

comparison was made between the thermograph and a thermopile of forty-eight couples, the result being that the former was found about twelve times as sensitive as the latter. Measures of the radiating power of some rocks, mostly of volcanic origin, show a remarkable uniformity. If the radiation from a blackened surface of quartz be taken as 100, the lowest radiating power is possessed by common white pumice, and is represented by 71·3. The temperature at which the measures were made was near 100° C. The measures of lunar radiation were made with an arrangement similar to that of a Herschel's telescope with the thermograph in place of an eye-piece. The results of the experiments indicate that the heat which our planet receives from the moon is to that of the sun as 1 is to 184,560. Some observations were made during the lunar eclipse of January 28, 1888, for the purpose of determining whether our atmosphere allowed radiations from the heated lunar surface to pass through it. When the moon was in the penumbra, the reading of the galvanometer scale was 254·4, nineteen minutes before totality it was 11·2, eight minutes before totality it was 7·3, and the mean of thirty readings taken during the total phase gave the value 2·09. The inference drawn from these observations is, that all but a minute portion of the rays from the lunar soil and rock are cut off by our atmosphere, for it seems impossible to conceive that a surface like that of the moon, upon which the sun has been shining for many days, should suddenly cease to radiate when the sun's light is withdrawn. A comparison of lunar rays with solar rays reflected from various rocks shows that the selective absorption by the rocks is altogether insufficient to explain the great absorption of the lunar rays observed during the eclipse. An attempt has been made to construct a curve representing the change of transmission of lunar rays by our atmosphere with changes in the altitude of the moon. The measures show that our atmosphere, at the ordinary pressure, transmits 89·25 per cent. of the vertical lunar beam.

THE STAR D.M. + 33° 470.—The Rev. T. E. Espin announces, in *Wolsingham Observatory Circular*, No. 27, that this star (R.A. 11h. 28m. 16s., Decl. +33° 38', 1855), magnitude 9·2, was observed on November 7 as 7·5 magnitude. Hence the star is probably variable. The spectrum is that of Group II.

THE NYASSALAND REGION.

ON Tuesday evening, at the opening meeting of the new session of the Royal Geographical Society, Mr. H. H. Johnston read a paper on his recent visit to the region lying between Lakes Nyassa and Tanganyika. While Mr. Johnston dealt largely with matters bearing on British interests and the industrial development of the region, he was also able to make additions to our knowledge of its geography. Mr. Johnston, in H.M.S. *Stork*, sailed up the Chindé mouth of the Zambesi, and for some distance up the Shiré River, where he was transferred to the Lakes Company's steamer *James Stevenson*. He visited the well-known station at Blantyre, then sailed up the lake to Karonga, the British station on the north-west shore of the lake. After bringing the hostile Arabs to terms, Mr. Johnston went on across the plateau to the south end of Lake Tanganyika, visiting, by the way, Lake Hikwa or Rukwa, first seen by Mr. Joseph Thomson on his first expedition into Africa. Of the navigation of the Zambesi, Mr. Johnston said:—

"The navigation of the Zambesi from its mouth to Vicente is by no means an easy matter to those unacquainted with the intricate windings of the river's navigable channel. The great stream, which is, on an average, three or four miles broad, is studded with islands and beset with sand-banks. Vast stretches of the river are covered by scarcely more than six inches of water. To the eye of a man accustomed to the study of great rivers, the existence of these shallows is at once apparent by the mirror-like calm of the water that covers them, and the warm, pinkish tone of the sandy bottom which subtly permeates the blue reflections of the sky. On the other hand, the course of the deep channel is marked by the swirling water, the tiny whirlpools, and the sharply-cut sides of the bank, which, instead of tapering off into the stream, look as if they had been recently sliced with a large knife. There is a crying need for what at present does not exist, or, if it does, is not known to the outside world—a good, accurate, and detailed chart of the course of the Lower Zambesi. Although the course of the

deep channel varies and alters, as it does in all great rivers, it does not generally change so quickly but that a little careful supervision might easily keep such a chart up to date."

The following account of what is to be seen on the Shiré is of interest:—

"Continuing the ascent of the Shiré, we skirt the strikingly picturesque range of the Pinda Mountains, all jagged peaks and sugar-loaves, on the east, and the Matunda Mountains on the west, while in the far, far distance northwards there rise the vast dim outlines of higher and higher peaks, culminating in Mount Tshiperoni (or 'Clarendon,' as it was named by Livingstone). The scenery on this stretch of the Shiré is really very fine. In the foreground there are the serpentine windings of the broad river through the great Morambala marsh, which is here and there dotted by little lakelets of clear blue water, but for the most part covered with wide stretches of tall reeds. These reeds bear large heads of creamy-white flower-tufts, almost as big as those of the pampas grass, and as the wind blows across the marsh it sways the reeds into wave-like undulations, wherein the great white heads of blossom appear like fluctuating foam cresting the billows of shining green leaf-blades beneath. Rising above this white-flecked sea of glistening grass are the abrupt ranges of fantastically-shaped hills and mountains, which girdle in the Shiré valley with great semicircles of blue mountain wall. Occasionally a glaucous-green Borassus fan-palm rises on a column-like stem from an island in the river or a dry patch in the marsh. These landscapes are drawn in large traits, and their harmonies are simple, and not complicated by the admixture of any human habitation or cultivation. It is not until one is within a relatively short distance of the Ruo that the banks of the Shiré begin to be inhabited again, and the marsh yields to thin forest and plantations of maize, tobacco, millet, and pumpkins.

"A short distance above the Ruo one enters the Elephant Marsh, a district of great grassy flats, flooded occasionally when the Shire overflows its banks, but ordinarily a dry level stretch of prairie dotted with pools of water.

"At the close of the dry season, when the tall grass has been burnt down, and there is little or no cover for the game to hide in, it is really a remarkable spectacle, as seen from the deck of a steamer, to watch the great herds of big animals wandering over these savannahs in search of the young verdure springing up amid the charred stubble of the old grass. With an opera-glass you may distinguish water-buck, gnu, buffalo, eland, pallah, reed-buck, and zebra, and occasionally some dark blue-grey blobs, much larger than the other specks and forms which are in their vicinity, turn out to be elephants. Occasionally a lion has been known to come down to the river and stare at the steamer, and on one or two occasions these beasts have actually been shot from the deck in passing. Both in the Elephant and Morambala marshes, and in the Upper Shiré, the hippopotamuses are a real source of danger and inconvenience to any boats of ordinary size which are not propelled by steam. The hippopotamuses are particularly dangerous at night, but even during the day they will deliberately chase and endeavour to upset boats and canoes which enter their domain; and in the development of the Shiré navigation it is essential that the hippopotamuses should be mercifully exterminated."

Mr. Johnston described as follows the fine country on the north of Lake Nyassa:—

"Here there are no fewer than nine perennial rivers, some of them of considerable volume, which descend from the lofty mountain ranges of Buntali, Wukukwe, and Ukinga, and enter the lake between Karonga and Parumbira Bay, the moisture which percolates from them through the soil giving the Konde plain an appearance of perpetual spring. The land at the north end of the lake is a veritable African Arcadia. You may walk for miles and miles through banana plantations; then you may emerge on wide-stretching fields of maize and millet and cassava. All the oozy water-meadows are planted with rice; but, above all, the great wealth of the country is in cattle, which, elsewhere by no means common in Nyassaland, thrive remarkably in the Konde district, and consequently milk and beef are cheap and abundant. The inhabitants of this happy land are a contented, pleasant-dispositioned folk, who knew no trouble until the Arabs sought to subdue them a few years ago."

From a geographical point of view probably the most interesting part of his paper was that describing his visit to the remarkably desolate region around Lake Rukwa lying on the south-east of Lake Tanganyika. Rising from the fertile plateau are the

Wungu Mountains, some 6000 feet high, and Mr. Johnston thus described what he saw on ascending them:—

“We looked down on what I thought at first was a very broad sheet of water, surrounded on three sides by high ranges of mountains. But by degrees, with the aid of a field-glass, I discovered that what appeared to be a spacious lake in reality consisted of a narrow contorted strip of water on the one side, and between us and the water a wide extent of absolutely flat plain, so uniformly covered with blue-grey forest that from those heights above it was hard to distinguish it by its colouring from the real lake. When I had taken a number of angles from our camp on the mountain crest, we began a most arduous descent from the heights into the plain below. As we descended, our impressions and forebodings became of a somewhat dismal character. Everything around us bore witness to the dearth of water. On the other side of the mountain range we had left a country in the fully beauty of spring, intensely green with the gentle showers of the commencing rainy season, but here on the slope facing Rukwa, the farther we descended the more arid the country became. At the base of the mountains we crossed a three-mile stretch of level plateau, covered with the dismal grey growth of innumerable thorn-trees, so gnarled and contorted in shape, and provided with such cruelly ingenious hooks and barbs and stiletto-like thorns, that they might have been the enchanted forest round some wizard's lair.

“This plateau came to a sudden and abrupt termination, and from its edge we made a precipitous descent along a blood-red path into a blood-red ravine, the sides of which were fantastically planted and festooned with clumps of purple-green aloes, and those weird candelabra euphorbias with grey spectral stems, the segmented stalks of which looked like the tails of innumerable scorpions. Down through the dark gloomy depths of this cleft of the earth we floundered, slipped, and fell into the gorge of a dry river, cut deeply in a winding channel between precipitous red walls, the sides of which were scoured and polished and striated as if by glacial action. There were scattered stagnant pools of water in the red, red rocks and sand, and water oozed from places in the river bed when our porters dug below the surface. The trees clinging to the sides of the ravine were emerald green, with a metallic-tinted harsh verdure. Evidently this dried-up stream had once been an important river and a powerful torrent, and nothing is more remarkable in the vicinity of Rukwa than to observe the traces of a once abundant rain supply, which, from some unexplained cause, has—so the natives say—suddenly ceased during the last two or three years, as though the country had been literally blasted by some terrible curse.

“Crossing the dry bed of this river we entered on another level stretch of country gently sloping northwards, its surface uniformly clad with a forest of grey thorn-trees, but with the ground at their bases bespangled in a strange contrast with gorgeous flowers, which were almost unaccompanied by leaves, just the vividly-coloured petals rising from the hard grey soil.

“These consisted chiefly of purple, yellow, and white anemones, arborescent lilies, with white star-like flowers springing from a grey branching stem, and great heads of pink crinums resembling the ‘kafir lily’ of South Africa.

“We passed an occasional dry water-course choked with grey-green life-in-death vegetation, and then at length reached a broader dried-up stream-valley, with shadier trees and a stockaded village, the first we had met with in the land. . . . As soon as we got out of the broad, shaded stream-valley where the village was situated, we entered the frying, blazing heat of the parched plain, and found ourselves in a white, light, bright hell of dazzling sunshine. The shadeless acacias with their cruel thorns, the dry yellow grass, and the yellow withered *Borassus* palms, in no way mitigated the pitiless glare of the vertical sun, while a raging wind, hot as the breath of a furnace, swept over the plain and burnt the skin of our faces, so that we felt as if we wore tight masks. Every quarter of an hour the wretched caravan had perforce to stop and pant under the thin film of shade which might descend from the skeleton branches of a dead tree. At length, after frequent halts and protestations from the sun-stricken men that they could go no farther, we saw ahead of us an emerald-green line in the grey wilderness, which marked the presence of water. This turned out to be a welling, brackish pool thronged with bulrushes and reeds, a kind of circular spring of overflowing water apparently connected with the lake by a long lane of rush-choked marsh, very distinct from the arid plains of baked mud. We camped here, where the scenery

was a little less ghastly in its dead ugliness. The acacias exhibited a little green foliage among their thorns, and they were frequented by thousands of cooing doves, while the scanty bushes on the ground served as cover for many francolin and guinea-fowl. Game, in the shape of antelopes and buffaloes, was evidently abundant, and no doubt was attracted to the vicinity of this brackish pool by the flakes of salt which remained on the soil where the water had evaporated; and the game in its turn was followed by hyenas, lions, and vultures. The hyenas laughed and the lions roared outside our camp fires, and the next day I noticed many scattered fragments of bones and skulls in the vicinity, which were the relics of previous feasts on the part of these Carnivora.

“I was anxious to proceed direct to the lake from here, as we were only about three or four miles distant, but the Wungu people would not allow us to do so until we had first seen their Sultan, so we travelled in a north-easterly direction, always through this scorching, glaring wilderness, till we reached the bank of the Soŋwe River. Here I camped so that the men might be close to fresh water, but it appeared to us that even the water of the Soŋwe was brackish, though it was a running river. It seemed to have no effect in quenching one's thirst, and contained some irritating property which occasioned diarrhoea, and even dysentery. Leaving my men at the Soŋwe, I went with Mr. Nicoll and Dr. Cross to visit Mwinyi-Wuŋgu, who lived about a mile from its banks in a stockaded town. I can hardly describe the heat of the atmosphere in walking thither; it was like passing through fire. When we got into the town, we eagerly crept under the shade of the overhanging eaves of the houses, which extended so near the ground, for the sake of coolness, that one had to get down on all fours to get under them.”

As there was really a famine both of food and water in this dreadful wilderness, Mr. Johnston and his large party of men were compelled to hasten out of it, without his actually being able to get to the edge of the lake itself. What he has told us about this region makes us desirous of knowing more. It is a remarkable fact that, while in the Nyassa-Tanganyika plateau there had been no lack of rain, in the lake basin itself not a drop had fallen for three years.

THE BOTANICAL MYTHOLOGY OF THE HINDOOS.

AT a recent meeting of the Anthropological Society of Bombay, Dr. Dymoke read a very interesting paper entitled “The Flowers of the Hindoo Poets,” in the course of which he referred to the mythical conceptions which have gathered round trees and plants in the minds of the Hindoos. The ancient Eastern poets saw in the tree a similitude with the heavens and with the human form; in the “*Gitagovinda*” a comparison is drawn between the clouds and the thick dark foliage of the *Tamala*. These fancies gave rise to the numerous poetical myths concerning the tree of life, of knowledge, of the *Amrita* or *Ambrosia*, as well as those concerning cosmogonic and anthropogonic trees. The *Soma* or *Amrita* is represented as the king of plants, the eternal essence which constantly sustains and renews the life of plants and animals; it is the symbolical drinking of this eternal essence as a holy ceremony to which constant allusion is made in the Vedas:—

“We've quaffed the Soma bright,
And are immortal grown;
We've entered into light,
And all the gods have known.”

—*Rigveda*, viii.

The *Amrita* appears in various forms in stories and legends. A famous poet says that the drop (*Svedavindu*) which fell into the shell became a pearl; in the mouth of the black snake it became poison; and in the flower of the plantain, nectar. Several plants bear this name, and are supposed to be endued with an extra particle of the eternal essence; among others, the *Nem*, on which account the Hindoos, on their New Year's Day, eat the leaves of this tree upon the supposition that the *Amrita* contained in them will insure longevity. In Hindoo flower lore the large black bee (*Buramara*) plays an important part: he is the inconstant lover who delights in gathering sweets from every flower. The queen of Indian flowers is the lotus: the Hindoos compare the newly-created world to a lotus flower floating upon the waters, and it thus becomes symbolical of