

GEOGRAPHICAL NOTES

SOME time back it was publicly stated that Commander Cheyne and his friends intended to apply to the Geographical Society for countenance and support to their plans of Arctic exploration. A deputation accordingly waited on Lord Aberdare, the president, on October 12, and, in pursuance of a suggestion he then made, a statement of Commander Cheyne's plans was lately drawn up by a committee for submission to the Council of the Society. This has been considered, and in reply the President and Council regret that the scheme, as explained by the statement, does not commend itself to them as one containing the elements of success and of usefulness, and that, even if it were feasible, the means proposed to be adopted for encountering the great dangers and difficulties necessarily attendant upon such an enterprise, do not appear to them sufficient. We believe the Geographical Society is to take up the subject of Arctic exploration this session. An Arctic Committee will be appointed to bring together all that has been done since the last English expedition, to enable the Society to decide what steps they should take.

THE post of honour in this month's issue of the Geographical Society's *Proceedings* is naturally assigned to Mr. J. Thomson's report of the journey of the East African Expedition, of which we have already given a *résumé*. It is illustrated by a map showing his route, constructed from the explorer's original map and other sources. There is also a useful little map of a route from Kagéi to Tabora, by the Rev. C. T. Wilson of the Church Missionary Society's Nyanza Mission. Capt. A. H. Markham's "Visit to the Galapagos Islands in 1880" follows, with some observations by Mr. Osbert Salvin on recent additions to our knowledge of the fauna of the group. From the geographical notes we learn that medals and other rewards are to be presented to Mr. Thomson's native followers, and that Dr. Kirk is to receive the formal thanks of the Society for the important services he rendered to the East African Expedition. Some interesting extracts from Capt. Carter's diary on his fatal march from Karema are next given, with a summary of recent news respecting African exploration. The remaining notes deal with M. Mushketof's ascent of the Zarafshan glacier, Russian explorations in Eastern and Western Siberia, surveys in Turkey, and an attempt to explore the affluents of the Rio Purús.

MR. J. BANTING ROGERS has devised and published a game which is likely to be of service not only as a really interesting amusement, but also as a means of acquiring a considerable knowledge of navigation and meteorology. It is entitled the game of a "Voyage Round the World," and is played on a large board representing the ocean, suitably divided for counting by knots, and with hazards in the shape of cyclones, collisions, &c., which add excitement to the game. The game is played by means of a number of small models of ships of various kinds, and cards in which the number of knots is marked within which the players may move. Logs are kept, watches appointed, and a captain of the watch to record distances, &c. Altogether it will be seen that in Mr. Rogers's ingeniously devised game there are great possibilities both of amusement and instruction.

TWO Danish Expeditions which have been carrying on scientific exploration in Greenland have returned to Copenhagen. One of them, under Lieut. Hammer, has been continuing the investigations into the movement of the mainland ice into the fjords and the formation of icebergs. In the course of the summer several previously unknown fjords were visited, and the western part of the island of Disko surveyed and mapped. The other expedition, under Lieut. Holm, was to explore several of the large ruins of former settlements in the district of Julianhaab and to obtain information on the population and condition of the east coast. Several extensive ruins were found, which must have been left quite 100 years ago, and of which the present natives know nothing. Among these ruins many objects of ethnological interest were found. The weather during the whole summer was rainy and cloudy; indeed people who have been many years in Greenland never knew of so rainy a summer.

WE believe there is some prospect of Mr. Joseph Thomson being engaged to lead an expedition from Sierra Leone towards Timbuctoo, mainly to establish trading relations between the English Colonies and the interior. It would be a pity should Mr. Thomson be compelled to become a mere trading caravan leader.

MAJOR SERPA PINTO's account of his remarkable journey, which is still unpublished, is to be called "How I crossed Africa," instead of "The King's Rifle."

THE following telegram has been received in St. Petersburg from Col. Prejevalsky:—"Have finished my travel. Rich collections: 2000 birds, many mammals, 1300 species of plants. Will be in St. Petersburg at the beginning of January."

AT the last meeting (November 17) of the Russian Geographical Society, Dr. Piasetzky read an interesting paper on China. He has very closely studied the character of the Chinese, their life, their moral principles, and the education of children. Dr. Piasetzky, who has travelled during several years in China, is the author of a very interesting Russian work in two volumes on that country: the work is illustrated with very good drawings, which represent "types" of Chinese towns, streets, dwellings, market-places, &c. At the same meeting the Society resolved to take part in the next Geographical Congress and Exhibition at Venice.

BEFORE proceeding to Paris, as we mentioned last week, MM. Verminck, Zweifel, and Moustier were present at an enthusiastic meeting of the Marseilles Geographical Society, when the President, M. Rabaud, after a eulogistic address, presented them with medals for the part they respectively took in the expedition to the sources of the Niger.

LIEUT. E. W. PETLEY, of the Marine Survey of India, has lately drawn up some interesting notes on Marmagao (Goa), Portuguese India.

THE new *Bulletin* of the Antwerp Geographical Society contains an account of Mr. Andrew Goldie's last journey in New Guinea, and some observations on artesian wells in the Sandwich Islands.

MR. TODD, the Government Astronomer at Adelaide, is to proceed next May to Port Darwin, in the Northern Territory, to determine by telegraph the difference of longitude between that place and Greenwich.

A RECENT telegram from the Austrian traveller Oscar Lenz states that he had reached Medina, Senegal, on November 2. Oscar Lenz penetrated to Timbuctoo from the north, and went thence by Bassikonon, Sokolo, Goumbon, Nioro, and Konniakany to Medina.

HERR STIER, director of the Gymnasium in Zerbst, found, a short time ago, a detailed account of Vasco da Gama's second voyage to India. It is drawn up by a Dutchman (who accompanied Vasco da Gama), and in his own tongue. Herr Stier has now published a German translation of it.

MR. MUNDELLA ON EDUCATION IN SCIENCE

ON Friday last the Textile and Dyeing Departments of the Yorkshire College, Leeds, were formally opened, and at the dinner which followed the Right Hon. A. J. Mundella, M.P., Vice-President of the Council, proposed the toast of the occasion:—"Success to Yorkshire College." His remarks in connection therewith are so significant, coming from our *de facto* Minister of Education, that we give them in full.

There had not, he commenced by saying, been a more gratified spectator of the proceedings of that day than he was. There had been no one amongst them who had enjoyed more, if so much, the sense of satisfaction—he had almost said of triumph—that he had enjoyed that day. Sixteen years ago when he was, like many of those present, a captain in the ranks of industry, he took some interest in the question of the application of science to the industries of this country. His attention had been called to it by the advantages he possessed of seeing what was being done in other countries. He saw the infancy of technical education abroad, and now he stood by its cradle at home. The School of Arts et Métiers in Paris was not by any means a new school, and it had done great things for French industry. There was no one who was acquainted with that school who would not endorse his remarks when he said that it had done marvellous things for French manufactures, and he had learned since he came to Leeds that we had some of its most distinguished scholars in this town. He witnessed the beginning of technical instruction in Germany with the erection of the Polytechnic School of Zurich; and when he went to the members of the Chamber of Commerce of which he was

president, and told them what he had seen, the answer was that they had great doubts about the success of the experiment. It was thought then that the practical place to give technical instruction and teach the application of science to industry was in the workshops. They had now satisfied themselves, however, that whilst they could not dispense with the practical experience of the workshops, there was something that gave value to that experience. Let them take the art of dyeing for example. What was the old system of training in regard to it? The dyer did not then ascertain the properties of the articles with which he had to deal with that skill and accuracy with which the young men of Leeds were ascertaining them to-day. It used to be a bucketful of this, a shovelful of that, and a handful of the other. But the days of the old rule of thumb were numbered; and on standing at the cradle of the Yorkshire College he stood by the grave of the rule of thumb. He had been greatly encouraged this week by his visit to Yorkshire. He came to it somewhat in a state of despondency: not however with reference to elementary instruction, for the people of Yorkshire were doing wonders in that way, and in a few years hence this county would compare favourably in that respect with any part of the globe. But he had been examining recently, not for the first but the tenth time, what was being done on the Continent in the way of technical education. They had opened a good school in Leeds, but they must not flatter themselves. They must not believe that the 25,000*l.* which his friend Mr. Denison had indicated was the sum wanted to complete the work. He had stood in an industrial town of 70,000 inhabitants, in which a single building that had been erected within the past three years solely for teaching science, as applied to industry, had cost 100,000*l.* He had stood in three or four such towns. He had examined technical institutions in France, in Switzerland, and in the south and north and centre of Germany, and all he could say was, that not having examined these institutions critically for five years, he stood amazed and almost aghast at what he beheld. He came home feeling that in the countries he had mentioned they had found the weak place in our armour, and had wounded us in our tender part; but what he had seen in Yorkshire within the last week had given him renewed confidence and courage. He found, in addition to this splendid institution which had been opened to-day, that in the little town of Keighley—a very splendid little place—they were going to spend 5000*l.* in a weaving-school; that the Clothworkers' Company of London were going to assist Bradford also; and he was told that in Huddersfield they had got 15,000*l.* or 16,000*l.*; that they had no longer to teach elementary instruction in their night-classes, but wanted to give scientific and technical instruction to their workmen, and wanted a school for Huddersfield. Yesterday he stood by the grave of an eminent Yorkshireman who had done noble service to the teaching of science in Yorkshire—his friend Mr. Mark Firth. Would they not see that Yorkshire had many as worthy sons as Mr. Firth? Surely he was not the last man that would endow a college for science teaching. There were men, he hoped, within the sound of his voice who would perpetuate their memory, and show some gratitude to the industry that had made them wealthy by endowing another wing of the College like the one they had seen to-day. They must not believe that this was mere amateur work. This was not science teaching merely for the sake of scientific research, for arriving at scientific truth, or for giving intellectual culture. Those nations on the Continent who had produced such magnificent buildings, machinery, and apparatus to conduct this work were not doing so from sentimental reasons. They were not doing it with the object simply of endowing scientific research, or to make great progress in any particular branch of science. Their object was a very prosaic and a very practical one, and very full of self-interest. What they meant was to get industrial strength, which they believed was the real source of the wealth of their nation. The Yorkshire College was founded to supply instruction in those sciences which were applicable to the industrial arts. He might say as the result of his recent observations that France and Germany were conducting as active a competition with each other in this matter of arming for the industrial fight as any of the nations of the Continent of Europe were in their military armaments with a view to any catastrophe in future. But this was not a case in which Englishmen could look on with benevolent neutrality, because after all in this international fight they could not stand aloof, they could not remain neutral, for the blow, whenever it fell, would fall upon them. Rely upon it the success of the Science College of Yorkshire meant the success

of Yorkshire itself. They possessed great natural resources for which their Continental neighbours envied them. They had in their immediate neighbourhood, in the mine, the coal and iron; they had in their people great vigour, great energy, and great inventive capacity; and they had also their old prestige. They had amongst them men of great wealth. There was his friend Mr. Denison ready to provide them capital very freely—at a very moderate rate. England, after all, was the great emporium as a depôt market for nearly all the raw material of the world. To London came that Australian wool so many thousands of bales of which were exported to their neighbours on the other side of the water, and then came back to them in a finished state for the consumption of their own population. He was speaking from actual knowledge when he said that there was an enormous increase in the manufacture of dressed goods that could be well made in Yorkshire, that could be produced and sold in Yorkshire, and that were yet made abroad, but ought to be made at home. He believed the step they were taking that day in opening the College was the very way to create that employment at home which at present was too much done abroad. It had been said that the country gentlemen ought to assist in this movement. Lord Frederick Cavendish had come from a great and honourable house, and they all rejoiced in the wealth, ability, business capacity, sagacity, and liberality of that house. But what was it that had made these great houses and England wealthy? Was it not the value which had been added to the land by the success of the great manufactures? The success of the great houses of England was bound up in the success of the Yorkshire College and of other colleges like it. Thus to the success of their manufactures they must look for the continued greatness of England in its dealings with nations in the future. Why, they had but the same area of land now as they had when their population was only 10,000,000. They had 25,000,000 of people in England and Wales now, and they were multiplying at a rate which would soon double this number. What was it that was to feed all these people but the success of their manufactures? If they were to hold their own they must not lose a point; they must not neglect a single opportunity; they must not rest content on their old prestige; but they must, as Englishmen, look the difficulty in the face, and, where weakness existed, strengthen themselves, and this weakness was to be found entirely in the question of education, which they had too long neglected. In asking them to drink success to the Yorkshire College, he was asking them practically to drink to themselves. If they wished perfect freedom to carry on this work, he was quite of the opinion of Lord Frederick Cavendish that they must adopt the newest methods—to be untrammelled in their efforts, to carry on the College by themselves, and in that way in which Englishmen had been accustomed to do their work.

THE ROYAL SOCIETY—ADDRESS OF THE PRESIDENT¹

II.

THE aspect of spectrum analysis has become much complicated by two sets of facts. First, the increased dispersion, the improved definition, the enlarged electrical power at our command, and, above all, the substitution of photography for eye observations, have revealed to us an almost overwhelming array of lines belonging to each substance. And, secondly, the same means have shown that many substances present different spectra when in different molecular states. These complications have led spectroscopists to seek some relief in theories of simplification. Lecoq de Boisbaudran, Stoney, Soret, and others have suggested that many of the lines, or groups of lines, may be regarded as the harmonics of a fundamental vibration; and they have shown that in certain cases this view will account for the phenomena observed. Professors Liveing and Dewar have contributed largely to the subject by their observations on the reversed lines. Looking in another direction, Mr. Lockyer considers that in increased temperature we have the means not only of resolving compound bodies into their elements, but even of dissociating bodies hitherto regarded as elementary into still more simple substances. There still remain serious difficulties connected with Mr. Lockyer's views; but it is to be hoped that his indefatigable energy will in some way or other ultimately overcome them.

¹ The outlying parts of the spectrum, beyond the visible range, Address of William Spottiswoode, D.C.L., LL.D., the President, delivered at the Anniversary Meeting of the Royal Society on Tuesday, November 30, 1880. Continued from p. 114.