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GEOGRAPHY AT THE BRITISH ASSOCIATION,
 OXFORD, *August* 1894.

BY W. SCOTT DALGLEISH, M.A., LL.D.

THOUGH the Oxford meeting of the British Association was scarcely a "record" meeting, it must rank, as regards attendance, among the most successful of recent years. It derived a certain *éclat* from the presence of the Marquis of Salisbury in the double capacity of Chancellor of the University and President of the Association—a complex position which, as his Lordship humorously said in his inaugural address, imposed on him the double duty of welcoming the Association to Oxford and of acknowledging the University's welcome. The meeting in the Sheldonian Theatre, at which the inaugural address was delivered, was one of the most brilliant functions ever witnessed in the long history of the Association. No one who had the good fortune to be present is likely to forget the impression produced by the appearance of the grand old theatre, all the grimness of which disappeared in presence of the electric light, and the galaxy of fashion that filled it from floor to ceiling. The arrangements for entrance and exit were far from perfect; but they were perhaps as good as the nature of the building made possible.

We are mainly concerned, however, with Section E—Geography. The room assigned to the Section in the new Examination Schools was all that could have been desired—large, lofty, comfortable, well lighted, and easily darkened. The attendance was from first to last exceptionally good, and the audiences held together with quite remarkable constancy. That, however, was evidently due to the popular rather than to the strictly scientific character of the papers and discussions. It must always be remembered that in the British Association two audiences have to be catered for—the scientists and the amateurs—and that the financial success of the meeting depends much more on the latter than on the former. Complaints are often made—they have been made this year—that the treatment of the subjects in some sections is so technical that it repels the lay members, who form the bulk of the membership of the Association. The objection may or may not be deserving of notice; but it certainly does not apply to the Geographical Section. That Section is the happy hunting-ground of the unattached and amateur Associate. Thanks to the profuse and promiscuous use of the magic lantern, it has become the most attractive show-room of the Association. But geography as a science, or the scientific aspect of geography, does not gain much by this ephemeral popularity. The audience is panting for sensations; the ubiquitous and irrepressible globe-trotter is the ideal of the hour, and the sensation is all the greater if the globe-trotter happens to be a woman. The paper which attracts a crowded audience may be a tedious narrative of a holiday spent in Armenia, or in Mexico, or in the desert of Libya, or in Montenegro, or in Arabia; but all its sins are forgiven if it is illustrated by what the official programme calls "optical projections," which means, in common parlance, "lantern slides."

Now, no geographer will question the benefit which geography has derived from photography and the lime light in combination; but the lantern is not everything; and it will certainly fail when its results are used merely for pictorial and not for scientific purposes. Mr. John Thomson, in his paper on "Geographical Landscape Photography," insisted strongly on the use that might be made of the camera in illustrating points of science; and Dr. H. R. Mill, in connection with his paper on "The English Lakes," showed some admirable examples of that kind of work—pictures such as an artist would probably see no beauty in, but which to the eye of science were really beautiful as illustrations of the structure of lake basins and deltas. Dr. Mill's paper was noteworthy in other respects. It was a strictly geographical paper; it was a record of original work; and it showed how genuine science may be made thoroughly interesting and popular. There were a few other papers of the same character, such as Mr. E. G. Ravenstein's on "The Climatology of Tropical Africa," and Mr. H. N. Dickson's on "The Currents of the Faerøe-Shetland Channel and the North Sea." But these were the exceptions. Most of the papers were of the topographical and descriptive character already referred to, and gave the impression that Section E is becoming a medium for the dissemination of travellers' tales, which, however interesting, are of no great value to geographical science. If geography is to hold its place worthily in the British Association it will be necessary to enforce a much higher standard in the admission of papers than that which seems to prevail at present.

These strictures do not apply to the presidential address of CAPTAIN WHARTON, R.N., which, as coming from an experienced hydrographer, was quite appropriately devoted to a survey of our knowledge of the sea—its depth, its temperature, and its movements. Though in no sense popular in treatment, and though it bristled with facts and figures, it proved interesting enough to hold the attention of a large audience for the better part of an hour. Perhaps its most valuable passage was that in which the President summarised our knowledge of the depth of the great oceans; and while Dr. John Murray referred to its omission of the results of some of the most recent soundings, he acknowledged its value and its fairness as a summary of our present knowledge. The following is the passage referred to:—

It is very remarkable, and from a geological point of view significant that the very deepest parts of the ocean are not in or near their centres, but in all cases are very near land. 110 miles outside the Kurile Islands, which stretch from the northern point of Japan to the north-east, the deepest sounding has been obtained—4655 fathoms, or 27,930 feet. This appears to be in a deep depression, which runs parallel to the Kurile Islands and Japan; but its extent is unknown, and may be very large. 70 miles north of Porto Rico, in the West Indies, is the next deepest cast known, viz., 4551 fathoms, or 27,306 feet, not far inferior to the Pacific depth; but here the deep area must be comparatively small, as shallower soundings have been made at distances 60 miles north and east of it. A similar depression has been sounded during the last few years west of the great range of the Andes, at a distance of 50 miles from the coast of Peru, where the greatest depth is 4175 fathoms. Other isolated depths of over 4000 fathoms have

been sounded in the Pacific—one between the Tonga or Friendly Islands of 4500 fathoms, one of 4478 fathoms near the Ladrões, and another of 4428 fathoms near Pylstaart Island, all in the Western Pacific. They all require further investigation to determine their extent. With these few exceptions, the depth of the oceans, so far as yet known, nowhere comes up to 4000 fathoms, or four sea miles; but there can be little doubt that other similar hollows are yet to be found. The sea with the greatest mean depth appears to be the vast Pacific, which covers 67 of the 188 millions of square miles contained in the Earth's surface. Of these 188 millions, 137 millions are sea, so that the Pacific comprises just one-half of the water of the globe, and more than one-third of its whole area. The Northern Pacific has been estimated by Dr. John Murray to have a mean depth of over 2500 fathoms, while the Southern Pacific is credited with a little under 2400 fathoms. These figures are based on a number of soundings which cannot be designated otherwise than as very sparse. To give an idea of what remains to be done, I will mention that in the eastern part of the Central Pacific there is an area of 10,500,000 square miles in which only seven soundings have been taken, whilst in a long strip crossing the whole North Pacific, which has an area of 2,800,000 square miles, no sounding has been made at all. Nevertheless, while the approximate mean depth I have mentioned may be considerably altered as knowledge increases, we know enough to say that the Pacific is generally deeper than the other oceans. The immensity, both in bulk and area, of this great mass of water, is difficult to realise; but to know that the whole of the land on the globe above water level, if shovelled into the Pacific, would only fill one-seventh of it, may assist our imagination. The Indian Ocean, with an area of 25,000,000 square miles, has a mean depth, according to Dr. Murray, of a little over 2000 fathoms. This also is estimated from a very insufficient number of soundings. The Atlantic, by far the best sounded ocean, has an area of 31,000,000 square miles, with a mean depth of about 2200 fathoms.

COLONEL H. W. FEILDEN's paper on "Current Polar Exploration" attracted a large audience, and was listened to with intense interest, which was probably stimulated by the circumstance that he had recently returned from a cruise in Polar waters north of Spitzbergen, in search of the ill-fated Wellman expedition. The paper did not, perhaps, fulfil the expectations of those who eagerly expected new lights; but it was a well-informed summary of current facts. It is gratifying to know that, since the paper was read, the arrival of Wellman and his crew at Tromsø has been announced. That fact does not impair the force of the warning given by Colonel Feilden and others against the rash intrusion of inexperienced enthusiasts into Polar Seas. The following were the most interesting points in Colonel Feilden's paper:—

There were now four important expeditions exploring the realms of the Ice King. In the front rank stood Nansen. There was nothing in the entire history of Arctic adventure that surpassed the boldness and audacity of that explorer's conception. The risk he had calmly and voluntarily undertaken was tremendous. In whatever particular part of the Polar area the *Fram* might now be was a matter of hypothesis. After Nansen got beset in the Polar pack his vessel must be entirely under the influence of the ice-drift. Neither steam nor wind could help her in any appreciable manner. There was every reason to believe that there was a steady circulation of water around the Pole, independent of the surface movements of the ice caused by winds. An examination of drift timber indicated that

there might be some hope of Nansen's audacious and magnificent project being safely accomplished; but even if the *Fram* were lost, he had such confidence in the boldness and resource of the leader that he believed Nansen and his companions would return to civilisation. During the last few days we had received authentic accounts of the loss of the ship which took the young American journalist, Mr. Wellman and his party, to Spitzbergen, and the abandonment of his projected attempt to follow in the footsteps of Sir Edward Parry. He respectfully ventured to offer his humble opinion that inexperienced men should not be encouraged by the great thinking public to rush into Polar and Arctic enterprise. Having described the recovery by his own party and conveyance south of the Wellman despatches, Colonel Feilden referred to the magnificent work of Peary and his Norwegian friend Astrup in North Greenland. From a geographical point of view it was of the highest importance. Whether Peary had been able to connect the East Greenland coast-line from Cape Bismarck with Independence Bay, or whether he had been exploring the frozen archipelago which apparently constituted the northern apex of Greenland, the result would be a splendid addition to our knowledge. From the highlands of Grinnell Land on the opposite shore of Smith's Sound, and nearly in the same parallel as the northern shores of Greenland, he (Colonel Feilden) had looked forth month after month on the great frozen sea. Sir George Nares and he, with the late Lieutenant Lockwood (of Greely's expedition) and Brainard, were the four men who had seen furthest Polewards. He was afraid they might think he was not very sanguine about our reaching the North Pole. With our present resources he was not, but still the most feasible route for making a high northern latitude was by following in Peary's footsteps.

We subjoin summaries of the most important of the other papers read in the section.

DR. HUGH ROBERT MILL *On a Bathymetrical Survey of the English Lakes.*

Ten of the largest English lakes were sounded by the author, assisted by Mr. E. Heawood, Mr. Shields, and others, and the final discussion of the work enables the following tabular statement to be drawn up:—

Name.	Length, miles.	Breadth, yards.		Depth, feet.		Area, square miles.	Volume, million cubicfeet.
		Max.	Average.	Max.	Average.		
Windermere .	10·50	1,610	950	219	78½	5·69	12,250
Ullswater .	7·35	1,100	827	205	83	3·44	7,870
Wastwater .	3·00	880	650	258	134½	1·12	4,128
Coniston .	5·41	870	600	184	79	1·89	4,000
Crummock .	2·50	1,000	700	144	87½	0·97	2,343
Ennerdale .	2·40	1,000	800	148	62	1·12	1,978
Bassenthwaite .	3·83	1,300	950	70	18	2·06	1,023
Derwentwater .	2·87	2,131	1,270	72	18	2·06	1,010
Haweswater .	2·33	600	405	103	39½	0·54	589
Buttermere .	1·26	670	620	94	54½	0·36	537

There are two main types amongst these lakes, the shallow and the deep. The former, including only Derwentwater and Bassenthwaite, are the broadest of all the lakes, and they only average 18 feet in depth. The bed of these lakes may be roughly described as an undulating plain, grooved and ridged into shallow hollows and low shoals running parallel to the long axis of the lake. The second, or deep,

type comprises all the other lakes, the shallowest of which has an average depth of 40 feet. Ennerdale combines the characteristics of both types, conforming to the deep type in its upper, to the shallow in its lower reach. They are long, narrow, sometimes winding like Ullswater, or slightly curved in outline like Wastwater and Haweswater. The most characteristic lie in long narrow valleys with steeply sloping sides, and the slopes are continued under water with almost equal steepness, in some cases with greater steepness, and terminate in an almost flat floor. The typical form of this class of lake is thus a steep-sided flat-bottomed trough, diversified along the slopes by the still steeper conical mounds of *débris* thrown down at the mouths of the streams.

M. E. DELEBECQUE *On the Bathymetrical Survey of the French Lakes.*

As the result of the author's soundings in most of the French lakes, he has produced a series of sheets, published in 1892 and 1893 by the Ministère des Travaux Publics, under the title "Atlas des Lacs Français." The soundings were in every case made by means of a steel wire mounted on a graduated drum, the revolutions of which indicated the amount of wire paid out. The form of apparatus at first used was that of the Swiss Bureau Topographique; subsequently that of Belloc was employed, but finally one designed by the author and weighing only 4 kilogrammes was adopted. The position of each sounding was determined, either from angular measurements of the graduated mast of the boat taken from the shore, or by sextant bearings of objects on shore taken from the boat. A number of lakes have been sounded more roughly than those laid down in the atlas, and many observations of temperature and of the chemical composition of the water have been made. The atlas, which will be completed by the addition of maps of several lakes in the Jura and the Pyrenees, is only a part of a comprehensive work about to be published by the author. In all cases the configuration of the lakes is expressed by contour lines at intervals of 5 or 10 metres, and the position of each sounding is shown by a dot. It was impossible to add the land contours on the same scale, as the French Staff maps do not show them with sufficient exactness.

Mr. H. N. DICKSON *On the Currents of the Faerøe-Shetland Channel and the North Sea.*

The physical observations made by the author on board H.M.S. *Jackal*, on behalf of the Fishery Board for Scotland, during August 1893, were continued in November 1893, and in February and May 1894. The discussions of the observations lead to the following provisional conclusions:—(1) While the Atlantic current flowing over the Wyville-Thomson ridge attains its maximum velocity in winter, its speed is maintained during summer by the greater warmth of the upper layers of water in the Atlantic, and consequent higher level of the surface of that ocean compared with the Norwegian Sea. Passing over the ridge, the Atlantic current is cooled by mixture with the cold water of the Norwegian Sea lying at the bottom of the Faerøe-Shetland Channel, and loses its horizontal motion. The warmer the Atlantic current, the more rapidly does this mixture take place. Hence in a hot, windless summer a mass of Atlantic water, extending to a great depth, tends to collect on the northern and north-western edge of the North Sea bank. (2) At all seasons Atlantic water is drawn from the Faerøe-Shetland Channel and forced into the North Sea by the tides between Orkney and Shetland. The tidal streams run NW. and SE., and an eddy is formed to the north-west of the Orkneys, into which North Sea water is drawn, and perhaps also water from below. (3) As the season advances the surface water of the North Sea becomes warmer, the upper layers

probably receive smaller supplies of fresh water, but they become specifically lighter than the under layers, which they protect from the warming influences of the atmosphere. The upper layers becoming ultimately warmer than the Atlantic current, the surface of the North Sea becomes higher, and the surface water spreads outwards into the Faerøe-Shetland Channel, checking the surface supply of Atlantic water. Meanwhile, the mass of Atlantic water, collecting at the edge of the North Sea bank, seeks entrance into the North Sea. Mixing with the cold bottom water already there, it increases its salinity, but reduces its specific gravity by warming it, and, at a certain stage of the process, the temperatures and salinities of the two waters combine to form a ridge or axis of maximum specific gravity. This axis, which probably runs NE. from Shetland in the end of May or in June, turns slowly toward a N. to S. direction, and moves eastward. As it retreats, Atlantic water is gradually admitted round the north end of the Shetlands, passes down the east side of the groups, joins the tidal stream at the south end, and, guided by the axis of heavy water, is distributed along the east coast of Scotland, probably during July and August. Later in the summer, as the axis retreats still further, the Atlantic water is probably distributed more towards the eastward, perhaps until the latter part of September, when the diminishing supply from the Faerøe Channel, and the increasing outflow from the eastern side of the North Sea, bring about a gradual return to the conditions with which we started.

Mr. E. G. RAVENSTEIN *On the Climatology of Tropical Africa.*

This paper was illustrated by an elaborate series of maps and diagrams. The author said that, by ascending a mountain we might, even in tropical Africa, enter a region the mean temperature of which coincided with that of England, but if we at the same time considered the annual and daily ranges of temperature, we should find that a tropical climate differed exceedingly from that of the temperate regions. In the latter, the annual range was considerable, the daily range small. The character of a tropical climate was the very reverse, for there the difference between the coldest and warmest months of the year was small, while the difference between the temperature of day and night was very great. Nor could we escape these features even though we ascended the loftiest mountains to be met with there. These conditions inevitably led to anæmia and racial degeneracy. Malaria prevailed throughout, even on the plateaus, and some of those explorers who had been loudest in praising the climate as thoroughly well adapted to European constitutions had fallen victims to its deleterious influences. Europeans might certainly 'live' in Africa, with occasional holidays in Europe, and they could superintend native labour, but no locality had been discovered as yet where it would be advisable for European agriculturists and colonists to settle down. The districts most favourable to European settlers appeared to him to be some of the hill stations and the steppe-like plateaus which occupied so large an area in Eastern Africa, and extended southward into Cape Colony. Speaking of the rainfall, Mr. Ravenstein said that it was sufficient in most parts, but very irregular, so that works of irrigation would be required wherever agriculture on an extensive scale was to be carried on. The humidity, which in combination with great heat produced a climate very trying to the strongest constitutions, was, fortunately, not excessive over a considerable portion of Africa, including all the steppe-lands.

Dr. A. MARKOFF *On Russian Armenia.*

In 1892 the lecturer was sent by the Russian Government to report to the central officials on the administration of Armenia. He obtained his information by freely

mixing with the people, and, as he knew all the languages of the people, he gained access to places and sources of knowledge which would otherwise have been closed to him. In June 1892 he started on his own horse from Tiflis to Armenia, and he was not molested either by Kurds or Tartars. He reached Akstafa, situated in a plain on a river of the same name. Nine miles from the town the mountains begin, commanding beautiful views, with rich Tartar villages in the distance. Thence he reached the beautiful pass of Delijan, where luxurious vegetation covers the steep mountain sides. Passing Tars-chai, he crossed the ridge near the village Ryédkin, famous for its ancient tombs, whence he descended into a picturesque valley, into the richest forests of Transcaucasia, and reached Delijan, a most important strategic point, used also as a sanatorium. The road to Erivan rose to 7127 feet above the sea-level. In the village of Seminovka he found people who had been sent to Armenia because they belonged to a sect prohibited by the Russian Church. This was the border of Armenia, and he soon reached the lovely Gotcha Lake, twice as large as that of Geneva, and 6370 feet above the sea level. It is 135 miles round, 40 miles long, and 20 broad. Then, passing the high peak of Achmangan, more than 10,000 feet high, he came to Novobayazet, the capital of the district of the same name, with 97,000 inhabitants, consisting of Armenians, Tartars, Kurds, and a few Greeks. Agriculture and cattle-breeding are the main industries. Here and in the neighbourhood are many old tombs and cuneiform inscriptions. Crossing a ridge of 11,711 feet he reached Eranos, famed for its vegetables. The air is clear and the scenery lovely, affording ample material for the painter.

Mr. G. G. CHISHOLM *On the best Method of Aiming at Uniformity in the Spelling of Place-names.*

The purpose of this paper was to show in the first place that the preliminary requirement indispensable for the attainment of the end stated is to have an adequate scheme of orthography—not adequate in the sense of providing separate signs for all articulate sounds, but making up for the deficiency of such signs by clear rules to be followed with respect to the sounds for which signs are lacking. To leave it to the individual judgment to decide what is the nearest sound represented in the scheme to one for which no express provision is made was bound to lead to confusion. The inadequacy of the latest version of the Royal Geographical Society's scheme from this point of view was then pointed out, and remedies were suggested. The addition of some subordinate rules likely to promote the efficiency of the scheme was next recommended. Attention was drawn to special difficulties in connection with Russian and Greek names, and reasons were given for entertaining the hope that, with the aid of Oriental scholars, special rules might usefully be framed with regard to the spelling of Chinese and Indo-Chinese names. Finally, it was urged that, once an adequate and clearly expounded scheme was adopted, it would be of great importance to make special arrangements to secure the co-operation of all contributors to the *Geographical Journal* and other geographical periodicals, of publishers and authors, and, above all, of the newspaper Press, towards getting the scheme carried out.

Mr. W. H. COZENS HARDY *On Montenegro.*

Montenegro, since the Berlin treaty, has nearly doubled in area. The old Montenegro, which lies near the sea, is made up of bare limestone mountains enclosing fertile basins, the average height of the country above the sea being 2000 to 3000 feet. The Zeta, flowing into the Lake of Scutari, is the chief river,

but this part of the country is almost destitute of water, and the inhabitants are compelled to store snow for drinking. The small village of Cetinje, which forms the capital, lies in one of the mountain basins. In July 1893 the Montenegrins celebrated there the 400th anniversary of the establishment of the earliest Slavonic printing-press, set up not far from Cetinje in 1493. In the new Montenegro, to the north and west, the geographical characteristics are quite distinct. Grassy downs, dense forests, and innumerable mountain streams are found, and there is excellent pasture for sheep. The two highest mountains are Kom and Durmitor, which are slightly under 9000 feet high. The Montenegrins are divided into clans and communes, and possess an elaborate system of local government. At present Montenegro is emerging from an Homeric state of society, and its future depends on the ability of its people to adapt themselves to less warlike pursuits.

MR. OSBERT H. HOWARTH *On the Sierra Madre of Mexico.*

A comparison was made of physical features common to the whole western range of North America from Oregon to Guatemala, illustrated by slides, and by notes from other ranges of great extent—e.g., the Great Atlas and the Caucasus. The means and incidents of travel in the Mexican ranges were described and compared with those of the Rocky Mountains and Sierra Nevada. The probable source of origin of the Sierra Madre races—viz., North American, South American and Asiatic—was discussed and illustrated by a description of various antiquities, including villages, tombs, cave fortifications, and gardens, discovered or visited by the author. Instances were given showing the gradual fusion of these races into the existing Mexican nation of to-day, and the extent to which a few families still remain unabsorbed; as in the case of the Apaches in Sonora, the Cota Indians in Durango, and the Zapotecas of the Tehuantepec Isthmus. Certain peculiarities in the geological structure, vegetable productions, and fauna of the Sierra Madre were noticed, together with legends and traditions amongst the primitive inhabitants arising out of known facts connected with them.

MR. SOMERS CLARKE *On the Geography of Lower Nubia.*

The paper was chiefly confined to that part of Lower Nubia which will be flooded by the proposed Nile reservoir. The differences in size and colour-effect of the scenery in the valley of the Nile above and below Assuan were noticed. The Wadi Kenus, the abode of the Beni Kensi tribe, is nearly coincident with the projected Nile reservoir, and if the proposed scheme is carried out, a population numbering about 30,000 and inhabiting a cultivated area of some 10,000 square acres (?) will be displaced. Population in the Ptolemaic times must have been greater, as there are tracts about Korti and Dakkeh, once under cultivation but now abandoned. In the Dodeka-Schoenus there is a number of temples and remains of antiquity, a further proof of considerable population; and the district is protected by a line of forts, some of very high antiquity, some of later date. The existence of Egyptian civilisation side by side with the ruder customs of the natives is especially to be observed in the method of burial. The present inhabitants on the course of the Nile valley from Assuan to Wadi Halfa exhibit very slight variations in modes of dress, particularly among the women. Men go to Cairo, women stop in the villages, so that the men adopt the ordinary dress of fellaheen in Egypt. In the discussion on this paper, Professor Norman Lockyer observed that the temples of Philæ were founded about 6000 years B.C. It had been suggested that a careful topographical and engineering survey should be made of all the temples, and that all the inscriptions should be transcribed and trans-

lated. Time and money were required for such a work, but the archæological and historical results would be invaluable. Mr. F. C. Penrose desired to express his full concurrence in what Professor Lockyer had said.

MR. YULE OLDHAM *On a New Light on the Discovery of America.*

A glance at the map of the Atlantic Ocean will show the three easiest points of access:—(1) North America by means of the convenient stepping-stones, Iceland and Greenland. (2) Central America, with the help of the steady NE. trade-winds. (3) Brazil, in South America, which is not only the nearest point to the Old World, but has the additional advantage of winds and currents tending in its direction. There can be little doubt that America was visited by Norsemen about A.D. 1000 by the first route. Tradition and the records of some early maps, which show large land masses as far west of the Azores as these are west of Europe, seem to indicate that the second route had been possibly utilised early in the fifteenth century, but the third and easiest was not available till the West African coast as far as Cape Verd had been discovered. It was in A.D. 1445 that Cape Verd was for the first time rounded by one of the exploring expeditions despatched from Portugal by the indefatigable Prince Henry. There is good reason to believe that only two years later Brazil was reached. There is at Milan a remarkable manuscript map, dated A.D. 1448, drawn by Andrea Bianco of Venice. On this map are shown for the first time the results of the Portuguese discoveries as far as Cape Verd, but in addition there is drawn at the edge of the map, south-west from that cape, in the direction of Brazil, a long stretch of coast-line labelled 'Authentic Island,' with a further inscription to the effect that it stretches '1500 miles westwards.' Antonio Galvano in *The Discoveries of the World*, published in the middle of the sixteenth century, says that in A.D. 1447 a Portuguese ship was carried by a great tempest far westwards until an island was discovered, from which gold was brought back to Portugal. As Bianco's map of A.D. 1448 was made in London, it is likely that it represents information about this voyage obtained in Portugal, where Bianco probably called on a voyage from Venice to England. The conclusion to be drawn is that South America was first seen, in the very year in which Columbus is believed to have been born, by one of the Portuguese explorers despatched by Prince Henry the Navigator. In the discussion on this paper, the author's conclusion was challenged by Dr. John Murray and Mr. Ravenstein, on the ground that its argument was purely conjectural, and that, if such a discovery had been made, it would have been known to Columbus and other geographers of the day.

MR. J. T. BUCHANAN *On Researches of the Prince of Monaco in the North Atlantic and the Mediterranean in 1894.*

The paper described the scientific researches of the Prince in his yachting excursions in the *Princess Alice*. Careful soundings were taken in the course of the voyage, and it was found that for a considerable distance eastwards from Gibraltar and Ceuta the surface water comes mainly from the Atlantic. The surface temperature varied from 15° C. to 17·4° C.; but under the influence of hot winds the thermometer rose in the water to 28° C. and 29° C. The Prince introduced several improvements in sounding and dredging operations, and the dredge was successfully employed at great depths. From a depth of 2230 mètres were brought up 89 black ground sharks of a species until now considered to be exceedingly rare. The greatest depth at which the dredge was used was 3610 mètres, on July 8, 1894, when some fishes were brought up which have still to be identified. Life was shown to be abundant where it has hitherto been supposed to be scarce.

MR. THEODORE BENT, *On the Exploration of the Hadramaut in South Arabia.*

Having spoken of the narrow and arid coast-line fringing the Indian Ocean and its peculiar volcanic features, the author proceeded to describe his journey up to the high plateau over 5000 feet above the sea-level, and the geological features of this extensive elevated area. After that he descended into the Hadramaut valley and the collateral valleys running into it, going as far north as the confines of the great central desert of Arabia. He described the great sand rivers of these valleys. There is no running water in the district, but plenty is to be found by digging in the sand, and all the cultivation is therefore carried on by irrigation. He gave some account of this cultivation and the nature of the produce, the commerce, and the present conditions of the inhabitants. Finally, he described his somewhat adventurous return to the coast by another series of valleys, and an expedition he undertook along the coast to ascertain the exact point at which the long Hadramaut valley falls into the Indian Ocean.

DR. JOHN MURRAY *On the Geographical and Bathymetrical Distribution of Marine Organisations.*

The question was, in effect, why similar species were found at the North and South Poles, separated by entirely different species in Equatorial waters. His opinion was that this fact was an argument for the view that at one time a uniform climate prevailed all over the globe, and that the universal ocean was peopled by a universal fauna. When the cooling process began, those forms which could not adapt themselves to the cold migrated to tropical regions. Dr. Murray explained that this uniform climate might have been in existence when the sun was much larger than it is at present, and when, in consequence, the darkest night would be only a strong twilight. The paper gave rise to a lively discussion, in which Dr. Günther, Canon Norman, Mr. H. O. Forbes, and others took part.

Lieut.-Col. H. H. GODWIN-AUSTEN *On Bhutan and the Himalayas East of Darjiling.*

This paper described the country traversed by the last mission to Bhutan, under the late Sir Ashley Eden, in 1863-64, to which the author was attached. As no European traveller had visited Western Bhutan since, the paper contained the latest information on the subject. A fuller abstract than we have space for here will hereafter appear in the *Magazine*.

MR. HERBERT WELD-BLUNDELL *On the Oases of the Libyan Desert.*

The paper described the author's visit to the oasis of Khargeh, Um-ed-Abadeh (now Abbas), Dakhel, Farafrah, Baharieh, and Siwah. Dakhel was an oasis separated from Khargeh by a peninsula of high land, forming part of the Libyan desert plateau, in which the oases were depressions containing the now shrunken tracts of vegetation that rose like green islands from a petrified ocean. Muth was a village of some importance and was built on a mound of bright golden ochre, the streets and people being covered with a bright yellow dust, a relief to the usual dull mud colour of an ordinary Egyptian village. Kasr, a town ten miles to the north, was principally interesting from the vicinity of an Egyptian temple of the second century of our era. The walls inside and the chambers were thickly inscribed with hieroglyphs, but the work was late and inferior in artistic quality. Siwah was described as a sort of ruinous honeycomb of houses piled up on a natural rock in the marshy plain, and surrounded by groves of palms, which were here of an exceptionally fine quality and were almost the only wealth of the

population. This numbered about 20,000 souls. The Egyptian Government was only feebly supported by five soldiers, and was represented by a *mamur*, or prefect, a *cadi*, or judge of ecclesiastical law, and an official correspondent. The temple of Jupiter Ammon was shown, though not much remained of this the oldest oracle in the world to enable archæologists to give much idea of its plan and appearance. The return to Alexandria was over the back of the great Libyan plateau and the road followed by Alexander the Great. The whole journey from beginning to end covered a distance of about 1200 miles.

MISS FRANCES BAILDON *On New Guinea.*

The author and her brother visited British New Guinea in 1891 as guests of the Rev. J. Chalmers, the well-known missionary. They reached Port Moresby in a Queensland Government schooner of 68 tons register on August 15, and after a short stay continued their journey westward for 150 miles to Motu-motu, where the native villages were visited. A canoe voyage was then undertaken to the inland village of Movi-avi, where the natives were suspicious and dangerous. After returning to Port Moresby by the same route, a visit was paid to Kerepuna, and on September 2nd Hood Bay was left for Cooktown in Queensland.

REPORT ON ANTARCTIC EXPLORATION.

The report of the Committee on Antarctic Exploration was read by Dr. H. R. MILL, the recorder of the Section. A committee had been appointed at Nottingham for the purpose of assisting Mr. Bruce to go on another voyage of exploration to the South Polar seas, but the difficulty was that while the Norwegian sealers and whalers might take out the explorer, there was a risk that they might not be able to bring him back in the following year. The Committee in the circumstances could not take the risk of causing the death of an eminent scientist. There was, however, it was stated, a strong movement in favour of Antarctic exploration, and the Committee pressed upon the Council of the Association the desirableness of memorialising the Government to take the matter up. This view was strongly supported by Sir Edward Osmann, who said that a great naval country like this should always have some of its ships engaged in scientific research. Such work was always popular with the men and gave prestige to the service.

At the concluding meeting of the General Committee it was announced that the number of members and associates enrolled at Oxford was 2321, a number in excess by several hundreds of last year's meeting. The following proposals of the Committee of Recommendations were adopted, namely, that Section D be called zoology instead of biology; that a separate section be constituted for botany; that Section I should include physiology, with experimental pathology and experimental psychology. It was also proposed that Section I be separately formed for the first time at the Liverpool meeting in 1896.

At the General Meeting, the following grants were made to the Section of Geography:—Mr. E. G. Ravenstein—Climatology of Tropical Africa, £5; Mr. H. Seebohm—Exploration of Hadramaut, £50.