

SIR HARRY JOHNSTON'S EXPLORATIONS IN UGANDA AND CENTRAL AFRICA.

BY THE LONDON CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

The feature of the opening meeting in London of the winter's session of the Royal Geographical Society of Great Britain was Sir Harry Johnston's lecture on "The Uganda Protectorate, Ruwenzori, and the Semliki Forest." Sir Harry Johnston is the residential Commissioner for the British government in Uganda, and in the course of his official duties he thoroughly explored the Protectorate and the surrounding country, gained some valuable information, and made several important discoveries of scientific interest. Since his return to England, Sir Harry Johnston has refrained from divulging any information regarding his researches, with the exception of the okapi, until the results of his work had been thoroughly investigated by the leading scientists and explorers. Consequently, special interest was evinced in his address to the Royal Geographical Society.

Sir Harry Johnston, in his lecture, took the Uganda Protectorate province by province, and gave original information about each province in turn. The provinces are six in number—Eastern, Rudolph, Central, Nile, Kingdom of Uganda, and Western. The traveler from Mombasa, before reaching the frontier of Uganda, passes through the country of Kikuyu, which is well forested and thickly clothed with vegetation. As he descends into the Rift Valley, the Kikuyu vegetation decreases in luxuriance. In the vicinity of Lake Naivasha there is a short sweet grass, which is probably kept low by the browsing of innumerable antelopes and the herds of Masai cattle. The Masai of the Naivasha district belong to the essentially cattle-keeping, semi-nomad division of that race. Quite recently, for political reasons, it had been thought advisable to make the Masai dwelling within the eastern province of the Uganda Protectorate independent of any political connection with those of the adjoining East Africa Protectorate or of German East Africa. Unfortunately, at the present moment, the Masai race is on the road toward extinction, either by dying out or by fusion with other tribes. During the last year or so, however, there has been a marked increase in prosperity among the Masai of Naivasha, and it is hoped that in this region they will increase, multiply, and preserve the purity of race. From the northeastern buttresses of Mount Elgon, and the headwaters of the Weiwei River on the north, to the frontier of German East Africa on the south—a distance of about 240 miles—extends, at altitudes ranging between 5,000 feet and 10,000 feet, one of the most beautiful and healthful districts to be found anywhere in the Dark Continent. This lofty region Sir Harry Johnston has styled the Nandi plateau, as it is mainly inhabited, at present, by races of the Nandi stock. This beautiful land has not in it a single ugly or unfriendly spot, and as it is almost entirely without native inhabitants, it seems to be waiting the advent of another race to make it a wonderland of wealth and comfort. It is situated exactly under the equator, at an average altitude of 4,000 feet above the Victoria Nyanza.

Sir Harry Johnston traveled completely round Mount Elgon. On its southern as on its northern side, the awful mountain cliffs which mark one of the lower terraces of this tremendous crater are honeycombed with deep recesses or caverns. These are the well-known caves of Elgon, the caves which were first discovered by Joseph Thomson. Sir Harry Johnston visited several caverns, including the one which was the first cave reached and discovered by Joseph Thomson, whose visit the natives still remembered vividly. This cave is marked by a splendid waterfall. It was the descent of the Sasuru River, and he named it the Thomson Falls. Joseph Thomson left behind him here, as wherever else he passed in Central Africa, the most pleasing memories. As if by fate, Sir Harry Johnston often traveled in Thomson's footsteps, and he always noted that where Thomson had been, the first white pioneer, his admirable treatment of the natives had insured a kindly welcome to those who followed. The native inhabitants of West Elgon were of the greatest interest. They were of rather a mixed stock, but all were of very low and ape-like appearance. The greatest interest they possessed lay in the fact that they spoke a Bantu language, which, of all those discovered, possibly came nearest to the original form of the Bantu mother tongue.

From the Sabei country, he was obliged to travel for sixteen days to the ravine station without a road, simply guiding his caravan by the map and eye. From the northeast of Elgon to within sight of the ravine station, he passed through a land whose only human inhabitants were a few wandering and fugitive Andorobo—a land simply swarming with big game. The caravan saw large herds of elephants first, then many rhinoceroses, then literally countless hartbeests, water buck, reed buck, Cobus antelopes, bustard hartbeests, and oribi. Herds of zebras would follow the caravan,

snorting and kicking up their heels. There were lions, leopards, warthogs, jackals, and many ostriches. Last of all, in the middle of the Gwas'Ngishu plateau, where forests of acacia still lingered, the expedition encountered giraffes, some with five horns appearing to be a new species of that remarkable animal, and seemingly the common form of giraffe between Elgon on the west and Lake Baringo on the east. Seen from a distance, these giraffe, when full grown, appeared to be black, but to have white bellies and limbs. Here and there monsters stood on the tops of large anthills or small hillocks, sentries posted to warn the feeding herds of the approach of the giraffe's only enemies, man and the lion. Yet so little had man harassed these creatures during recent years, since the plateau was divested of its human inhabitants, the Gwas'Ngishu Masai, by civil wars, that these sentinels took little or no notice of the caravan. Four specimens were secured—two males and two females—for the British Museum. Sir Harry Johnston crossed the Semliki River opposite Fort Mbeni, and traveled for three days in the dense Congo forest. He fully indorsed all that Stanley had said about the awesome nature of these appalling woods. He employed his time in this forest by visiting the Pygmies at home, and seeing their little settlements of tiny huts constructed of withes and leaves. He also encountered the strange, prognathous, ape-like people, who seemed to be a race of pariahs dwelling on the fringe of other tribes; and he ascertained that the real gorilla comes pretty near to the Semliki in its distribution. He was of the opinion that other remarkable discoveries of hitherto unknown mammals were to be made in this huge forest, besides that of the okapi. As it was, skins of several other beasts new to science were obtained. The natives everywhere were found to be on friendly terms with the Belgian authorities, and the excellent roads and well-built stations, together with abundant supplies of the comforts and necessities of existence from Antwerp merchants, introduced a strange element of civilization into these otherwise trackless wilds.

The southwestern part of the Uganda Protectorate consists of the district of Ankole. A portion of this noble country rises to heights of 8,000 feet and 9,000 feet, and here reappears the Alpine vegetation of Ruwenzori, Elgon, and the Nandi plateau. Among these mountains are scattered almost innumerable crater-lakes, which provide landscapes of exquisite beauty. They nearly all contain fish. The scenery round these crater-lakes is so extravagantly beautiful that, coupled with the fact that they were in a country possessing a very healthy climate and few inhabitants, they might some time become the seats of small European settlements. The northern part of Ankole is somewhat drier and less equatorial in climate. It has a more parched appearance, at any rate during the dry season, and is of lower altitude. Here there is a certain amount of big game, including buffalo, rhinoceros, and eland. The people of Ankole consist of a race of sturdy negroes—the Ba-iro—and an aristocracy of Ba-hima, who are obviously descended from a Gala, Somali, or other Hamitic stock. As regards features and complexion, men and women were often seen among the Ba-hima who were more like Egyptians than was the case with the Galas and the Somalis. But strange to say, the hair of the head is much more woolly and negro-like than is the case with Galas and Somalis. Some men and women were so light in complexion that Sir Harry Johnston thought they were some of Emin Pasha's refugee Egyptians, until it was proved to him that they had been born and bred in Ankole. These people, no doubt, were the origin of many of the legends of a white race dwelling in equatorial Africa. Among other points they were remarkable for their domestic cattle, which had more or less straight backs, were of large size, and had enormous horns. On the whole, the breed agreed remarkably closely with the long-horned cattle depicted in the Egyptian frescoes, and the explorer believed that this race was the stock from which the long-horned South African cattle were derived. Sir Harry Johnston also described his explorations of the Ruwenzori range of snow mountains, which remain still the most mysterious and least known mountains in Africa. In his opinion this is, certainly, of all African mountains of his acquaintance, that which is the most constantly cloud-covered. The explorer is convinced that the highest point of Ruwenzori is not under 20,000 feet in altitude, and that it would therefore be found to be the highest mountain on the continent of Africa. When, after the most arduous climb he had ever experienced, his highest point was reached on the flanks of the snow range—14,800 feet—the mountain above him seemed a thing he had only begun to climb, and towered, as far as he could estimate, another 6,000 feet, into the dark blue heavens. Perpetual snow, however, lay as low as 13,000 feet. To effect a complete and successful ascent of the highest points of Ruwenzori required as elaborate a preparation as the exploration of the

Andes or the Himalayas. An enormous deal remained to be done in the exploration of this, the most important range of Africa.

In the course of his lecture Sir Harry Johnston reproduced, by means of the phonograph, records of many of the native songs of Uganda, utilized in their war dances, festivals, and orgies, as well as many of the dialects of the various tribes he met in the course of his journeys.

SCIENCE NOTES.

George K. Cherrie, curator of the Brooklyn Museum, sailed early in September on an expedition into South America in search of specimens of butterflies and mammals. He was accompanied by Benjamin Gault of Chicago, who will scan the same country in the interest of the Field Columbian Museum for relics of the prehistoric ages.

The largest pair of animal tusks ever found in the frozen North have arrived in Seattle from Keenwalk, a mining camp 300 miles northwest of Nome, well within the Arctic circle. The remains of the animal were found by M. F. Moran, the postmaster of Keenwalk, and will be forwarded to the Smithsonian Institution. The tusks are twelve feet from end to end. One weighs 168 and the other 172 pounds. Both are in an excellent state of preservation, the ivory being perfectly sound and of fine quality.

In order to give the British Association a free trip to Central Africa, the British South Africa Company will spend \$35,000. The next meeting of the Association will, therefore, be held in 1905 at the Victoria Falls on the Zambesi River. Not far from Victoria Falls, Livingstone found the only indication of coal so far discovered in tropical Africa. Day by day the railway from Cape-town and Bulawayo is drawing nearer to Victoria Falls, where the South Africa Company will soon turn the enormous water power available, into electricity. A hotel is to be built for the accommodation of the British scientists.

Before the British Association, Dr. W. E. Wilson, F. R. S., briefly described a new bolometer of his which would be very valuable for cloud observations. The bolometer is not simple. It consists of two coiled and blackened platinum wires, contained in a tube from which air is exhausted. The tube is driven by a clock-train which runs for a week. The one coil is exposed to the sunlight, the other kept in the shade. The new instrument is reported superior to others of the Callendar type, previously employed. The calibration of the instrument is effected with the aid of an electric current which heats one of the bolometer strips.

Dr. G. H. Bryan has raised the question of the escape of light gases from planetary atmospheres. The question was suggested by the apparent absence of helium and also of hydrogen from our atmosphere, and the apparent want of a lunar atmosphere, and is exceedingly difficult to deal with; many assumptions have to be made, for instance, as to the temperature of the outer layer of our atmosphere. Prof. Bryan now comes to the conclusion that helium and hydrogen might escape at negligible rates if the mean probable velocity were ten times as large as we assume it to be at ordinary temperatures. In reality there is probably only diffusion of the light gases into the higher strata. Prof. Bryan offered figures as to the amount of hydrogen we should have to generate to keep the quantity of atmospheric hydrogen constant, supposing that it were one of its constituents. Asked whether these two gases would still be in our atmosphere if they had been there when the earth was at high temperature, Prof. Bryan replied that that was a far wider and very difficult problem, since mass would in that period have been much more diffused than now.

THE RAISING OF A BIG RAILWAY BRIDGE.

On January 5 the huge Pennsylvania Railway bridge crossing the Passaic River at Newark was raised. The steel structure was divided into three parts, two of which were first lifted 13 feet above their former level, whereupon the raising of the third part began. The work was accomplished by nightfall of the same day. The reason for the lifting of the bridge is to be found in the fact that the tracks through Newark are elevated. A second bridge crossing the Passaic, and used by local and freight trains ordinarily, is now in use for all traffic until the main bridge is raised to the height of the track elevation and is made safe for travel.

An electric dynamo which had been installed in the Yale & Towne Works at Stamford, Conn., burst on January 3, while it was being tested. At the time of the accident the machine was making 3,600 revolutions per minute and had been running at top speed for ten minutes. Although there were six or eight men in the dynamo room at the time, and huge fragments weighing from 200 to 300 pounds were scattered about, no one was injured. The windows and wood-work, however, were badly damaged.