortunate enough hereafter to be able to land upon the rock might easily make definite observations. The chief cause of local magnetic attraction in such rocks or islets is the presence of the magnetite of basalt, but this is not as yet known to form part of Rockall.

The geology of Rockall is a matter of much scientific interest, upon which any visitor hereafter landing upon the rock might easily throw very important light. At present, almost nothing sufficiently full and definite to be deemed satisfactory is known as to the nature of the rock of which Rockall is composed; yet the desirability of procuring definite information upon this point will be obvious to any one possessing even a smattering of geological knowledge. Rockall presents an almost unique exposure of rock, indicating the nature of the rock-formations

¹ *Journ. Roy. United Service Instit.*, vol. xxxvi. (1892), p. 506.

² *Ibid.*, pp. 511-512.

³ See *ante*, p. 396.

constituting the ocean-bed, at a point intermediate between several more or less distant lands, namely, Greenland, Iceland, the Færoes, the Hebrides, and Ireland. A knowledge of the geographical structure of

SKETCH-PLAN OF ROCKALL.

(From a Drawing by the Rev. W. Spotswood Green, 1896.)

When Basil Hall visited the rock in 1810, small fragments were broken off and brought away. These were distributed to various museums, but none of them seems to have been carefully examined at the time. Again, in 1862, when the rock was visited by Captain Hoskyn, in H.M.S. *Porcupine*, specimens were again procured, as already mentioned, and brought home. Some of these were distributed among the leading Irish Museums (including those of Queen's College, Galway, the Geological Survey of Ireland, and the Belfast Museum), while others were preserved by Lieutenant (now Staff-Captain) G. H. Inskip. One of these specimens was examined soon after by the late Mr. David Forbes,¹ whose conclusions (which do not seem to have been very reliable) attracted but little attention.

The first systematic attempt to decide the rock-structure of Rockall seems to have been made on the initiative of Mr. J. A. Harvie-Brown, who sent to Prof. F. M. Heddle, F.R.S.E., for examination, a fragment of rock obtained by Mr. John Cordeaux, of Great Cotes, Ulceby, Lincolnshire, from a Grimsby smacksman, John Barr by name (since dead), who

Rockall would, therefore, be of great interest as affording a sure indication of the nature of the rocks forming the bed of the North Atlantic, and as showing whether those rocks were similar to, or dissimilar from, those of the most nearly adjacent lands referred to above. Except from such rare exposures of rock as that afforded by Rockall, it is practically impossible to obtain satisfactory evidence of the nature of the rocks forming the beds of oceans, and of their relationship (if any) to the rocks of which the lands surrounding those oceans are composed.

¹ See *Proc. Roy. Soc.*, vol. xviii. (1870), pp. 491-492.

some years ago collected it on the bank whilst line-fishing for cod, a piece of branching coral growing upon it having become affixed to his lines. As, however, it appeared probable¹ that this fragment never formed part of, and differed in structure from, Rockall itself, its nature need not be considered here in detail.

Recently, a fragment broken from the rock when Basil Hall landed in 1810, and two fragments procured when the *Porcupine* visited it in 1862, have been carefully examined by Prof. J. W. Judd, F.R.S., who, having also examined the photographs and sketches of the rock procured by the Rev. W. S. Green, during the recent (1896) expedition, has reported² as follows:—

“Rockall is . . . [apparently] a portion of a great intrusive sheet of igneous rock, now lying in an inclined position upon stratified masses, which are seen on the south-west side of the rock. The igneous mass shows very marked rectangular jointing, and is thus described by Mr. Green in a note which he has obligingly communicated to me:—

“‘The east face seemed like a great slab of gray granitoid rock (and I was within twenty yards of it), with rectangular joints broken off at the north, so as to show the square edge of another slab, and this was in turn broken off, showing the face of a third. . . .’³ [All this granitoid mass] rests, as you suggest, on a rock, showing a kind of bedding or jointing, dipping about east, and at an angle of 30° or so.’

“So far as I know, no specimen has ever been obtained from this underlying mass, on the west or south-west of the rock, and it is impossible to say whether it consists of sedimentary materials, of stratified tuffs, or of some fissile igneous rock. The general relations of the rocks of Rockall strikingly resemble those of the Shiant Isles, north of Skye, where we have the ends of a great inclined sheet of dolerite, resting on stratified clays, into which the igneous rock was intruded.

“Most observers have agreed that the material composing the greater part of Rockall resembles a ‘granite,’ and all three of the specimens I have examined bear out this description. . . . The material appears to me to be undoubtedly a massive rock, and one of a new and very interesting type.

“The structure of the rock is, to the eye, perfectly granitic; the essential minerals in it being three: colourless quartz, clouded felspar (albite), and black crystals of a ferro-magnesian silicate—soda-augite (aegirine and acmite). The peculiarities of the two latter minerals are not obvious from a megascopic inspection of the rock, and hence it might easily pass as an ordinary granite, or rather as a hornblende granite, using the last term in the original sense in which it was applied by its author, Gustav Rose.

“When the three specimens of the rock are compared, they are found to exhibit a remarkably close agreement in the essential features of their mineralogical constitution, and in their structure the differences are not greater than is often found in different portions of the same rock-mass. . . . All three of the specimens are somewhat drusy (‘miarolitic’) in character—in this respect resembling many others rocks of the class of granite porphyries. The drusy cavities are stained with brown decomposition products, indicating, probably, the former presence of secondary minerals within them.

¹ See Harvie-Brown in *Proc. Roy. Phys. Soc. Edin.*, vol. xiii., pp. 65-66.

² *Trans. Roy. Irish Acad.*, vol. xxxi., pp. 49-51.

³ This is shown, to some extent, by the sketch-plan on p. 408.

"Detailed microscopical study and analysis of the material of Rockall shows that it is as unique in mineralogical and chemical constitution as it is isolated in position. The rock consists of three minerals, a soda-augite (aegirine and aemite), quartz, and albite; accessory minerals, other than magnetite and apatite, appearing to be very rare in it."

After discussing in great detail the nature of the three specimens, their relation each to the other, and to other known rocks of similar character, Prof. Hull reaches the conclusion that Rockall is composed of a rock sufficiently different in character from all other known rocks to be deserving of a distinctive name. He, therefore, proposes to call it "Rockallite," and concludes¹ as follows:—

"Rockallite may be defined as a rock having the structure of the 'granite-porphyrries' (*hypidiomorphic, granular, and microlitic*), but belonging to the extreme variety of the soda-bearing acid rocks. It is an aegirine-quartz-albite rock, intermediate in structure and composition, between the soda-granites on the one hand, and the groludites on the other, and presenting points of analogy with some sodacratophyres. Among lavas or effusive rocks, rockallite is probably represented by some of the quartz-pantellerites.

"With respect to the age and relations of the rock forming the singular isolated mass of Rockall, the materials for arriving at a judgment must be admitted to be very small. If the rock over which the igneous mass appears to have been thrust could be examined, and especially if it were shown to be a stratified rock with fossils, the evidence thus afforded would be of great value. At present, however, we have nothing but general analogies to guide us. The nearest resemblance to rockallite is found, as we have seen, among the Post-Silurian dykes in the Christiania district, so admirably investigated by Prof. Brögger; and it may be that in Rockall we have a similar intrusive mass of the same period, that has escaped destruction by denudation. But it must be remembered that among the Tertiary Rocks of the Western Isles of Scotland, in St. Kilda (which is the nearest land to Rockall), in Skye, Ardnamurchan, Mull, and Arran, we have granites and granite-porphyrries containing soda-augites and soda-amphiboles. Some rocks approaching very closely in composition to rockallite are known to me among the Tertiary eruptives, and it is therefore by no means impossible that the rockallite belongs to the same recent period."

Prof. Grenville A. J. Cole, F.G.S., has carefully examined and reported upon² the rock specimens procured upon Rockall Bank by fishermen who have brought them up entangled, by means of attached corals, among their lines, and by the recent (1896) expedition, whilst dredging. He says:—

"The recent expedition . . . has revealed a great prevalence of basalt in the neighbourhood of Rockall itself. The specimens gathered by Mr. Cordeaux, from English fishermen who have visited the bank, consist, moreover, very largely of basalt.

"It is highly probable that the relics of a basaltic plateau lie submerged at Rockall bank, and that the material of the rock itself represents another phase of local igneous activity. The bank would find a fitting place in the petrographic

¹ *Loc. cit.*, pp. 57-58.

² *Trans. Roy. Irish Acad.*, vol. xxxi., pp. 58-62.

province which includes Iceland, the Faeroes, the Inner Hebrides, and the north-eastern counties of Ireland; and we must not forget that the whole Cainozoic era has elapsed since vulcanicity was established in this province. Hence there has been ample time for the volcanoes of the Rockall area to be denuded, and for their slopes and lava-fields to be strewn with boulders from further rounding and decay; and, similarly, the metamorphic region on the east has been carried down, with its taluses and stream-courses and moraines, to form the floor of the deep water between Rockall bank and Ireland."

It appears, therefore, that much might be ascertained as to the geology of Rockall by any person landing upon the rock who would take the pains to procure proper specimens, and to make exact and systematic observations. No skilled geological observer has ever yet landed upon Rockall, and all that we know of its structure has been gathered from the appearance of tiny fragments of rock broken off haphazard by persons possessing no geological knowledge whatever.

Prof. Hull has declared¹ that, in the Jurassic Period,

"the Atlantic area was probably distributed into ridges or islands, with intervening sea-lochs and basins, of which Rockall, Bus (or Busse),² and several of the little islets and sunken rocks in that portion of the Atlantic, between latitude 10° and 30° W., may be modern indications."

That very extensive subsidence has taken place in the Rockall region, within comparatively recent geologic times, has been shown³ conclusively by Sir Archibald Geikie in his paper on "The Tertiary Basalt-Plateaux of North-Western Europe."

Allusion has already been made to the probability that, as lately as a couple or three centuries ago, not only was the main rock surrounded by an exposed sandbank of small extent, but the adjacent reefs had a greater exposure than now. On a large globe of about the middle of the seventeenth century, preserved in the Bibliothèque Nationale, Paris,⁴ a dotted line, which may be taken to indicate an exposed sandbank, surrounds the rock; and (as will be mentioned hereafter) many dead and bleached shells, belonging to species accustomed to live in quite shallow water, have recently been dredged up from portions of the bank, now covered by nearly 100 fathoms of water. On the same globe, and also on an interesting manuscript chart of about the year 1640, by Le Sieur Tassin, French Geographer Royal,⁵ "Rookol" has represented adjacent to it a smaller rock, which (though in both cases incorrectly placed) probably represents either Haselwood rock or Helen's reef. Yet the latter, at least, was (as will be remembered) considered to be unknown when the *Helen* was wrecked upon it in 1824.

¹ *Contributions to the Physical History of the British Isles* (London, roy. 8vo, 1882), p. 101.

² The present writer has been able elsewhere to show that the legendary "Land of Busse," here referred to, never had any real existence (see *Danish Arctic Expeditions, 1605-1620*, book i., pp. 164-202; Hakluyt Society, 1897).

³ *Quart. Journ. Geol. Soc.*, vol. lii. (1896), pp. 399-405.

⁴ *Cartes*, Inv. 5.

⁵ Reproduced in *Scient. Proc. Roy. Dub. Soc.*, vol. ii. n.s. (1879), pp. 173-176; also in *Journ. Geol. Soc. Irel.*, vol. v. (1880), pp. 128-131.

To the zoologist, Rockall presents many points of considerable interest. Every one is aware of the special interest which pertains to a study of the fauna of oceanic islands. Rockall may certainly be so designated, and it is the only island adjacent to Britain to which the term may be correctly applied; but, unfortunately, in its case, the area is so extremely small that one could not reasonably expect to find a distinctive fauna, such as often characterises isolated oceanic islands, or even a distinctive species of any kind, existing upon it. Nevertheless, it may be truly said that the fauna of Rockall possesses an interest far above that of any other similar rock or islet lying close to our shores.

The captain of a Grimsby smack has asserted¹ that "Grey Seals" (? *Halicherus gryphus*) at times frequent the ledges around the base of the rock. It is not likely that any mammalian animals, other than seals, are ever to be found there.

Ornithologists, until recently, awaited with keen anticipation any precise information concerning the avi-fauna of Rockall. It had long been known that the rock is frequented, at least during summer, by large numbers of sea-birds, and that its summit is (as already stated) permanently whitened by their droppings. Any species which might casually resort to the rock during autumn or winter would prove of small interest, but the case was different with those species found upon the rock during summer, for the probability was that they, or some of them, bred upon it. Even if these proved to be species breeding more or less commonly upon the nearest Scottish or Irish coasts, the extension of their known breeding-area to any such locality as Rockall would be a matter of interest; but there remained also the possibility that the rock might form a breeding haunt of other species, not known to breed in Britain, such as the Greater Shearwater (*Puffinus gravis*), Bruennich's Guillemot (*Uria bruennichi*), or the Little Auk (*Mergulus alle*)—indeed, the writer of the bogus article referred to above² stated explicitly that the last-named species did breed upon the rock. It is little wonder, therefore, that ornithologists were keenly anxious to know what species, if any, bred upon the rock, notwithstanding the fact that, owing to its extremely small superficial area, the number, both of species and individuals, frequenting it for breeding purposes must necessarily have been small.

The first definite information was obtained through the industry of Mr. Harvie-Brown. That gentleman has published³ the statement of Captain Johannes Hansen, of Thorshavn, who asserts that, when he landed upon the rock in 1887,⁴ "several" species of birds were breeding on it, and that he and his companions brought away as food "a boat-load of eggs." He only brought home, however, a single egg, which is now in Mr. Harvie-Brown's possession, and is apparently that of the Common Guillemot (*Uria troile*), though possibly that of Bruennich's Guillemot.

The recent expedition, though unable to effect a landing, obtained, nevertheless, a good deal of information concerning the avi-fauna of the

¹ *Proc. Roy. Phys. Soc. Edin.*, vol. xiii. (1895) p. 68.

² See *ante*, p. 405.

³ *Proc. Roy. Phys. Soc. Edin.*, vol. xiii. (1895), p. 69.

⁴ See *ante*, p. 405.

rock. In the report,¹ we are told that, in June 1896, the bird-population of the rock itself consisted, at a rough guess, of about 250 Guillemots, 50 Kittiwakes (immature), 30 Puffins, 10 Gannets (of which eight were immature), and (possibly) a few Razorbills. Over or near the Bank, fourteen other species of bird were seen in greater or less numbers, including several species of Gull, Tern, and Skua, the Fulmar (*Fulmarus glacialis*), the Manx Shearwater (*Puffinus anglorum*), and the Great Shearwater (*Puffinus gravis*). The last-named interesting species (of which the breeding-place is unknown, though it has a wide range of distribution over the Atlantic) was seen in numbers over the Bank, either singly or in small flocks, seldom in pairs, apparently feeding or resting, but certainly not breeding on the rock.

Of the birds actually seen upon the rock, the Guillemot was thought to be probably breeding; but this was not the case with any of the other species named. Most of the individuals were immature, and it seems probable that Rockall and its Bank form a great summer resort for many young non-breeding birds of the species named.

The information obtained by the recent expedition is more ample and more satisfying to ornithologists than to students of any other branch of science; but, for fuller particulars, the reader must be referred to Messrs. Harvie-Brown and Barrington's excellent paper cited above.

To the botanist, Rockall is of little or no interest. Some smacksmen informed Mr. Harvie-Brown and Mr. Cordeaux that they had observed scanty vegetation growing upon the rock, but none such was observed by the members of the recent expedition, and it seems very doubtful if any phænogamous plant could exist in such a locality. There may, however, be some kinds of lichen growing upon the rock; and, without doubt, there are seaweeds. Specimens of either should be obtained and brought home by any future visitor.

Turning now from the zoology of Rockall itself to that of the Bank surrounding it, one must take first of its fish-fauna—the only point of view from which the place can be said to present an aspect of direct commercial interest. The fishery on Rockall Bank has been prosecuted with more or less energy since the year 1861. It appears² that, in August of that year, a certain Captain Rhodes, master of a smack, when crossing Rockall Bank on his voyage home from Greenland, accidentally let down his lines. No sooner were they down, than several large cod were at once hooked. Down went the lines again, and more fish were at once hooked. This went on at such a rate that, “in an incredibly brief space of time, fourteen tons of large beautiful cod-fish were taken, valued at £10 per ton; and, having exhausted their salt and other stores, the delighted fishermen set sail for Westray in Orkney, where they astonished the natives with their marvellous narrative.” Two or three other vessels at once went out and met with similar success; but, the winter coming on, operations had to be suspended. Meanwhile, however, a company

¹ By Messrs. J. A. Harvie-Brown and R. M. Barrington (see *Trans. Roy. Irish Acad.*, vol. xxxi., pp. 66-75).

² See *Chambers's Journal*, vol. xviii. (1863), pp. 364-366.

was organised and preparations made for the following year's campaign. This by no means came up to all that was expected of it; and, since that time, the Rockall fishery has not been worked by any organised company, though regularly visited by fishing vessels from various English and Scottish ports. Grimsby and Greenock appear to be the ports from which these vessels now chiefly come. Some come from Færo and others from various ports in the Hebrides and on the western coast of Scotland. Few, if any, now go to Rockall from Peterhead or Fraserburgh.¹ As regards Hull, Captain Barron says:²—

“Several fishermen from Hull have fished on the banks around it [*i.e.* Rockall], and have obtained good catches of cod, which attain to a great size; but, owing to the wild state of the weather, that part of the sea for fishing is not often frequented.”

Any expedition properly equipped for carrying on dredging operations upon Rockall Bank would certainly be able to bring home material of much interest to students of marine zoology; but an ordinary yachtsman visiting Rockall would probably not be able to accomplish much in this direction. The first to dredge the bank was the late Dr. J. Gwyn Jeffreys, during the cruise of the *Porcupine* in 1869.³ In 1896, Mr. John Cordeaux presented to the British Museum (Natural History) and the Museum of the Royal College of Science, London, collections of corals and other marine organisms brought up attached to the lines of Grimsby fishermen when fishing on the bank.⁴ During the recent expedition (1896), a small amount of good dredging work was accomplished, and the results are dealt with by various writers in the *Report* on the expedition⁵ as follows:—The Mollusca, by Mr. A. R. Nichols, of the Science and Art Museum, Dublin; the Crustacea, by Messrs. W. T. Calman, B.Sc., and E. P. Wright, M.D.; the Chætopoda, by Prof. M'Intosh, F.R.S.; the Echinodermata, by Mr. W. Percy Sladen, F.L.S.; the Polyzoa, by Miss L. R. Thornley; the Hydrozoa, by Miss L. R. Thornley; the Actinozoa, by Prof. A. C. Haddon, D.Sc.; and the Spongida, by Prof. Robert von Lendenfeld.

The mollusca obtained were of sufficient interest to deserve special notice here. On the 15th June, the dredge was lowered at a spot fifteen miles south from the rock, where the water was 100 fathoms deep and the bottom consisted of fine sand.

“In a haul of about twenty minutes [says the Rev. W. Spotswood Green⁶], the water shoaled to 80 fathoms; and, when the trawl came up, we found in the bag a most unexpected assortment of shallow-water shells, evidently long since dead. Amongst these were several kinds of *Pecten*, *Venus casina*, *V. fasciata*, *Mytilus modiolus*, etc. How, under present conditions, such shells could be found living anywhere on the bank was difficult to understand. . . . There is, of course,

¹ J. A. Harvie-Brown in *Proc. Roy. Phys. Soc. Edin.*, vol. xiii. (1895), p. 72.

² *Old Whaling Days* (Hull, crown 8vo, 1895), p. 179.

³ *Proc. Roy. Soc.*, vol. xviii. (1870), p. 490.

⁴ See *Trans. Roy. Irish. Acad.*, vol. xxxi., p. 97.

⁵ *Ibid.*, pp. 76-83.

⁶ *Ibid.*, pp. 45-47.

the possibility that these shells may have come from the bottom of icebergs which had grounded in Greenland or Spitzbergen bays; but I doubt if, in times sufficiently recent, such bergs have visited the position occupied by Rockall. . . . The possibility of the shells having been brought as bait for the lines of the fishing-boats visiting the bank is, I think, disposed of by the mixed character of the deposit, some of the shells being unsuitable for such a purpose. It would be interesting to trace out the area occupied by these dead shells, . . . but the time at our disposal only gave us the chance of one dip into this deposit."

Mr. A. R. Nichols has been good enough to send me for examination one of the shells dredged on this occasion. It is perfectly white and in an exceedingly soft friable condition, having lost all trace of animal matter. The presence of these shallow-water shells, evidently long since dead, lends strong confirmation to the surmise, already advanced and supported by several facts cited, that Rockall and its bank have recently undergone considerable depression or erosion, or both. Doubtless, these shells lived upon the Bank when the water over it was much shallower than now, probably not more than 20 to 50 fathoms in depth, the latter being the greatest depth at which any of these species are commonly found living; and, as the depth increased, they doubtless died.

V. CONCLUDING REMARKS.

From the foregoing it will be gathered that, although much more is now known concerning this extraordinarily interesting speck of oceanic land than was known even a few years ago, much that is of interest still remains to be learned about it. It is, perhaps, improbable, after the failure of the recent expedition to effect a landing, that another properly equipped expedition will be undertaken on purpose; but there are surely plenty of British and American yachtsmen, owning stout sea-going steam yachts, who would be glad to have a definite and useful object for a short ten-days' cruise, accompanied by some scientific friend, during next summer. To any such, a trip to Rockall may be recommended. Any such expedition should not be undertaken earlier than the middle of May or later than the beginning of July, between which dates the birds frequenting the rock would be found breeding, and there would be a fair probability of meeting with fine weather. It is true that there would always be a possibility that the weather, at the time of the visit, might not permit of a landing being effected; but a few days' dredging on the bank would certainly afford results of much interest to students of marine zoology; and, even if nothing of scientific interest were accomplished, a cruise would have been enjoyed.

In compiling the foregoing remarks, I have (as stated) drawn upon and cited the writings of all who have recently treated of the subject. I have also to thank many of these gentlemen for kind assistance rendered to me personally or by correspondence. Among these, I have especially to thank the Rev. W. Spotswood Green (to whom I am indebted for the drawings and photographs from which the accompanying illustrations have been made), Prof. T. Rupert Jones, and Messrs. Barrington, Cordeaux, Harvie-Brown, and Scott.