The Anglo-French Niger-Chad Boundary Commission
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THE ANGLO-FRENCH NIGER-CHAD BOUNDARY COMMISSION.*

By Lieut.-Colonel G. S. McD. ELLIOT, R.E.

The work of the Boundary Commission that left England in October, 1902, was to ascertain on the spot where the frontier between the river Niger and Lake Chad, defined in the Anglo-French Convention of 1898, actually lay. The country through which this frontier passes was little known at the time of the signature of the Convention, so the delegates were forced to content themselves by defining it for the greater part in geometrical terms. Briefly it was this: Starting from the Niger 10 miles above Giris, it was to follow the median line of the depression known as the Dallul Mauri till this line intersected an arc of 100 miles' radius, with the town of Sokoto as centre. From this intersection point the arc itself was the boundary for about 300 miles, till to the north-east of Sokoto it cut for the second time the parallel of 14° N. lat. This parallel was to be followed for the next 70 miles, and then the meridian of longitude thus arrived at down to its meeting with the parallel of 13° 20′ N. lat., along which the frontier was to run for 250 miles, next a meridian of longitude from this point was to be followed north till the 14° N. was regained, and this again became the frontier till it intersected a third meridian of longitude lying out in Lake Chad, 35′ east of the centre of the town of Kukawa. This third meridian from this intersection point till it reached the southern shore of Lake Chad formed the last section of the boundary.

The line thus traced, though crossed in various parts, had not been followed for any distance by previous travellers. Denham, Clapperton, Oudney, Barth, Monteil, and others had between them visited Kuka,

* Read at the Royal Geographical Society, June 27, 1904. Map, p. 616.

Kano, Katsena, Sokoto, and Zinder; but the line of the frontier now under consideration, lying as it did in an uninteresting and sparsely inhabited country at the edge of the desert, was, naturally enough, not visited when so much that was interesting and important was little if at all known.

In 1900, Major Lang-Hyde, C.M.G., of the Royal Engineers, had surveyed the Dallul Mauri to some distance beyond its intersection with the arc of 100 miles' radius round Sokoto, and had put beyond question where and what the Dallul Mauri was. Captain Merrick, of the Royal Artillery, who was in command of the Argungu column in 1902, had with his officers made useful reconnaissance sketches round the arc and beyond as far as Maradi. Captain Mundy, Assistant-Resident, had done the same for a portion of West Bornu.

A boat from Liverpool takes the traveller to the Forcados mouth of the Niger, where at Burutu a stern-wheel river-steamer is in waiting to carry him up the river. For about 100 miles the way lies through the delta, a region of swamps, creeks, and dense forests, among which, after passing through the last of the rocky barriers that separate the coast-belt from the interior, are distributed the waters of the Niger and the Benue. Near the sea the mangrove is the most striking of the creek vegetation. Farther up palms, most important of which is the one whose nuts furnish the palm oil of commerce, are more conspicuous as the land becomes firmer. Villages, whose inhabitants are expert canoeists, are passed more frequently, and occasionally a trading-station. Crocodiles are plentiful everywhere, and sometimes a herd of hippo, creatures most thoroughly in keeping with their surroundings, is seen, their heads appearing and disappearing at intervals. Just before the ascending steamer enters the channel of the Niger, which discharges itself near Akassa, the Forcados river narrows considerably, and this main channel is gained by a sharp right-angle turn. All up the river the forest grows right up to the edge of the banks, and as these are continually being cut away, the trees on them fall into the water, and are carried down till they take the ground in some shallow spot and alter the set of the current, causing silt in one place and scour in another, thus adding to the difficulties of navigation. Lokoja, opposite the confluence of the Niger and Benue, may be considered the port of entry of Northern Nigeria. It was here we enjoyed the hospitality of the 2nd Northern Nigeria Regiment, and made the acquaintance of some of the troops who were destined to take part in the Kano-Sokoto campaign.

For most months in the year steamers can go between Lokoja and Jebba, the former headquarters of Northern Nigeria, another 200 miles up the river. At Jebba one must take to the native canoes. These are hollowed-out logs, propelled by poles made out of the central stems of palm leaves, which are called "bamboos" in Northern Nigeria. In places where the current runs swift and deep under a woody bank, the

canoemen have to resort to the tedious process of forcing their craft up-stream by catching and hauling on the overhanging branches. At others, and more particularly above Bussa, where large beds of reeds border the channel, and the water is too deep for poling, cross-pieces of stick about a foot long are lashed to the end of the bamboos, and thus a

FOREST SCENERY, LOWER NIGER.

purchase is obtained on the reeds. This operation disturbs countless mosquitoes, who are not slow in giving expression to their resentment. Paddles are used in the deeper part of the river, particularly when, as is often the case, it is desirable to cross to get into a favourable stretch for poling.

All the river-side people, and particularly the Nupes, are expert canoemen. They commence poling at a very early age. Their skill is most conspicuous where the stream runs wildly amongst boulders or over sunken snags. Only one of the Boundary Commission canoes was upset, and this was in some rapids above Bajibo. All the contents were successfully fished out of the river, with the exception of one bale of cloth. A long canoe journey up-stream is to be avoided if possible. Sitting all day under a mat shelter in a narrow dug-out gets wearisome long before the three weeks' journey from Jebba to the frontier is accomplished. If steel canoes, such as the French use in their journeys with the Niger flotilla, are forthcoming, the discomforts are considerably lessened, the more so as it is possible to sleep on board and avoid camping, often on swamps alive with mosquitoes. The dug-outs, too, are more or less leaky, and some care has to be exercised to prevent the loads

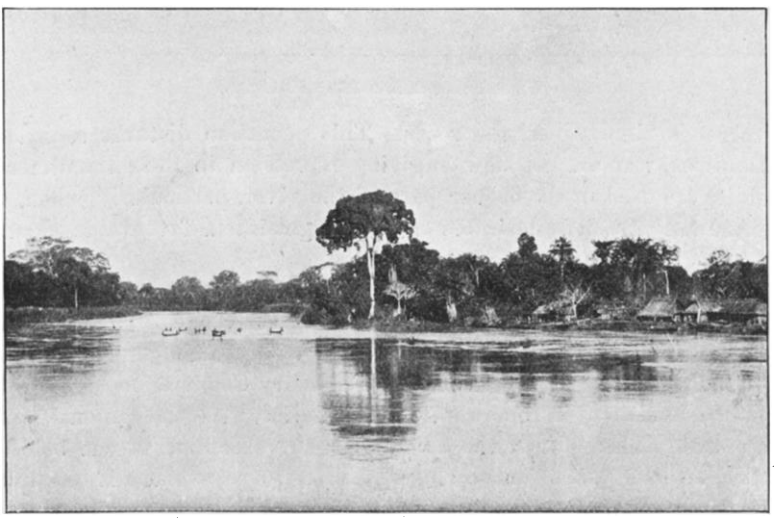
placed in them being damaged. Above Jebba rapids are frequent, but they are negotiable by the skilled Nupe canoemen, till the Wurroo rapids are reached. Between this spot and Bussa there are a series of rapids, of which three are formidable. It is advisable, in fact necessary, to unload the canoes and send the loads round by land, whilst the canoes are hauled up empty.

It was in one of these rapids that the dauntless Mungo Park met his death, when he appeared to be, after braving countless difficulties and dangers, on the point of solving the mystery of the Niger's course.

After surmounting the big rapids near Bussa, the river was still full of smaller ones that gave more or less trouble till, a few miles above Yelwa, a quieter section of the river was entered, and the journey to the frontier was accomplished without further difficulty.

Dole, near which village is the westernmost end of the boundary, lies a little way back from the Niger, on its left or eastern bank up a marsh-fringed creek. Marshes border the river for a mile or so in depth, and clumps of fan palms indicate spots where the ground is more solid. These trees are plentiful on the land side of the marshes and for some way up the Dallul Mauri.

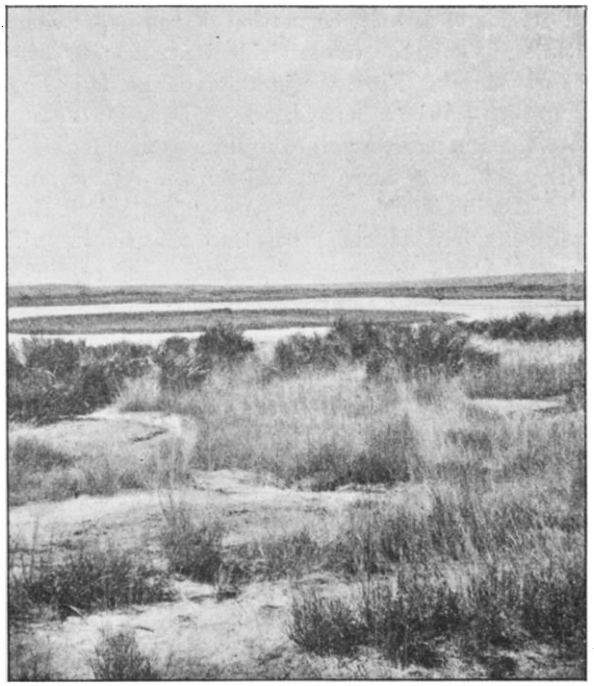
Dallul Mauri, or the valley of the Mauris, the people of Arewa, is the name applied in the Convention to a depression that can be traced with more or less distinctness from near Matankari down to its junction with



JUNCTION OF RIVER NIGER WITH DELTA.

the Niger, the Dole creek being its mouth. It was once, I consider, a river valley, but no river or stream now flows along it, except perhaps during the rains there may be a current from marsh to marsh in the lower part of its course.

The term "Dallul Mauri" is only correct for the portion of the depression that lies in the Mauri country, from near Nasserawa on the north



LAKE CHAD.

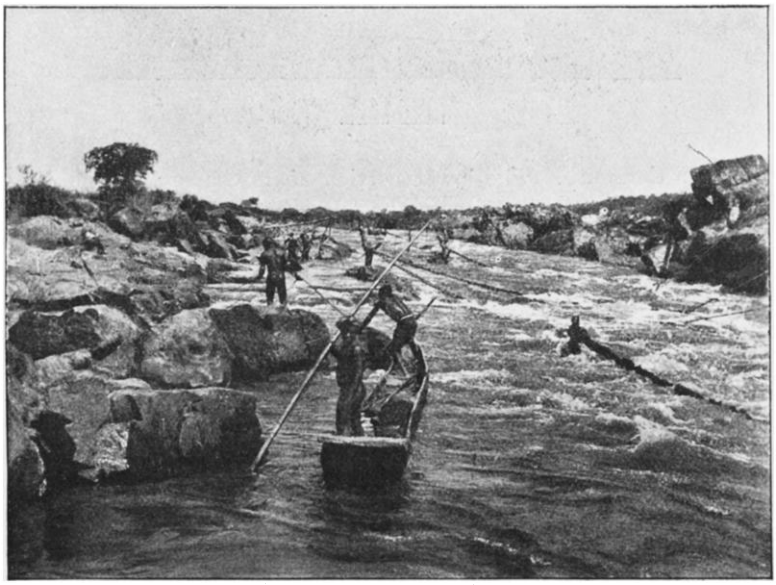
to Goru on the south. The lower portion of its course from the Niger up to its bifurcation opposite to the village of Banna is called Rafin Foga, or the Valley of Salt. This name of Rafin Foga is retained, and properly so, by the more western branch that lies in French territory, for the salt marshes to which it is due do not extend up the so-called Dallul Mauri beyond this junction point.

Leaving the Dole creek and following the valley, which must henceforward for its whole length bear the name of Dallul Mauri, we come on a grassy valley with fan palms in abundance, at first several miles in width, but gradually narrowing as we ascend. A series of depressions — the beds of marshes, dry at the time of our visits in December and January, but along which in the rains a stream doubtless flows—mark what appeared to be "the median line." On either hand bush-covered laterite scarps, more or less interrupted by side valleys, define the borders. Farther up, above the junction with the Rafin Foga, these scarps disappear on the left or west side; gently rising rolling ground, which recedes considerably as the valley widens again above Yelu, takes their place, whilst on the right, though in places hard to trace owing to

bush-covered under features, they are fairly continuous up to Nasserawa. Here there is a break of some 25 miles, after which they reappear at Budu, and, passing Matankari, trend away eastward and disappear.

The cross-section of the upper portion of the depression appears to be that of a line of fault, the eastern side being the upthrow, and the western the downthrow. From the junction of the Rafin Foga down to the Niger, the valley may have been formed by the action of water, possibly that of the Rafin Foga, but more probably there was a double fault, forming a rift-valley similar to those in East Africa. At the junction of the Rafin Foga and Dallul Mauri, and for some miles below, the water had not dried out of the marshes, and it was there that the salt villages were most numerous. Above the junction-point the bed of the valley was dry in December, the long grass and reeds are scarcer and the bush is thicker. Fan and borassus palms and large forest trees still abound, as well as evidences of the visits of elephants, giraffes, and other game during the rains. Gradually the larger trees give place to smaller varieties and thorn bushes. The shea butter tree becomes scarce after passing Yelu, the palms between Yelu and Junju and the baobab disappear almost entirely before reaching Matankari.

Dry beds of marshes, often long enough to suggest that they form a continuous channel, but really disconnected, are found right up to the



BUSSA RAPIDS.

arc. The point arose whether the median line of the Dallul Mauri was to be considered to lie along the middle of these marshes or midway

between the crests of the high ground on each side of the valley—by no means the same thing. Both views presented difficulties, but the

WOMEN TILLING FIELDS.

natives considered the Dallul to be that part of the depression where the fan palms grew, and these were only to be found where their roots could get moisture, and consequently close to the marshes. The middle line of these was therefore, with a certain amount of give and take, adopted as the median line of the Dallul Mauri.

Round the arc as far as Illela the country consists of gentle undulations of sand covered with thorny bush. In places scarps rising abruptly mark the edge of laterite plateaux that fall gently away till they blend with the general level of the ground. Occasionally a few outliers from these cliffs form prominent features.

Near Illela are groups of hills of dark, coarsely crystalline rock, I think of volcanic origin, possibly of later date than the laterite and intrusive. Some of these rise to a greater height—about 400 feet above the general level of the country—than any hitherto encountered.

After passing Illela, the arc crosses a series of valleys or rifts in the laterite sheet, which is here much more generally in evidence. These valleys have their origin outside the arc, most of them apparently to the north-east of Tawa, and were doubtless once drained by streams that were affluents of the Sokoto Gulbi, through which their waters reached the Niger.

They are much more pronounced than the Dallul Mauri or any of

the depressions met with previously, being usually about one mile wide and 200 feet (or more) deep, and, though possibly in places originating along cracks in the lava-sheet that at one time overspread the country, were, as their cross-section shows, cut down to their present depth by the action of water. Water is often found in them at a little depth below the surface, and the soil is more fertile and vegetation larger and more plentiful than on the laterite crust of the plateau. Like the Dallul Mauri, they do not now appear to be drained continuously throughout their length, for the portion of the rainfall that does not soak into the soil at once, forms pools along their courses.

I noticed the following geological section in one of them between Tawal and Bussa. First, the laterite; second, shale, laminated like pressed tobacco-leaves; third, chalk and clay mixed; fourth, chalk; fifth, shales. The strata were horizontal. In places, doubtless owing to denudation, the upper shales had been removed, and the laterite lay on the chalk, which was more or less baked and hardened in consequence. The chalk was full of echinoids and other fossils. Wherever, in this neighbourhood, I saw strata exposed, this section seemed to prevail. Probably it goes as far south as Sokoto or further, for the resident there, Major Burdon, showed me a piece of indurated chalk which he had found in a watercourse to the east of the city.

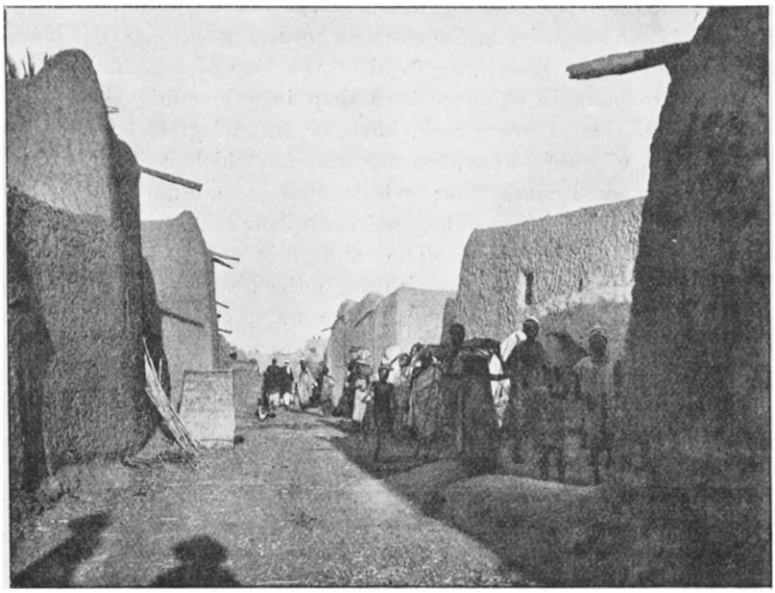
CARRIERS DRINKING AT RAIN-WATER PUDDLE.

The laterite plateau terminated near Chara and Bussa in scarps the highest encountered on the border, which trended away eastward and

northward into the desert. The Duchin Zana, a large hill which lies a little to the north of the intersection of the arc with the parallel of 14° N. lat., is probably an outlier from the plateau.

It is with considerable diffidence that I put forward any geological theory; in fact, it is only in the hopes of provoking discussion on the subject, and because it enables me to give more clearly the impression produced by what I observed, that I venture to do so.

It appeared to me that the whole region lying along the frontier from the Niger to the bluffs near Bussa and the Duchin Zana, extending to the north as far as Tawa, or even further, and possibly to the south



A STREET IN KANO.

as far as Sokoto, had, some time after the deposition of the shale above the chalk, been covered with a sheet of lava, of which the laterite is now the remains. The portion of this sheet lying east of the line Illela-Tawa must have become subject to subaërial denudation for some long period before the westerly portion, to account for the very much greater depth of the valleys. Probably, therefore, when the lava flowed over the bottom of the shallow waters in which the shales were being deposited, the earth-crust in this region was undergoing a gradual upheaval, the eastern portion rising before and higher than the western. Possibly the mud flats which are now the shales were above water at this time; certainly parts of them were, as is testified by the laterite resting in places on the chalk.

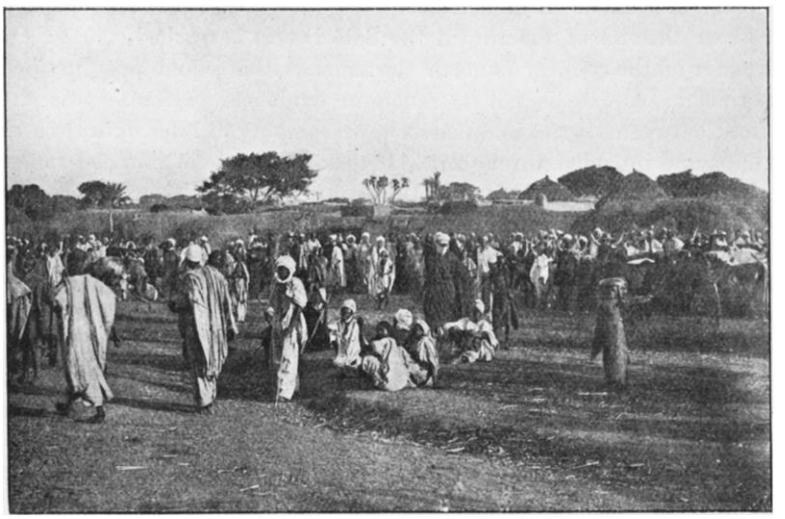
Whatever was the case, the climate of that part of Africa must have been very different from what it is now. These deep valleys must, I think, have been hollowed out by the action of water at a time when large lakes and inland seas occupied regions that are now desert. Since these disappeared, the prevailing winds have been spreading the sand that lay in their beds over what was once probably a well-wooded and pleasant land. Thus to-day we see work done in ages long past by water in carving out hills and valleys being undone by wind, which is blocking the valleys and building hills of its own, whilst it removes for the purpose all the loose soil it can gather and bears it steadily south-westward.

The drainage of the country must be chiefly subterranean. Possibly much of it finds its outlet in the marshes bordering the Niger. Though water is still doing something to alter the face of the land, Æolian influences are more in evidence here than in any country I have yet seen. The lee side of every rock, bush, or tuft of grass becomes the starting-point of a sand-dune, the material for which is being carried from more exposed situations; whilst these sand-dunes themselves gradually work down-wind unless and until their surface is consolidated and protected by vegetation. The rainfall is not sufficient to form currents strong enough to break through the obstacles thus piled up across the old lines of drainage, and the water collects in pools and hollows, from which it soon disappears by evaporation and infiltration. The old features shaped by the action of water are thus being obliterated and the country is, in consequence, most difficult to survey rapidly and satisfactorily, for it possesses few striking features, and no general system of surface drainage that may readily be seized on.

The rains commence in June and last till the end of September. Except in August, however, such a thing as a really wet day is rare. Captain Moll, the French Commissioner, told me that in his experience the week in that month in which the moon was full was the rainiest of the year, and it certainly was the case in 1903. Three or four storms a week is about the usual average for the rainy season. About two months after the rains have ceased, *i.e.* the end of November, the Harmattan sets in, and blows steadily from the north-east till April. During this time the air is misty with suspended dust; sometimes, so thick is the haze, the largest objects are invisible at half a mile. Vegetation dries up, and everything gets covered with the finest powder. The temperatures in December and January are from 100° Fahr. by day to 60° Fahr. by night. April is the hottest month; the day temperature reached 114° Fahr. in the shade, and the lowest it fell to at night was 78° Fahr.

During April and May the wind at times blows from other quarters, the air gets clearer, clouds gather, sandstorms get more frequent, till they become a daily institution, and a few drops of rain occasionally

raise hopes that are usually disappointed till June is near, and the first real shower is hailed with cries of delight from the people, who are now assured that the seed they have sown will not perish in the ground.



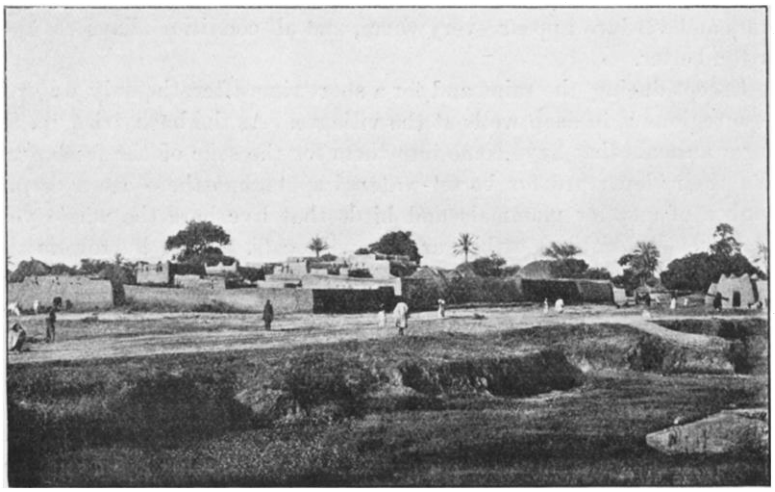
MARKET-PLACE, KANO.

The temperature ranges from 113° Fahr. by day to 76° Fahr. by night. Grass and verdure appear everywhere, and all conditions have changed for the better.

Except during the rains and for a short time after, the only water in these regions is in deep wells at the villages. As the bush dries up, the larger animals that have come into them for the sake of the fresh grass take their departure for better-watered spots, but there are a certain number of smaller mammals and birds that live here the whole year through. We noticed oribi, gazelles, wild cats, certain burrowers and rodents, guinea-fowl, francolin, hornbills, bustard, various birds of prey, and many small birds. The problem of how they managed to exist without water appeared a puzzling one. I mentioned this difficulty to some French officers, whom I have always found to be very well informed and careful observers. They drew my attention to the fact that there was, even at the end of the dry season, moisture in the leaves and twigs of certain plants, and, further, that it was probable that the bodies of white ants supplied birds with all the liquid they required. These little creatures cover everything they are going to attack with galleries made out of clay. To moisten this clay they must have water, which they bring from considerable depths. The officer in charge of the well-sinking along the road from Filingi to Tawa told me that white ants had been found 50 metres below the surface in some of the

wells. That these small insects should be capable of bringing up all the water they require for their work from depths like this appears marvellous; but no less so is the existence of the larger animals in a district where for half the year the air is hot and dust-laden, and not a drop of water exists on the surface.

From the end of the arc till the Salt Desert is reached, the general character of the country is much the same as that which has just been described. Laterite is not so much in evidence. Granite was first noticed between Maradi and Katsena, presumably of later date than the laterite, and intruded through it. It took the shape of rounded masses or heaps of boulders, which at times formed conspicuous landmarks. Nowhere did I again see any trace of aqueous rocks. There were the same undulating sandy downs, with no great elevations or depressions; but villages and cultivation were more frequent. Near Maradi we crossed several times the first river we had encountered since leaving the Niger, and this only has water for a few months in the year. It was a very respectable stream in September, and we were glad when our loads were safely over. As one approached Machena, the country got more open, and though the prospect, limited as it was by the Harmattan haze, was not very inviting, it was, nevertheless, a relief to the eye after the monotonous and uninteresting bush through which we had been travelling for nearly a year. Before getting as far as this the Niger basin has been left, but between it and that of Chad there appears to be

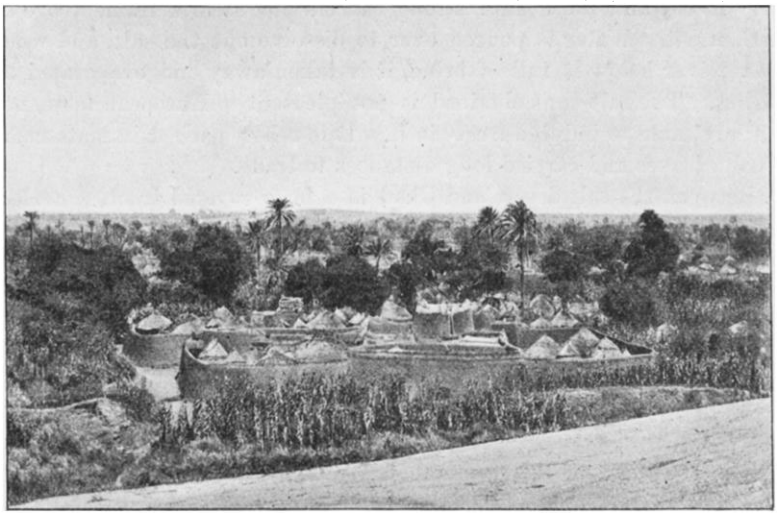


KANO.

no well-defined or recognizable watershed, for the surface drainage of the country is into pools and hollows.

Continuing eastward, the Salt Desert is entered. The meridian

that ascends northward from the parallel of 13° 20′ N. to 14° N. passes roughly through the middle of it. Contrary to expectation, this is not a dreary waste of salt-encrusted desert sand, but open plains, sandy certainly, but covered with waving grass about 4 feet high, diversified here and there by lines of borassus palms which mark the course of depressions, where water is usually to be found at a small depth below the surface even if they do not contain pools. When we passed through in November, the grass was all dried up, and the horrible burr called the kram-kram was here, as everywhere we went, plentiful. When green in the rainy season, the



VIEW OF BEBEJI, SOUTH OF KANO.

Salt Desert must, comparatively speaking, be a pleasant spot. As one gets further into it the lines of borassus palms are scarcer, and the country appears to be an unbroken rolling prairie, till every now and then a deep hollow, invisible till the edge is reached, is suddenly come upon. Some of these hollows were dry or drying, whilst others contained water deep enough for hippopotami. Round the edge of the water is usually a dense fringe of handsome feathery reeds, infested by large and fierce mosquitoes, and on the firm ground round the reeds again a thick belt of borassus palms. The hollows were of varying sizes and shapes, sometimes roughly circular and about half a mile to a mile across, and about 100 feet or more in depth. Others were long and irregular in outline. They always formed, when there was water in them, a pleasing and welcome picture. I could find no way of accounting for their origin except on the supposition that they are craters or crevices in the lava-sheets that probably underlie the sand,

and that most of the water in them is from a subterranean drainage system.

Wherever water dried in the salt desert it left a deposit behind it, sometimes of potash, and sometimes of what the African is pleased to consider table salt. Two pans close together would, curiously enough, contain deposits one of potash and one of salt. The salt deposits were worked in the same way as in the Dallul Mauri and Rafin Foga. As the water dries off the marshes or pans after the rains, the salt workers, who often hail from far, come and establish themselves at the workings in temporary shelters made of palm leaves or grass. They scrape up the soil newly impregnated by the evaporated and infiltrated water, carry it off, and fill it into strong baskets placed in a frame above an earthen pot. Water is poured over to dissolve out the salt, and when the receiver below is full of brine, it is taken away and evaporated by boiling. The salt thus obtained is not pleasant to European taste, nor is it advisable to indulge freely in it. It is neatly packed in mats made of palm leaves and carried long distances to trade.

Between the salt desert and Chad is a bush-covered tract, waterless in the dry season, except for a few wells known to nomads and hunters. From Zinder a route traverses this, keeping a little north of the 14th parallel of north latitude. After passing a group of villages near where the frontier regains this parallel, some 40 odd miles without water have to be traversed before the Mir oasis is reached. From this there is another waterless stretch of 70 miles to the shores of Lake Chad at Wudi.

South of the desert runs the river that flows past Yo into Lake Chad, near the town of Bosso. It is called Komadugu Waubé; Komadugu meaning "water" or "river." We struck it about 6 miles from Kabi, and entered on a region of trees and cultivation such as we had not seen since we left the Niger. It is about 50 yards wide, and flows in a winding channel between grassy banks about 6 to 10 feet deep. It was only fordable in places, but at the end of December the water was falling rapidly. It is bordered by large marshes, which render it impossible to follow the banks for any distance.

A few miles to the north of the mouth of this river the first view of Chad was obtained. We emerged from low forest on to a plain covered with longish withered grass that towards the horizon was green, and seemed to rise here and there in hummocky undulations. As we pressed forward, eager to see the great lake, we found that by the time the green grass was reached we were in water, and that the hummocks were reed patches which continued to extend to the horizon. The water gradually deepened as we went on, and clouds of mosquitoes, stirred up by our horses' feet, assailed us viciously.

We had reached the Chad.

The western shores of the lake are very flat. Some miles back from the water's edge is a line of sand-dunes, covered with low

thick forest. This is fringed with a belt of euphorbia, of varying depth, and then the open grassy plain falls very gently to the marshes. These, with patches of open water, appear to extend right across the lake in its southern portion, whilst the northern is much freer. Owing to the absence of any sufficiently high ground near the shore, and to the Harmattan haze, it was impossible to get any very extended view. From the sand-dunes near Barrua large stretches of open water were visible, and again, near the mouth of the Yo river, the lake appeared to be free from reeds up to the eastern horizon. Below this, on the shore opposite Aregi, where we camped on New Year's Day, and for some 15 miles southward, a line of breakers could be seen and heard along the outer fringe of the marshes, but after wading out to this, the tops of grass and reeds were visible here and there above the water as far as the eye could reach. The strong Harmattan wind was blowing steadily throughout the day, and piling the waters on the western shore. About sunset it died away, and the lake receded some hundreds of yards before morning. The grassy plain lying between the forest and the marshes varies in width from 1 or 2 miles to 10 or more. Abundance of fish-bones and hippo skulls scattered over it showed that it must at times be under water. I do not, however, believe that the rainfall in the Chad basin can ever raise the level of the lake considerably. It seems like other great lakes, notably Lake Van in eastern Turkey in Asia, to have periods of high lake at a certain regular interval of years. Between these the lake gradually falls and then rises again. This was brought to my notice by Colonel Jackson, of the Anglo-German Boundary Commission, who, no doubt, will be able to throw a good deal more light on the subject. The high and low water level, then, cannot depend directly on the annual rainfall, but is possibly due to some large underground syphon or system of syphons, which take a certain number of years to fill and empty. Curiously enough, if I remember rightly, the period given me by Colonel Jackson for Lake Chad, eleven years, is the same as that for Lake Van. It would be interesting to get reliable statistics on the periods of high and low water of the various lakes subject to this phenomenon.

In the waterless districts we had passed through from the Niger game was scarce and wild. Now, as we rode along the shores of the lake, we had animals of some sort ever in sight. Herds of korrigon, a species of hartebeeste first found on Lake Chad by Denham, gazelles of several species, notably a very handsome red and white one that may prove to be a new sub-species of the *Gazella Dama*, galloped away from us all over the grassy plain. The marshes were full of wildfowl, and close to or in them, that handsome little antelope, the cob, stood up to gaze at the passing caravan. A few ostriches were seen, and one was found sitting on its nest, a hollow in the sand containing 21 eggs. Hippo tracks were plentiful, and occasionally a herd of elephants, noblest

and strangest sight of all to unaccustomed eyes, would emerge from the forest and make their way with grave deliberation to the water's edge.

Before the reading of the paper, the PRESIDENT said: We have the pleasure this evening of having with us Colonel Elliot, Commissioner for the Franco-British Boundary Commission between the Niger and Lake Chad. He will give us an interesting account of that region, which has scarcely ever before been visited by a European, I believe. I will now ask Colonel Elliot to address you.

After the reading of the paper, the following discussion took place:—

Major BURDON: A great portion of this region that Colonel Elliot has described to-night has just been given away to France. His journey, therefore, and description are deeply interesting, because in the future it is very improbable that any British officer will be allowed to go into that country, except possibly for scientific purposes, and that not at present. I have a personal feeling of gratitude to Colonel Elliot for his description, for the information he has given me, and the maps he has given me, for that 100-mile arc round Sokoto was in my district. Now, possibly, I shall never have a chance of visiting it again. Colonel Elliot has gone into the geology of that part of the country. I think the most striking thing is that laterite plateau he has spoken about which reaches from Illela right down to Lokoja, a distance of about 400 miles. It seems to me to be absolutely flat, and keeps the same level above the sea throughout. The only difference is that as you get lower down south towards the sea the valleys become deeper. There is one break in it which extends to about the 11th parallel from Yelua on the Niger right across to the Kaduna river. That, I believe, is granitic, and the rock is entirely different from the laterite formation on the north and again on the south, and it is in that region that you will find the rapids Colonel Elliot showed you. Colonel Elliot touched on the alteration in the drainage of the country. You will remember that he showed a scene on the Sokoto river with his caravan crossing it waist-deep. Two months later than that photograph was taken, after the rains, when the rivers were very much fuller, I tried to get up from the south, and found there was no outlet at all. The whole of that mass of water was absolutely lost in a marsh. It never flowed into the river to which it should have been an affluent at all; it never reached the Niger. The natives said it had been growing less and less for several years past, and I think it is a very striking example of what Colonel Elliot said about the rivers being blocked up by the action of the air and the sand off the Sahara. Luckily, in this case, the British occupation has come in time, and the river has been cut so that it now flows; and during three or four months in the year there is, therefore, river communication right up to Sokoto. Colonel Monteil passed along there some twelve years ago, and accounted for the various valleys as being old arms of the Saharan sea. It seems to me it is much simpler to explain the loss of water by the theory Colonel Elliot has suggested—the simple blocking up of the rivers by the sand from the Sahara. In showing a picture of a stockaded village, Colonel Elliot described the lawlessness of the country, and spoke in the present tense. What he said was quite true at the time that he passed through the country, but that was before the British occupation, so that I hope you will regard it as an historical tale now. That lawlessness does not exist, and there is nothing more striking or encouraging in the result of British occupation than the way in which the people allow all their fortifications and walls to fall into decay at once. They say openly they no longer have any need for them.

Dr. BATHER (Assistant Keeper of Geology, British Museum): Among the

ANGLO-FRENCH BOUNDARY

from the

RIVER NIGER TO LAKE CHAD.

as defined by the Convention of Paris 1898.

From Surveys by the

BRITISH BOUNDARY COMMISSION.

Scale of Miles.

10 0 10 20 40 60 80 100

Nat. Scale 1: 3,000,000 or 47·34 miles = 1 inch.

RIVER NIGER TO LAKE CHAD.
BRITISH BOUNDARY COMMISSION.

THE GEOGRAPHICAL JOURNAL 1904.

U D A N
LAKE CHAD
NORTH BORNU
Nguigmi
Mir (Oasis)
Wudi
Gure
Likariri
Dideri
Kaniwa
Godaram
Abaram
Addia
Jonkari
Garomir
Temsu
Demogaram
Kamburi
Fayeram
Barrua
Bossa
Yo
Pawa
Arigi
Kederam
Gashagur
Kabi
Gasofa
Gurselik
Karagu
Kosolua
Calligeri
Gamdu
Zumber
Sherri
Jadkorum
Adubur
Lada
Deuchi
Bamasak
Zagari
Gumshi
Kaderi
Maini
Maragwa
Budum
Gollari
Machena
Gogaru
Guruwu
Alangilori
Kungoa
Bulmori
Fido
Guidam
Kechelari
Gillibusur
Kukawa
Kawa
Arassa
River Yo
Jawa
Amai
AGUM
FRENCH SUDAN
DAMERGU
Kanem
Lake Chad
Zinder
N. Goigmi
Dideri
Barrua
Maradi
Agi
Sokoto
Kano
Katagum
N. Bornu
S. Bornu
NORTHERN NIGERIA
Zaria
Bauchi
Yola
Borgu
Nupe
Nassarawa
Illorin
Kabba
Bassa
Muri
ADAMAWA
YORUBA
LAGOS
SOUTHERN NIGERIA
Western
Central
Cross River Div.
Eastern Div.
BIGHT OF BENIN
GULF OF GU
Lokoja
Lagos
Jebba
Bird Pk
Yola
R. Niger
R. Benue

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