

dog's hair to their chiefs' staffs. One of those peculiar cords was a very remarkable one; it was a small cord, bound closely round throughout its whole length with a much smaller one (something like the silver or fourth string of a violin). I never saw this kind but once, and that was at the East Cape, in 1838. A specimen of it I shall now exhibit. This cord was used for a single and particular purpose, attached to the small under-aprons of girls—chiefs' daughters.

Their larger cords and ropes were composed of several strands, well twisted and put together. Besides their round ropes so made, they had also flat ones of various widths, which were plaited or woven, resembling our webs and bands, and much used as shoulder-straps in carrying back-loads; also double-twisted ropes, and three-strand ones; likewise a remarkably strong one that was four-sided. This was made of the unscraped leaves of the cabbage-tree, that had been gathered, and carefully wilted in the shade, and then soaked in water to make them pliant. It was used for their anchors, and other heavy canoe and house requirements. The leaves of the flax would not be suitable for this purpose. I have had all those different kinds of cords and ropes made for me in former years, but I much fear the art of making them is lost.

There were also their nets for catching fish and for other purposes, with their meshes of various dimensions. Their smaller caes (hand nets) were made of all manner of shapes and sizes. Some of them were dexterously stretched over circular skeleton framework. And their large seine-nets, used for catching mackerel and other summer fish that swam in shoals, were very long and very strong, made of the leaves of flax, split and prepared, but not scraped, and completely fitted up with floats, and sinkers, and ropes, and other needful appurtenances. Cook, who was astonished at their length, has written much in praise of them. I make one striking quotation: "When we showed the natives our seine, which is such as the King's ships are generally furnished with, they laughed at it, and in triumph produced their own, which was indeed of an enormous size, and made of a kind of grass [*Phormium*] which is very strong. It was five fathoms deep, and by the room it took up could not be less than three or four hundred fathoms long."¹ (Voyages, vol. ii., first voyage, pp. 369, 370.)

In residing at Dannevirke, in the Forty-mile Bush district, during several months, I have often noticed the Maoris from neighbouring villages coming to the stores there to purchase tether and other ropes and lines (large and small) for their use with their horses, ploughs, carts, pigs, &c., while on their own lands and close to them the flax plants grew in abundance. These Maoris had very little to occupy their time, and could easily have made common lines and ropes for their own use if they knew how to spin them as their fathers did, and also possessed their forefathers' love of work.

UGANDA.

At a special meeting of the Royal Geographical Society on the evening of November 3, Captain F. D. Lugard gave an account of the geographical aspects of his work in Uganda. The hall of the University of London was crowded, and although the issue of extra tickets was suspended, a large number of Fellows and their friends failed to get admittance. An excellent hand-map, by Mr. Ravenstein, enabled the audience to follow Captain Lugard's route. The first part of the paper was concerned with the journey from Mombasa along the Sabakhi river, an unnavigable stream, to Machako, the furthest station of the I. B. E. A. Company at that time, the district passed through being almost uninhabited, and supplies difficult to procure. The greater part of the paper related to Uganda and the other countries surrounding the Victoria Nyanza, where Captain Lugard was in command for two years. On the Kavirondo plateau, east of the lake, there is a promising field for European colonization. The plateau is crossed by the Equator, but at elevations of from 7000 to 8000 feet the climate is cool and exhilarating. It is possible, judging from experience in other

¹ An interesting historical tragic story of the cleverly-planned taking and death of a large number of Maoris in one of these seine-nets, together with the fish (illustrating what Cook has written of their immense size), and of the deadly warfare that followed, is given in the Transactions N.Z. Institute vol. xiii., p. 43.

places, that highlands close to the Equator are healthier for Europeans than those of similar mean climate lying nearer the tropics. Kavirondo is admirably adapted for grazing, and ranches similar to those of the west of America might be tried. From the pasture lands of this plateau the transition to the rich plantations of bananas and casava of Usoga and Uganda is very marked, and the unclothed natives of Kavirondo give place to the comfortably-dressed Waganda, a warlike people, but skilful in all the arts of peace.

Uganda is a land of low hills and valleys. The hills are of red marl, or marl-gravel, and shale, generally covered with pasture grass of a kind apparently peculiar to these countries. The valleys are generally of rich black soil, and most frequently the lowest part of the dip is a river swamp. The swamp varies from a few score of yards to a mile or more in breadth, usually being from half to three-quarters of a mile. There is a slight trickling current—but very slight; the river is choked with dense papyrus, with an undergrowth of marsh ferns, grass, reeds, &c. The water is usually the colour of coffee, and red with iron rust. Most of these swamps are of treacherous quagmire without bottom; and unless the roots of the papyrus form a sufficient foothold it is necessary to cut down reeds and boughs of trees to effect a crossing. It is a singular characteristic of these countries that, spite of their altitude and hilly character, rushing water is rarely, almost never, to be seen. Thus Uganda has a mean elevation of some 4200 feet, and borders the trough of the Victoria Nyanza at 3700 feet only, and is a country full of hills and valleys. Kitagwenda, at about the same altitude, borders the Albert Edward Lake at 3300 feet. Unyoro, with more lofty hills and peaks of granite, with an altitude gradually increasing in the south, as you near the Albert Lake, to some 5300 feet, similarly borders the trough of the Albert, which has an elevation of only 2000 feet. Yet nowhere are these river swamps more frequent than here in South Unyoro at the highest altitudes. The origin of the water to supply the enormous Lake Victoria is an interesting problem. Throughout the British sphere, on the north and west of the lake, there is no single river, except the Nzoia, which is worthy of the name flowing into the Victoria. The Katonga—marked on the maps as a big river—is merely a broad papyrus swamp. It is by no means so important a drainage as the Marengo; and all the endless river-swamps (including the Marengo) send their sluggish streams northwards to the Kafur and the Somerset Nile. The superficial area of the Victoria being 27,000 square miles, crossed by the Equator, and at an altitude of about 3800 feet, an enormous amount of evaporation must occur, and yet spite of this evaporation, there issues from its north-western corner the magnificent Somerset Nile, a deep, broad, silent river.

The close of the year 1891 and the early part of 1892 were exceptional in the matter of rainfall. Usually in this part of Africa the lesser rains begin early in October and cease in the middle of December. From that time the heat and drought increase, and the grass dries up and is burnt, till in the beginning of March the greater rains set in, and a tropical downpour continues with few breaks till the end of May. Last October and November the lesser rains were unusually heavy, and continued with little intermission till the time of the regular rains in March. There was a little check, and then the rain continued up to the middle of June and later. The result was, that the Lake Victoria was some six feet perhaps above its ordinary level, and may probably rise still higher. Unusual floods occurred in the Nile in Egypt during September, this not being the time at which the usual high Nile due to the Abaras floods occurs.

Uganda is divided into ten provinces, and the ten chiefs who rule these districts entirely drop their personal names, and are called by the traditional title attached to those provinces. Of these the four largest and most important have separate titles. Thus, the chief of Chagwe is the Sekibobo; of Singo, the Mukwenda; of Buddu, the Pokino; and of Bulamwezi, the Kangao. The remaining six are called by the title of their province, viz. Kitunzi, Katambala, Kasuju, Mugema, Kago, and Kaima. Superior in rank to these ten governors of provinces are the Katikiro (the vizier and chief magistrate of Uganda), and the Kimbugwe. These two hold innumerable estates, scattered throughout the country.

In June, 1891, Captain Lugard left Uganda with the object of coming in touch with the Soudanese refugees from the Equatorial Province, who had assembled at Kavalli's, on the south-

west shore of the Albert Lake. Marching from near Masaka, the capital of Buddu, he traversed Northern Ankole, a district hitherto unvisited by any European, though Mr. Stanley, in 1876, had travelled parallel to it within the boundaries of Uganda, and reaching the borders of Kitagwenda, proceeded south-west to the narrow channel or river which connects the upper lake of Rusango with the main waters of the Albert Edward Lake. Crossing this narrow channel (at most 500 yards wide) the force camped in the hostile country of the Wasura, a tribe subject to Kabarega of Unyoro, and identified with the Wanyora. Here they crossed Mr. Stanley's route at the Salt Lake; but since his book nor maps had not then reached Central Africa the journey was in the nature of entirely new exploration, though of course the discovery of the Albert Edward Lake and of Ruwenzori had been anticipated. The natives, too, being hostile, no one was met with who had seen Mr. Stanley, or could give information of his route, or tell of his exploits. On the route to the Albert Lake many deep and almost symmetrically circular depressions like the crater of a volcano, or a dried-up pond, were passed. A few of these, as shown on the map, were tiny lakes no bigger than a mill-pond, but apparently of great depth, with clear blue water, and all the characteristics of a lake. The alligator and great fish eagle haunted their waters. Others, again, were dry, the bottoms being perhaps 100 feet or more below the level of the surrounding country, which is about 4200 feet above the sea.

The Lake Albert Edward consists of two portions, the Mwutan-zigé (Barrier to Locusts), or the Great Lake and the Rusango on the north-east. This latter is in reality a separate lake, connected with Mwutan-zigé by a river. Its general direction is north-west and south-east. There is no swamp around it except at the north-west end, where dense jungle and impenetrable marsh afford a home for great herds of elephant. It is at this point that the rivers Wami and Mpanga, into which the countless streams from Ruwenzori flow, bring their waters to the lake. The gorge through which the latter flows is picturesque in the extreme, especially in the rains. The great body of water confined between its rocky walls boils and eddies over the sunken rocks below. The gorge is some 700 feet deep, and is full of tropical forest. The orchids, ferns, and mosses which are found in such a natural forcing-house, where the damp vapours hang, are extremely luxuriant.

Captain Lugard followed the eastern base of the Ruwenzori Mountain, crossing the endless streams which descend from its perpetual snows, and bear their clear, sparkling, icy-cold water to the Wami and Mpanga, and so to the Albert Edward. The drainage of the eastern Ruwenzori is not towards the Albert and so to the Nile, but to the southern lake, from which the only overflow is the Semliki, a river which at its exit probably conveys a lesser volume of water from the Lake than is contributed to it by the Mpanga alone. The ground rises gradually from the level of the Albert Edward 3300 feet to some 5300 feet at Kiaya. Here the route descends into the head of a narrow valley, while the plateau trends away to the right, and forms the uplands of Unyoro, its bold outline appearing from the Semliki Valley and the Albert Lake like a lofty range of hills. The valley of Kiaya is extremely fertile, intersected with streams, and studded with banana groves and cultivated land. Between the edge of the plateau on the east and the base of Ruwenzori there is a deep trough, or gorge, the hills rising steep as it were from their own foundations without connection with the plateau, which reaches to their very feet. Leaving Kiaya, they passed through a wild country of quartz and scrub jungle, cut at right-angles by gigantic ravines of rich soil, in which are villages, forest, and cultivation. This led to the edge of a lower plateau, overlooking the Semliki valley. Simultaneously the massive peaks of Ruwenzori sloped down to lesser hills, and mingled with the plain, and a new range of mountains, increasing in height from south to north, appeared opposite. Mountains they appear, but, like those left behind, they are really the escarpment of the plateaus on which the sources of the Ituri, and the other great affluents of the Congo, take their rise; which, for convenience, may be called the Kavalli plateau. From Kavalli's Captain Lugard escorted 8000 Sudanese troops, who had by their vacillation retarded the departure of Stanley with Emin for the coast. Some of these he settled in forts to protect Uganda from Kabrega's raiders, while others were sent back to Egypt by Mombasa.

SCIENTIFIC SERIALS.

American Meteorological Journal, October.—A meteorological balloon ascent at Berlin by A. L. Rotch. The ascent was made on the morning of October 24, 1891, and at the same time a captive balloon was sent up to 600 metres. The weather was hazy up to about 1000 feet, but above that the sky was nearly clear. The mean decrease of temperature between the ground and the captive balloon was 0.6° C. per 100 metres. In the stratum of air between the captive and free balloon (700 to 1000 metres) the decrease was much slower during the morning, there being at first an increase, the temperature at 693 metres was 10° C., and at 858 metres 10°.4. In the afternoon the rate of decrease in the upper stratum became nearly the same as that which prevailed in the lower stratum during the morning.—Improvement of weather forecasts, by Prof. H. A. Hazen. The author recommends the study of moisture conditions at various heights in the atmosphere, and considers that the greatest hope of improvement is in the observation of atmospheric electricity.—The storms of India, by S. M. Ballou. The storms are divided into three classes: (1) the cyclones that occur at the changes of the monsoons; (2) the storms of the summer rains; (3) the winter rains of the northern provinces; he discusses the causes of their formation, and gives a brief description of each of these classes.—The ether and its relation to the aurora, by E. A. Beals. The author gives a brief summary of some of the facts respecting our knowledge of auroras, in view of their probable maximum during the coming year in connection with their correlation with frequency of sunspots.—There are also short articles on warm and cold seasons, by H. Gawthrop; facts about rain-making, by G. E. Curtis; and convectional whirls, by Prof. H. A. Hazen.

SOCIETIES AND ACADEMIES.

LONDON.

Anthropological Institute, October 18.—A special meeting was held, the president, Edward B. Tylor, D.C.L., F.R.S., in the chair, to receive a communication from Major R. C. Temple, I.S.C., on "Developments in Buddhist Architecture and Symbolism as illustrated by the Author's Recent Exploration of Caves in Burma." Major Temple commenced by saying that the object of the paper was chiefly to draw attention to the extraordinarily rich and for the present practically untouched field for the ethnographer and antiquary existing in Burma. He exhibited some photographs of life-size figures in wood, carved by a well-known artist of Maulmain, of the "four sights" shown to Buddha as Prince Siddhartha on his first visits to the outer world, viz., the old man, the sick man, the dead man; and the priest; and also some admirable gilt wooden representations from Rangoon of Buddha in his standing and recumbent postures, with his begging bowl, and seated as King Jambupati, surrounded by priests and other worshippers. He next showed a remarkable set of gilt wooden images from the platform of the great Shwedagon pagoda at Rangoon, of *nats*, *belus*, *hanuman myauks*, and other spirits believed in by the Burmese, seated on the steps of a lofty *tagon-dain*, or post, on the top of which is always perched the figure of the henth (hansu), or sacred goose, which apparently protects pagodas in some way. From these he passed on to four representations of large glazed bricks or tiles from Pegu. These curious, and (so far as English museums are concerned) probably unique antiquities may be presumed to be at least 400 years old, and formed at one time the ornamentation of the three procession paths round a now completely ruined pagoda. They represent the march, battle, and flight of some foreign army, represented in true Indian fashion with elephant, monkey, and other animal faces. Some of the figures are clad in Siamese and Cambodian fashion. The glazing is remarkably good, and Indian influence is clear in their construction. They may probably represent a scene from the *Ramayana*, which in a mutilated form is well known to Burmese mythology. These were followed by a huge figure of Buddha from Pegu, in his recumbent attitude, which may be referred to King Dhammacheti, who flourished in the fifteenth century. This image is 181 feet long and 46 feet high at the shoulder. It is built of brick, and is well proportioned throughout. Its history is lost, and so was the image itself until 1881. Pegu was utterly destroyed about 1760 by the Burmese,