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EDITED BY DR. NORTON SHAW.

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but the old mine of S. Rosario is still the richest of all. The advent of Mr. Sevin's party created quite a sensation, for the want of a new element to elevate the population from its present miserable condition is severely felt among all classes in Mexico, and Mr. Sevin feels assured that energetic foreigners, with a bonâ fide purpose of trade and industry, would be cordially welcomed by the natives. His next point was Huacaybo, in reaching which he passed the famous mines of Jesus Maria, which are now worked in a most desultory manner by mining squatters; the richest of them is flooded with water. The copper lode at Huacaybo appears to be on an immense scale, and its position and capabilities are minutely described. At this point Mr. Sevin turned back; his mules were lamed, his stock of provisions and necessary luxuries were consumed, and he went back to Mazatlan by another route.

He reports on numerous mining districts, Bastoseâgochic, Sentrion, Cerocâhuic, Monterde, Guadalupe el Calvo, El Parral, Hydalgo, San Diego, and Santa Eulalia. In the immediate neighbourhood of the last of these more than 250 mines have been worked, 50 of which are more than 200 yards deep and remarkably extensive, but the working of all of them has been checked since the expulsion of the Spaniards. He then passed to Batopilas; and, after visiting another group of mining districts as numerous as the last, and all of which are minutely described in Mr. Sevin's paper, that gentleman and his companions reached Mazatlan in November.

Mr. Sevin finds great fault with the cartography of the country he saw:—"As for the different rivers, mountains, and villages laid down in the different English and Spanish maps known to me, I have not seen one in which their geographical position was in accordance with my daily observations, and where the names of the localities were rightly spelled."

The paper concludes with a minute description of the physical geography of Chihuahua.

The PRESIDENT.—Geographers must be well pleased to know that a gentleman going to remote parts of Mexico without any mission to carry out our special objects, has of his own accord, and at his own expense, devoted so much labour and talent in laying before us a picture of a country, some parts of which have been visited by various British miners, but of which we have not yet had so clear a general sketch. The journey was not performed without difficulty; fire-arms having to be employed occasionally in those parts where the road was beset by robbers. We have, indeed, every reason to thank Mr. Sevin for having so successfully accomplished the object of his travels, and for having made the remote parts of Mexico much better known to us.

MR. J. CRAWFORD, F.R.G.S.—Mr. Sevin, perhaps, will have the goodness to give us some estimate of the amount of silver produced within the republic of Mexico. At the same time I would ask him, has the price of quicksilver

greatly diminished? Since the discovery of the quicksilver mines of California, I understand that the amount of silver produced every year depends almost entirely upon the price of quicksilver.

MR. SEVIN.—It is impossible to state what amount of silver is found in Mexico, because the silver is exported in dollars, and also in bars, which are smuggled out of the country in great quantities; the exportation of silver in bars is altogether prohibited by law—therefore no exact statistics can be drawn up of the actual produce and exports of silver. In the republic of Mexico, in the year 1856, when I was there, there were thirty-five millions of dollars coined. By comparing statements, it appears that the silver coined in former years did not amount to so much; but whether it is larger this year than last, I cannot tell. With respect to the price of quicksilver ten years back, it was one dollar and a-half in California, and two dollars in Mexico. Now, the price is about half a dollar in California; but at present the mines are involved in a law-suit, and the price will rise if the American Government should lay an injunction upon the working of the mines.

The second Paper read was—

2. *Extracts from Reports by Captains BURTON and SPEKE, of the East African Expedition, on their discovery of Lake Ujji, &c., in Central Africa.*

Unyanyembe, Central Africa, 24th June, 1858.

SIR,—I have the honour to transmit, for the information of the Royal Geographical Society, a copy of a field-book, with a map by Captain Speke. The details contained in the map render all remarks upon the country superfluous until we may be able to communicate them in person.

We left the Lake of Ujji about a month ago, and are now halted at this main depôt of Arab trade. Captain Speke has volunteered, when he and the rest of the party are sufficiently recovered from their present state of universal sickness, to visit the Ukerewe Lake, of which the Arabs give grand accounts. It lies nearly due north of Unyanyembe, at a distance of from 12 to 15 marches. Thus we shall be enabled to bring home authentic details of the four great waters which drain Eastern and Central Africa, viz. the Nyassa, the Chama, the Ujji lake, and the Ukerewe. On Captain Speke's return, we shall lose no time in repairing to the coast, which, if we pass safely through perilous Ugogo, we may hope (D.V.) to reach about December of this year.

We have both suffered severely from illness. We were compelled to travel from Unyanyembe to Ujji during the wet monsoon, and in the same season to embark in open canoes, exposed to wind and rain, sun and dew, and, when on shore, sleeping in mud to explore the lake—a labor of about a month. During this time we endured great hardships and ran not a few risks. Our limits of the lake were laid down by the accounts of the tribes.

We are slowly improving, and the thought of finishing our labors with what we hope will be considered most valuable results has much diminished the terrible wear and tear of mind caused by wants during our journey westwards. Our asses, 30 in number, ALL died; our porters ran away; our goods were left behind; our black escort became so unmanageable as to require dismissal; the weakness of our party invited attacks, and our wretched Balochi deserted us in the jungle, and throughout have occasioned an infinity of trouble.

We deeply regret that the arrangements for the expedition were not upon a more liberal scale. With 5000*l.* we might, I believe, without difficulty, have spanned Africa from east to west. However, the similarity of the two coasts and the accounts of travellers who have penetrated the western regions lead to the conclusion that the other half of the great continent just reflects the portions of which we hope to lay before you exactest details.

H. M. the Prince "Majid," and his native and Indian officials, have taken the greatest interest in our progress, and we have reason to be truly grateful to them. They were also urged on by the Consul de France, M. Ladislas Cochet, who, after Lieut.-Colonel Hamerton's unfortunate decease, has proved himself an active and energetic friend.

Your most obedient servant,

RICHD. F. BURTON, Captain Bombay Army,
Commanding E. A. Expedition.

To Dr. Norton Shaw.

Unyanyembe, 2nd July, 1858.

SIR,—I have the honour to request you will lay the accompanying map and field-book before the President and Council of the Royal Geographical Society. I send a plan of the whole route, as far as we have gone, on a diminished scale, as it is a safer means of conveying our entire work to you than by sending portions at a time, as I have hitherto been obliged to do. My office-copy, of course, is kept on the original scale, or the same size as the four sheets I sent you from the 20th November, 1857.

Whilst at the Lake Ujiji, I paid a visit to Kasenge Island, in the hopes of procuring an Arab boat, and had then the opportunity of seeing those two points south of it, Ukungwe and Tembwe, on its east and west shores. I was informed that the sea broadened a good deal to the south of these points, and finally turned off with a tail to the west. The distance from Kabogo to Kasenge (across the

sea) I have set off from the compass-bearings, in conjunction with the latitudes; it makes a distance of about 23 miles: the time occupied in rowing was the same either way—11 hours incessant.

To diminish the disappointment, caused by the shortcoming of our cloth, in not seeing the whole of the sea Ujiji, I have proposed to take a flying trip to the Ukerowe lake, while Captain Burton prepares for our return homewards. This business must be done speedily, or the ponds and puddles drying up, will render our progress seawards difficult. The only instruments I shall take with me will be one sextant and horizon for latitudes, one compass, and one thermometer (boiling).

The year appears evenly divided into two seasons—wet and dry—each lasting six full months. We have fairly gone through six of wet, and now know nothing but sun and wind: both elements are very strong. This is a shocking country for sport; there appears to be literally nothing but elephants, and they, from constant hunting, are driven from the highways. All I have ever succeeded in shooting have been a few antelopes and guinea-fowls, besides hippopotami, near the coast.

I have the honour to be, Sir,

Your obedient Servant,

J. H. SPEKE, Captain Bengal Army.

To Dr. Norton Shaw.

The PRESIDENT.—We cannot but gratefully return our thanks to the gallant authors of these communications. Many of us are well acquainted with the previous remarkable exploits in foreign travel which Captain Burton has performed, and he is now associated with a man who seems to be his equal.

I beg to call your attention in a very few words to the remarkable journey that these adventurous men have made. We are not yet acquainted with all the scientific details, nor able to answer for the exact longitude and latitude of different places; for you have heard how the travellers have been exposed to dire illnesses, and have been rendered almost incapable of making observations. They estimate, however, the distance of the Lake Ujiji from the Eastern Ocean, or Zanzibar Coast, to be not less than 500 miles in a straight line. This progress into the interior of Africa, on so high a parallel, is a geographical feat second only to that which our illustrious friend Livingstone has performed. Their observations made in traversing this tract of country may lead us to doubt the approximate estimate made by the eye of the missionaries, who had seen very lofty mountains, on a more northern parallel, and which, though under the equator, were said to be covered with perpetual snow, and consequently at least 22,500 feet high. Upon these statements, it has been supposed that these mountains might be an extension of the Mountains of the Moon.

I call your attention to a section, now exhibited, representing the altitudes of the region which Burton and Speke have traversed. The highest point they ascended, as I understand from their observations, is not more than 3,500 feet above the level of the sea. Consequently, if the mountains seen and approached by the Missionaries on the north, should be found to occupy the lofty heights

assigned, they must subside from 22,500 feet to the low altitude of this, the leading coast range.

The lake which the travellers reached is stated to be 1800 feet only above the Eastern Ocean. This is *pro tanto* a corroboration of the speculation into which I entered in the year 1852, and which was first ascertained to be true by the important observations of Dr. Livingstone—that the interior of Africa is a great watery plateau occupied by different lakes, which send off rivers, which find their issue to the sea through gorges formed in the subtending coast ranges. The ridge traversed by Burton and Speke is, I presume, merely a continuation of the range of which Dr. Livingstone gave us such an admirable account, and which, in the country he examined on the parallel of the Zambesi, is simply a prolongation of the great coast ridge subtending that watery interior plateau to which I called your attention. God grant that Captain Speke may return from the hazardous expedition he is making to try and reach the more northerly and greater lake called Ukerewe. Hitherto there has been much mystery respecting the so-called interior sea, laid down under the name of Uniamesi, marked as 600 miles long, and represented as infinitely larger than the smaller lake of Ujiji. The northernmost lake of the two, lying as it does in a country of higher altitude, where the mountains reach, it is said, to heights of six or seven thousand feet, may after all prove to contain the chief sources of the Nile. We have, therefore, still before us for determination some of the most important problems that can engage the attention of geographers.

MR. M^QUEEN.—There is not much room for any observations regarding this route, except, perhaps, with reference to the position of the lake. The latter point is the only position that has been determined by astronomical observations. Every other position in the journey is fixed by bearings and estimated distances, and even those estimated under confessed difficulties. The lake I consider is too far to the west. You will remember that at the time Captains Burton and Speke were there, it was at the close of the wet season: they have given us no information of its depth, therefore we can form no idea how much it may diminish in the dry season. It may be that the whole is dried up. In a very curious account, the most curious I have ever seen, of the journey from the sea coast to the interior, to the coast of that lake, the Arabs stated that where they crossed the lake, it was twenty-four miles across—the distance now given. With respect to the position of the other lake, it will be found, should Captain Speke ever reach it, that it lies more to the east than west, and runs w.n.w. and e.s.e. The old maps of De Lisle, prepared by authority of the King of France 150 years ago, then the best, and even now good maps, show a large lake in the position indicated, with islands in it.

With regard to its connexion with the Nile, we need not, with the clear information we have, go there to ascertain that point. We have a clear and emphatic account of the Egyptian expedition sent by the late Mohammed Ali twenty years ago to explore the sources of the White Nile. The expedition reached 3° 22' N. latitude, in the meridian of Cairo, or about 31½° E. longitude. Where the last astronomical observation was made was in 3° 30' N. lat., and 31° 20' E. long. The general bearing of the river from thence to its source was given as s.e., distant *one month's journey*, or about 20 days, say 200 miles actual travelling. Its course upwards, from the point mentioned, was through high mountains, rising in height as these approached the Equator, and where around the source they rose far above the limit of perpetual snow. Dr. Krapf saw those mountains from the banks of the Dana to the east of them. The cold, he was told, was exceedingly severe, and from them ran a river northward to the country of the whites. The Egyptian expedition collected many particulars, deciding that in those parts were the sources of the White Nile, say in about 35° E. long., and 0° 30' N. lat. All accounts, ancient and modern, place high snowy mountains round the sources of the

western branch of the Nile. The river was then in 3° 30' N. lat., about 1370 feet broad, and falling very fast. Now I beg the President's attention to this fact. It was falling very fast on the 26th of January—so fast that the expedition did not venture to proceed any farther, for fear they should not be able to get back. The chief who resided there told them it would rise again in two months, at the end of March, which would exactly correspond with the sun coming to the north, becoming vertical near the equator. The river, therefore, can have no connexion with the lake, nor with any lake south of the equator, or it would not fall in the month of January: it would be rising at that time by the rains which fall from the beginning of November to the end of May.

With regard to the high lands spoken of, there cannot be the slightest doubt about it. The mountain must be at least 21,000 feet high to have three or four thousand feet of snow on the summit. It is utterly impossible an European could be mistaken, with his eyes, his ears, his feet, his hands, when crossing the base of the mountain, looking up to the top, and seeing the snow upon it. Mr. Rebmann saw the mountain in his second journey for weeks together. Two days before he reached Madjame, he encamped about 5 miles from it, in a cold almost insupportable. Even by moonlight he could clearly discern the snow. Next day he was not more than three miles from the summit, then traversing the lower part of the mountain over numerous defiles and chasms from 1500 to 2000 feet deep, with a great many streams of very cold water. Madjame is situated near the south-west base of the mountain. There, in the chief's residence, he saw the deep snow clad dome towering above him for days together. North-east of it, about 10 miles, is a lower mountain, which generally in the morning was *white with snow*, but which melted during the day. Mr. Rebmann took the bearing s.w., from the Taita hills. The distance from Mombas is at least 180 geographical miles. In two journeys from Mombas to Ukembane, Dr. Krapf in each saw the mountain daily for weeks together, and crossed rivers which descended from it. He could clearly discern and distinguish the snow from clouds which occasionally covered it. The height can hardly be less than 21,000 feet above the level of the sea; 17,000 feet above that level being the line of perpetual congelation, so near the equator, and immediately under it.

I also may observe with reference to the journey of Captains Burton and Speke, that they could not have travelled more than ten miles a day on the average. I am sorry that Speke is attempting to go away on an expedition to the north, for I think it is very doubtful whether he will ever reach this country again. I know something of the nature of tropical countries, and I cannot conceive anything so wild—his sad state of health considered, I think it is almost insanity—as this attempt to venture into an unknown country, perhaps worse than the country he has traversed.

With regard to the accounts given by the Arabs, I pay no attention to them; the Arabs make such gross mistakes about lakes of water. For instance, where rivers run into a lake, they often say they run out of it, and it requires great care and attention in examining their accounts in order to be correct.

I beg that it may not be supposed for a moment that I wish to under-rate in any way what Captains Burton and Speke have done. I have no hesitation in saying that theirs is the most correct route we have, but I think there are some parts of it that are not quite accurate, especially those portions on the first high lands from the sea coast.

To the west of the Kilimanjaro mountain, it was stated to the missionaries that there was a large lake, which flooded the country to a great extent during the rains, and when it receded left the whole country so covered with salt that it formed an article of trade in the interior. It was also stated that a large river ran into it from the north. With regard to the position of the lake in

question, it will be found considerably to the south of the equator, in 3° of south latitude.

MR. F. GALTON, F.R.G.S.—I trust I may be excused if I draw a conclusion adverse to the suggestion of some geographers upon the manner in which the discoveries before us affect the probability of Kilimanjaro and Kenia being of that remarkable height which the German missionaries, Messrs. Krapf, Rebmann, and Erhardt, have assigned to them. It must be recollected that in the view of these gentlemen Kilimanjaro and Kenia had no southern prolongations; they were in fact the southern abutments of a mountainous district, from whose feet an elevated plateau extended southwards with hardly a hill upon its face, but having a watershed on either hand. The only exception to this uniformity of surface consisted in the Ngu Mountains, which Mr. Erhardt had seen from the neighbourhood of Mboa-Maji, and which Captains Burton and Speke have crossed and described. It must further be recollected that the missionaries' assertion of an elevated plateau running parallel to the coast with an interior waterparting, was opposed to an opinion current among geographers of that day.

Now, Captains Burton and Speke have, as you well know, made two expeditions; the one in the latitude of Kilimanjaro, up the Pangani river, where they came among hills and experienced mists and chilly rains and a climate that was literally unendurable to the natives who had accompanied them from the heated coast. Here, then, were signs of a mountainous country, and although circumstances prevented them from penetrating far enough to be able to give any positive testimony, or even to collect information upon Kilimanjaro, I gather from Captain Burton's writings that their opinion was in no way opposed to the statements of the missionaries.

The second journey of Captains Burton and Speke was the present one. They started from the coast two hundred miles south of Kilimanjaro, exactly where the missionaries had assured them they would find no hills at all, except the before-mentioned one of Ngu, and that, precisely, was the only hill they found.

I therefore maintain that Captains Burton and Speke's discoveries, so far as they affect in any way the question of these mountains, lend considerable weight to the testimony of the missionaries; and I consider that we are even less justified now than we were before in denying the probability of Kilimanjaro and Kenia being capped with snow. I fear this much vexed question must remain at rest until some traveller can give us positive testimony.

CONSUL M'LEOD.—As every thing connected with that inland sea must be interesting, I would venture to state what I have already communicated to the Government, that, when at Mozambique, I learned from the Arabs that the river Conducia, which discharges itself into the north-west end of the harbour of Mozambique, takes its rise in a lake, which, in the rainy season, communicates with an inland sea, and that the sea takes three days to cross.

MR. M'QUEEN.—That lake that you allude to is the Lake Maravi.

THE PRESIDENT.—In endeavouring to give to the Society a general view of the efforts of our adventurous and gallant friends, I held it of some importance to call your attention to the fact, that whilst these supposed snowy mountains must be 22,500 feet high, if they really existed, under the equator, at all events they had no southern lofty prolongation; that in the parallel of Zanzibar the coast chain was low, and thus resembled the other coast ridges that subtend the interior of Southern Africa. The height of loftier mountains to the north, as Mr. Galton has properly stated to you, is still a matter for inquiry.

Leaving this point, however, to be determined by future explorations, let us advert alone to what our gallant countrymen have determined, and let us not mix up their exploits with our theories. The question now before us is, what

Captains Burton and Speke have done; and I repeat that they have confirmed the important observations of Livingstone—that the coast range that they traversed is much of the same height and composition as that which he traversed, and that like him they found in the interior that great water plateau, the existence of which he demonstrated.*

In concluding the business of this evening, I may announce that I no longer have any hesitation in addressing my associates as *Fellows* of the Royal Geographical Society. For, in consequence of the application which I made, by the authority of the Council, Her Majesty the Queen has been graciously pleased to grant us Her Charter, and the Royal Geographical Society is now, therefore, placed on the same footing as the older scientific bodies of the country.

Sixth Meeting, February 14th, 1859.

SIR RODERICK I. MURCHISON, PRESIDENT, in the Chair.

PRESENTATIONS.—*The Duke of Wellington; Captain E. M. Jones; Alderman Botterill, of Leeds; and T. H. Alsager, Joseph Mayer, J. Miland, M. H. Pasteur, L. E. R. Rees, W. C. Thomson, Arthur Vesey, and Theodore Watrond, Esqrs., were presented upon their election.*

ELECTIONS.—*Captain Andrew Clarke, R.E.; Lieut.-Colonel William Pottinger; Captain Louis Tindal, R.N.; Samuel Clarke, C.E.; C. Wentworth Dilke; Anthony L. Fisher, M.D.; and John W. Ogle, M.D., Esqrs., were elected Fellows.*

The Papers read were—

1. *On the "Aurora Borealis" in Greenland.* By J. W. TAYLER, Esq.

Communicated by Sir W. C. TREVELYAN, Bart., F.R.G.S.

THE fame of the Aurora's beauty is well known. Travellers in the Arctic regions have written pages describing its fairy brilliance—how it enlivens the frozen solitudes of the north, and makes kind amends for the lost sun. An extended series of observations of the aurora would doubtless be of great interest and service. The few following observations have been made in Greenland as a small instalment.

The distant glimmer of the aurora, as sometimes seen in our

* The Lake of Ujiji lies, according to the route-maps sent by Captains Burton and Speke, between the meridians of 26½° and 28° E. long. Its breadth, where crossed between Kabogo and Kasenge, is about 23 miles. From this, crossing to Uvira, near its north end, is 135 miles; the entire lake being 330 miles in length, between latitudes 3° 10' and 8° 30' S., and is there made to be about 700 miles from the eastern coast of Africa. Lake Ukerewe, south end, is estimated to be in about latitude 2° 40' S., longitude 31° 30'. But the observations for longitude, made by Captain Speke at Ujiji, on the E. shore of the lake, which have since been roughly computed by Mr. George, place it in longitude 30° 23' E. Should this position prove to be correct, the distance of the lake from the coast will be only 520 miles.—A. F.