GEOGRAPHICAL NOTES.

THE Royal Geographical Society's *soirée* took place on the 17th inst. at the South Kensington Museum, when the guests were received by the President and Council. The attendance was very great. The attractions of the evening included selections by the Coldstream Guards band, solo and part singing in the lecture theatre, and an exhibition by the dioptric lantern of maps and views, with explanation by Mr. H. J. Mackinder.

SOME interesting particulars as to the present state of the Marshall Islands are published in the *Deutsches Kolonialblatt*. The population is estimated at 15,000 aborigines, and about 100 whites. Cocoa-nuts and copra are the staple exports; pandanus, breadfruit, and arrowroot being cultivated on a small scale. The natural grass is not suitable for pasture, but with the introduction of foreign grass seed, cattle and sheep breeding may become profitable. Taking into consideration the character of the soil and the density of population, the future of the German protectorate in the Marshall Islands is acknowledged not to be very bright, although the authorities hope that it may become of enhanced importance for trade with Germany.

THE *National Geographic Magazine* has just published an account by Dr. Charles Willard Hayes of the expedition through the Yukon district in 1891, conducted by Mr. Schwatka on behalf of a syndicate of American newspapers. Entering by the Yaku inlet, the expedition made its way by canoe, as soon as the ice disappeared, up the Yaku River; thence it crossed the watershed, and continued on Lake Ahklen and the Teslin River to Lewes River, a tributary of the Yukon. A traverse survey was made all the way, and the route laid down in a serviceable manner, though of course without the precision of an actual survey. This district has been several times visited by prospectors, and parts of it mapped by previous explorers; but the expedition opened up, probably for the first time, the unknown region extending from the Yukon to the St. Elias Mountains. Across this blank, usually filled in hypothetically on maps, the expedition surveyed a line of 330 miles, from Selkirk, on the Yukon, to the junction of the Chittenah and Nizzenah rivers. The report gives a clear summary of the topography, drainage, orographic system, and geology of the region traversed.

PRINCE HENRY OF ORLEANS has returned to France after a difficult journey from the Upper Mekong, through the Shan States and Siam, where he reached the coast at Bangkok.

CAPTAIN W. G. STAIRS, whose quiet heroism in Stanley's Emin Relief Expedition was brought prominently before the world two years ago, has fallen a victim to African travel. He was born at Halifax, Nova Scotia, in 1863, and educated at Merchiston Castle School, in Edinburgh, subsequently studying at the Royal Military College, Kingston, Ontario. After his training in Canada he spent some time in New Zealand as a civil engineer; but obtaining a commission in the Royal Engineers, he came to Chatham, and completed his military training. When the Emin Relief Expedition was fitting out in 1887, he volunteered to accompany it; and from the first he impressed Mr. Stanley as a man of exceptional qualities—an opinion strengthened by the strict obedience and absolute loyalty which distinguished him throughout the trying years that followed. As the only member of the advance party (Dr. Parke excepted) who had much interest in scientific matters, Captain Stairs would undoubtedly have made large additions to knowledge had it not been for the imperative exclusiveness of his work as an officer. He was selected for the best piece of geographical exploration attempted during the expedition—the ascent of Mount Ruwenzori. Last year Lieutenant Stairs was promoted to a captaincy, but the fatal attraction of Africa led to his resignation in order to accept command of the Katanga Company's expedition. This Company was formed in Belgium to administer and exploit the south-eastern corner of the Congo Free State, in what is known as Msidi's country. Stairs left Zanzibar last summer, crossed to Lake Tanganyika by the familiar trade route *viâ* Tabora, and reached Mpala on October 31, after a remarkably rapid and easy journey. Thence he traversed Msidi's country in the rainy season, where he suffered much from fever, but succeeded in reaching the Ruo on May 13, and arrived at Vicenti, near the mouth of the Zambesi, on June 3. But at Chinde, just as the expedition had overcome all the difficulties of the way, and only waited for a passage to Zanzibar, Captain Stairs died. This sad event has removed from the list of African travellers one of the bravest, most prudent and modest of young explorers.

THE MICROSCOPE'S CONTRIBUTIONS TO THE EARTH'S PHYSICAL HISTORY.[1]

MEN will have forgotten much when the second half of this nineteenth century is no longer remembered. Whatever may have been its faults, it has no rival in the past history of the world as an epoch of scientific progress. This progress has been largely due to the felicitous co-operation of the mind of the student with the skill of the craftsman in the more perfect construction of instruments of research. By them darkness has been made visible; the opaque, translucent; the unseen, conspicuous; the inert, sensitive; silence, vocal. A thousand methods of experiment, tests of the most delicate nature, have been devised, so that vague conjecture has been replaced by exact knowledge, and hypothesis by demonstration. In such an epoch it may seem a little fanciful to select any one term of years as exceptionally fruitful; but it is remarkable that in the first decade of this half-century, science was enriched by three contributions, each of which has led to consequences of far-reaching import. In 1858 Charles Darwin and Alfred Russel Wallace announced simultaneously the conclusions as to the origin of species at which they had independently arrived, and the well-known book by the former author appeared in the following year. They thus formulated the results of protracted investigations and patient experiments with the simpler appliances of earlier days. They subjected, more strictly than ever before, the facts of nature to an inductive treatment, and thus lent a new impulse to biological science. Their hypothesis gave a definite aim to the researches of students, and kindled an unquenchable flame of intellectual activity. In 1860, Bunsen and Kirchoff announced the results of applying the spectroscope to problems in chemical analysis. By means of this instrument not only have investigations attained a precision hitherto impossible, but also the student, no longer cribbed, cabined, and confined, to the limits of the earth, can question the stars in their courses, and bid nebulæ and comets reveal the secrets of their history. Lastly—though the problem be in a humbler sphere, dealing with neither the immensities of stellar physics nor the mystery of life—Henry Clifton Sorby, in 1856, described the results of microscopic investigations into the structures of minerals and rocks. Strictly speaking, indeed, the method was not wholly novel. So long since as 1827, William Nicol, of Edinburgh, had contrived to make sections of fossil wood sufficiently thin for examination under the microscope; but the device, so far as I know, had not been generally applied, or its wide possibilities apprehended.

You have heard in this place on former occasions of the triumphs of the spectroscope in extra-terrestrial space; of the revelations of the microscope in regard to the least and lowest forms of life; I have ventured to ask your attention to-day to the work of that instrument in a humbler and more limited field—the constitution and history of the earth's crust. My task is beset with difficulties. Did I address myself to experts, these would be but a small portion of my audience; if I speak to the majority, it will be hard to make intelligible a subject bristling with technicalities. Moreover, as this building is so ill-suited for the usual methods of illustration, I have decided to dispense with diagrams or lantern slides, and will try to tell, in the plainest language at my command, the conclusions as to the genesis of rocks and the earlier history of the earth to which the researches of the last few years seem to be tending.

I have excluded from my story investigations which bear upon the biology of the past, though the work of the microscope in this field has not been less fruitful or interesting, because these are more widely known. Moreover, they have not specially engaged my attention, and there is, I believe, an expectation amounting to an unwritten law, that whoever has the honour to occupy my present position should be so far egotistical as to talk of the particular plot, however small it may be, on which he has laboured in the garden of science. So I will crave the indulgence of the few experts present, and the patience of the majority of my audience, while I try to tell the story of microscopical research into the history of the earth's crust.

Twenty years ago, I believe, not half that number of geologists in the British Isles made any real use of the microscope. Now they may be counted by scores, not only in the United Kingdom, but also in every civilized land. Obviously in a science so new, in a research which is extending so rapidly,

[1] The Rede Lecture for 1892, delivered before the University of Cambridge, by T. G. Bonney, Sc.D., F.R.S.