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PROCEEDINGS
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AND MONTHLY RECORD OF GEOGRAPHY.

Notes of a Trip from Zanzibar to Usambara, in February and March, 1879. By KEITH JOHNSTON.

(Read at the Evening Meeting, June 23rd, 1879.)

Map, p. 616.

THE districts of Usambara which we visited in our preliminary trip have been so recently described in the 'Proceedings of the Royal Geographical Society,' by the Rev. Mr. Farler, of the Universities Mission, whose long residence at Magila has given him an intimate knowledge of its surrounding country, that there remains little or nothing that is new to add to his account. Our attention was, however, more specially directed to the geography of the route; several additional positions and heights were instrumentally determined, so that the accompanying map may prove a useful supplement to his chart. The appended notes on the geology and natural history of these districts, by Mr. Thomson, will be found to give good general ideas on these subjects.

Our native party for Usambara consisted of Chuma and nine men. For rations and payments by the way, we had a small stock of "ulayiti," or English cotton cloth, besides some pieces of broad blue "kaniki" and of red "bandera," along with a few pounds of white beads and some hoes. Four 5-lb. kegs of gunpowder were also taken to give as presents. It is worth noting that the Usambara people stand almost alone now in East Africa in preferring the thin, and comparatively poor and worthless, Manchester cotton, to the strong and durable American cloth which has ousted the British manufacture in all other parts. We found that silver dollars and pice pass current in most parts of Usambara, so that one might travel with these alone; but rupees are rejected excepting on the coast, no doubt on account of their fluctuating value.

The Bay of Pangani is enclosed north and south by two converging edges of the raised terrace which skirts this part of the African coast,
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and which run inland in the direction of the river valley, the terrace having evidently been cut through at this point by the action of the stream, and then of the tide ebbing and flowing strongly out and in. The head of the bay is closed by a north and south stretch of sand running from the base of the northern cliff to the mouth of the river, immediately over which rises the southern or Mbweni bluff. Evidently in former times the river has had a branch with main outlet along the base of the northern cliff, the channel it has abandoned being plainly marked there by a depression filled with marshy pools. The low delta land, between, retreats from the sea in parallel wave-like ridges and hollows of sand, covered now with luxuriantly growing coco-nut trees, bordered by a mangrove belt along the sea face, where the tide forms a lagoon at high water.

The town of Pangani lies close to the river mouth, at the south-east corner of the old delta; about a dozen fairly good stone houses belonging to the sultan's governor, the Arabs and Hindi merchants, stand next the river; behind these the native huts are clustered, and reach back into the coco-nut groves.

Boats and outrigger canoes are constantly plying to the opposite side of the river, about 300 yards across in this part of the estuary, to where there is a narrow fringe of houses and huts along the narrow margin. Above rises the Mbweni cliff, which shows red here and there between the masses of green that cover it. The population of Pangani and its surroundings may be about 1000 in all, at a rough estimate.

We had a letter of introduction to the sultan's governor, who formally received us, and gave some information about the trade of Pangani. It is the port of all southern Usambara and of the Uzegua country in the river valley, exporting grain and tobacco, live stock (cattle and goats), and ghee butter, the two latter chiefly from the Rufu Valley. It used to have a large caravan traffic with the Masai country and Kamalondo, on the coast of the Victoria Nyanza, but this has declined very greatly; for the last caravan from Pangani left it a year ago, and has not been heard of since that time.

From Pangani, which we left on the afternoon of Thursday the 27th, our route lay northward, first along the level sands of the head of the bay, then up the steep cliff edge, 50 or 60 feet high on the northern side of the delta. Ascending this, we found ourselves on a level terrace, partly wooded, partly covered with coarse grass, and partly cleared to form rice fields and banana plantations. Before reaching the district of Madanga, two hours from Pangani, we had ascended to a second less definitely marked terrace. The night was passed in the village of Mlulu or Mruru, which is formed within a clearing of a denser part of the woods and jungle which close it in on every side, the only entrance being a narrow gateway between rows of upright posts driven into the ground and overgrown by vegetation so as to be almost concealed. The

huts, about twenty in number, are of irregular oblong form, with rounded ends, and thatched with shaggy straw that hangs down close to the ground, the entrance being so low that one has almost to crawl indoors.

On the 28th we left Mruru at daybreak, and turned north-westward towards the mountains behind Magila, some of whose peaks began to be visible at intervals. For a few miles our way was still in partially cultivated country, but in less than an hour we emerged on the broad uninhabited wilderness called Nyika, which lies between the coast belt and the base of the inland hills. As far as a chain of pools called Kakindu, about half-way across, the Nyika presents a nearly uniform aspect of gently undulating park-like land, dotted over with small trees, among which the branching mlala, the Hyphæne palm, is by far the most frequent and characteristic. Here and there, and especially at the point marked on the map, we came upon little groups of tall *Borassus* palms, with smooth stems contracting, at a height of 50 or 60 feet above ground, like a bottle neck, to throw up a slender pillar carrying the fan leaves of the crest.

The Kakindu pools afford the only potable water on this route across the desert at this season, and we found the supply excellent, though an uninviting green scum covers them. Beyond these the country becomes more undulating, and the branching palms that had been characteristic before, give place to acacia thickets. One large isolated tamarind (mkwaju) beside the path marks the point of divergence of a southern path to the market of Mawia, two hours distant from Pangani.

A few miles further on, the inner border of the wilderness is reached, and we ascend the first rise of the hilly country through woods and bush. A shade tree used as a resting-place, and a fenced well beside it, are the next points reached; these mark the meeting-place of several routes, especially that from Umba in the north and from the Magila district in the north-west. We go on by the latter up hill and down dale, through woods and by cultivated clearings, obtaining occasional backward views across the desert to the blue sea, till we turn aside by a little green lane to the village called Kwa Makumba (or Makumba's residence), which was to be our halting-place. As we entered, some of the villagers were climbing about among the fronds of the coco-nut trees that surround the huts, collecting the tembo or palm wine from the cups hung to receive it. The chief and his second in command, who were evidently partial to tembo, were riding double across a log in the middle of the village, and there they sat all the afternoon and evening.

Near the entrance to Kwa Makumba there is a fine view westward over swelling hills and ridges to the blue mountains; most of the ridges are densely wooded, the white stem of the mparamusi showing out here and there in contrast to the general green.

Our way onward on the morning of the 1st of March was up and down, over these lower hills and the cultivated hollows between, over

the stream of the Mkurumusi and on to where a broad, well-kept path leads up to the mission house and church of Magila, whence there is a fine panorama of the mountains. At Magila we were most hospitably received by the Rev. Mr. Phillips and the Rev. Mr. Johnson, of the Universities Mission. The former of these gentlemen accompanied us in the afternoon up the rocky cliff north-west of Magila, which was ascended by Captain Wharton and Dr. Kirk in 1877, and which was found then to be about 1950 feet high. We reached it after a stiff climb up the wooded valley of the Mkurumuzi torrent, which tumbles down the mountain side in little cascades, passing a small village perched on the shoulder of the mountain not far from the top. The view from the summit of the crag was very fine. From north-east to south-west the horizon was closed in by the dark, forest-covered mountains behind us, reaching round from the summit called Kiturwe to the long barrier that terminates in a slope called Kiamahondo, a short distance from the Rufu. The dark peak of Tongwe stood up prominently in the undulating country southward; and nearer lay the grassy hills that our guide called Serengala. South-eastward the distant bluff of Pangani was distinctly seen, and eastward the broad inlet of Tanga; while between these the level of the Nyika wilderness was distinctly marked off from the undulating Bondei country at our feet, dotted with villages and cultivated tracts.*

This moon in the Magila district is that of the "Mvua ya mwaka," the rain of the year, which precedes the three months of the "Masika," or rainy season, that lasts till the end of May. The beginning of this moon is the great sowing time, and the rice, the most universal crop, is just showing its tender green shoots above ground. The showers which come again from the north in November are also called the "Mvua ya mwaka," and then there is a lesser planting time.

We left Magila on the morning of the 3rd, when the sun was just beginning to light up the tops of the mountains, leaving the valleys still in shade, and made our way westward to turn the southern corner of the Magila Range. Rounding this corner, we opened a fine view of the broad basin which lies between the two outer mountain ranges, and went on across it by a regular alternation of wooded ridges and cleared hollows, with plots of bananas, cassava or mhogo, or rice, in each of which a few natives were at work.

Approaching the other side of the basin, we crossed a streamlet called

* On beginning to fill the barometer which I had brought up-hill, I was much grieved to find that the tube was broken across just above the cistern. The same accident happened to a George barometer of the same pattern (the one in which the cistern is rigidly screwed to the tube) in South America. This instrument was in perfect order in Zanzibar, and was carried wrapped in bedding; yet, notwithstanding this and its triple covering of rubber, brass, and wood, the weight of the empty cistern had snapped the tube in some jar that it had received. I have always preferred the rubber stops to the rigid screw, and fortunately have a spare one of that pattern.

the Tango zani Kara, and then ascended a steep wooded hill. At the top of this we reached a circular clearing where a busy and noisy vegetable market was going on, the buyers and sellers, two or three hundred in number, being almost all women. This spot marks the boundary of the Bondei country as distinguished from Usambara proper.

From this a steep descent brings us to the clear stream of the Kihuhui, a tributary of the Zigi, and hence we obtain a fine view of the peaks of Mringa. Then follows a long climb through the forest and corresponding descent by wet, slippery wood-path to the Zigi, which was reached at eleven o'clock. The scene from this crossing of the Zigi is very fine: dark wooded mountains rise up from the valley on all sides, the stream is overhung by the richest vegetation, and bordered by ferns * along its banks, and flows now rapidly over its boulders, now quietly in deeper pools. It is crossed where an islet divides it into two branches, each of which is bridged by a great mvuli tree thrown over it. In one of the pools below the crossing, we came upon an artificial dam in which several fish-traps, of exactly the same pattern as those used in the Thames, were set. We rested on the island in the Zigi, and had a number of visitors: one old man demanded a present, as he said he was headman of all these parts; but his cravings were quite satisfied with an empty meat tin, which we left him polishing in the river. At two o'clock we left the Zigi and climbed up through the forest along the slope of the glen in which the river flows, passing several little torrents, till the village of Kodongo was reached. From this point we had a magnificent view down the glen eastward, and across the valley to the mountains of Magila: westward the forest-covered slopes that we had still to climb rose steeply above us. From Kodongo the path lay straight up the mountain side, and for an hour we were climbing wearily one above another. So steep is this ascent, that in wet weather when the soil becomes slippery the natives can neither go up nor down. At length the summit was gained, and turning north-eastward along the grassy top of the mountain, we came to the first gate of Msasa, where our guide fired off his flint gun two or three times to announce our arrival. Passing through this, and a second stockaded gateway, we found ourselves on the open summit on which the village stands. Msasa consists of about twenty circular huts with conical bee-hive roofs that reach almost to the ground, a low semicircular opening being cut opposite the doorway. The chief of this hill fort is Abdullah, an Arab, who for some reason found it best to leave Zanzibar and to seek retirement in these mountains. There he soon gained a position, for he is by far the most able man of any of the chiefs of this section of Usambara, and Kibanga of Handei is said to be almost completely under his control.

Looking west and north-west from Msasa the view extends over a

* One of these resembled a giant Scolopendrium, but had small seeds dotted over the reverse of the leaf.

wide basin, enclosing several minor ridges and valleys, to the long high range of Handei which bounds the horizon. All this area is so densely covered with dark tree-tops, that not a spot of open ground is to be seen except on the very summits of one or two of the highest of the distant hills. North-east and south-west, the prospect is closed in by mountains somewhat higher than this of Msasa, but to east and south-east it extends down the valley of the Zigi and past the mountains of Magila to the plain beyond, in the direction of Pangani. The boiling-point of two thermometers was $206\cdot9^{\circ}$, so that the elevation of Msasa is about 2900 feet above the sea. Our men complained bitterly of the cold, and kept up fires all night, though to us the night air was only refreshingly cool. Here, as at Magila, the night sky was covered with heavy clouds which rolling up from north-eastward made observation for latitude impossible.

At daybreak on the 4th the valleys beneath us were still shrouded in mist, and this had not altogether cleared off when we began the descent into the dark forest on our way to Handei an hour later. The whole of this day's march was through such dense forest that we scarcely saw the sun. The path wound through short underwood of shrubs of great variety, among the tall, straight tree trunks, across the ridges which run parallel to the main lines of the mountains. The first considerable stream we crossed was that of the Pempunga; the next the Pemkuyu, a much larger stream, and the main upper tributary of the Zigi. It is crossed where a number of large gneiss blocks have fallen across it, and from there the vista along its banks, overshadowed by tall trees hung with creepers, was very beautiful. Here by the river bank we noticed for the first time several groups of exquisite tree ferns growing to about 15 feet in height, as well as the spreading miali, or mwale palm, whose great fronds seem to grow directly from the ground. The midribs of its huge leaves are laid together to form hut doors almost universally in Usambara.

At noon the outer gate of Ngambo, the present capital of Handei, was reached, and more gun-firing gave notice of our approach. The chief Kibanga had been informed by messengers of our intended coming, and so his men were ready to salute us as we passed between the huts with a volley of musketry, but the flint guns were so crammed with powder, and were fired from the knee in such a promiscuous way, the men dancing and shouting at the same time, that we were very thankful when the noisy welcome was over.

The village of Ngambo was the most considerable we had yet seen in Usambara, consisting of about forty large circular or oval huts. A circle of these placed at the inner end of the village and shut in by a palisade forms the chief's quarters and the residences of some of his many wives. All round the village, excepting the gateways, a dense jungle, which would be most difficult to penetrate, makes an efficient fortifica-

tion, and outside this a second barrier is formed by felled trees and deep trenches. The gateways are in walls of posts driven into the ground so as to form a mass quite 6 feet thick, which reach into the jungle on each side, and each narrow gate has two doors formed of heavy single slabs of timber.

When we were settled in the hut assigned to us, Kibanga came to pay a formal visit. He is brother to the present king of Fuga, but is constantly at war with him; the story of the political troubles and divisions of Usambara since the death of the former Kimweri has been given by Bishop Steere in Sir Bartle Frere's 'Eastern Africa' (p. 35), as well as by Mr. Farler in his recent paper, so that it need not be repeated here.

Kibanga's features differ from those of any of his attendant villagers, and indeed from those of any Usambara man we had seen. His skin is of much lighter shade, and his peculiarly curved nose, deep sunk eyes, lined forehead and small ears, reminded one much of the portraits of Theodore of Abyssinia. I could not find that he had any tradition of the origin of his people, except that at first their mothers were Uzegua women.

Our conversation, carried on through Chuma, drifted quickly into the subject of the geography of the district under Kibanga's rule, which extends nominally from the Pemkuyu westward to the valley beyond the mountains of Handei, south to near the Rufu and northward two days' journey.

The interview over, Kibanga retired, and presently sent us a sheep and some fowls, providing also a quantity of rice for the men. The return present consisted of several cloths of various kinds, a keg of powder, several hoes, and a kofia and kanzu, or worked cap and long garment, with all of which he expressed himself well satisfied.

During all the evening and well into the night we were entertained by dances. These were begun by the children of the village, boys and girls forming two opposite lines, the one side repeating a monotonous chant of "Ngambo-yambo," the other replying "Oi, oi," and keeping this up throughout the dance. This was begun by one of the girls shuffling across the space between the lines, feet together, by a peculiar jerking of the body, choosing a boy partner, and shuffling back with him in a sort of waltz, in which arms were changed at each step. This was followed by a furious sort of war-dance by the young men, who ran round in a circle, shouting and clapping hands in time, two opposite in the ring darting into it at intervals, and after dodging one another about returning to the rapidly moving ring.

The night closed in dark and cloudy, so that the much desired observation for latitude seemed hopeless, but about three o'clock we were wakened simultaneously by the invasion of the hut, under the eaves of which we were sleeping, by myriads of sharp-biting ants, which covered roof and floor, and walls, and posts, and literally rained upon us. Escaping from the hut, I found that several stars were visible, and

so occupied the time during which the ants were being driven from our habitation by means of fires lit round it, in getting a latitude of Ngambo.

On the 5th, accompanied by Abdullah of Msasa, who had come over with us, I climbed the hill of Handei, the top of which is about 2 miles direct distance north-west of Ngambo. The boiling-point thermometer had shown 206.6° at the village, or an elevation of about 3100 feet. The hill was quite 900 feet higher, or about 4000 feet above the sea. Gradually, as we ascended, the clouds that were sweeping from the north-east lifted: the view from the summit was magnificent, and disclosed features of which I had no previous conception.

Immediately beneath us lay a great valley, 5 or 6 miles wide, extending from N.N.E. to S.S.W.; bordered on this side by the mountains of Handei, which fall almost precipitously down into it; on the other by the sharp-cut edge of what may be called the plateau of Fuga, over which, range upon range of mountains filled up all the western horizon. The bed of the valley seemed almost level, except where a little green hill ridge called Churui rose in the middle. On this side a river named the Muremwa meanders down to the Rufu, and at the base of the opposite mountains the larger Ruengera follows a parallel course, coming down from the western plateau through a gorge into the plain. Northward the valley was divided into two upper branches by the peak of Rutindi, on the flank of which we could see the huts of the village of Hundu, where the chief Kinyassi resides. The western branch, along which we had a distinct view, was closed at its termination by very high and apparently isolated mountains. Their names were given me by Abdullah, who knows all this country very thoroughly. The most northerly are Yamba (352° to 355° true), and Gombero, a flat-topped steep-sided mountain (351°); both of these belong to the district of a chief named Shatu. Kongoi is a very distant flat-topped mountain ($348^{\circ} 30'$), beyond which all is said to be plain country. The Bumbuli Hills in which the Ruengera rises centre about $324^{\circ} 30'$; Baga, the furthest mountains we can see over the northern part of the plateau, extend from 315° to 317° ; next the rounded dome mountain, on which Fuga stands, was distinctly seen, and appeared to be about 25 miles off in direct distance, though it is two days' march from Ngambo by path; its bearing from this is 304° true. A large swampy lake in the mouth of the western branch of the valley, between Rutindi and the gorge from which the Ruengera issues, is named Kumba; it is not connected with any river. Along the opposite slope of the mountains Abdullah pointed out in succession the village of Sembakeza (chief Mwakimungu), which lies on the track to Fuga; Tamota (chief Kihoyo), where there is another pass up from the valley; the Murungui Valley (chief Mandia), Muraro (chief Sindano), and Vugiri (chief Joho). As far as I could understand the accounts given, the most important river beyond the Ruengera is the Mkomazi,

which goes from near Masinde (Semboja's town near and beneath Fuga) to the Rufu, having for tributaries the Mwasha, the Kosoi, and the Zumui, the two latter being passed, I believe, on the way to Fuga from Handei.

The broad lowland or valley beneath us is named Sediya. It was formerly very populous, but since the wars of the succession to the throne of Fuga, its villages have been destroyed, and it is now uninhabited, no one on this side venturing towards the Fuga Hills, and no one coming thence except at risk of life. The Masai have made it an easy line of descent in their raids on the cattle of pastoral Uzegua; their bands come by the base of the Gombero Mountain, and pass along the western side of the valley to the plains of the Rufu.

South-eastward in the opening of the valley mouth appear the wide levels of Uzegua, bordered in the west by a chain of isolated conical hills, one of the nearer and more prominent of which, called Mbwego, bears 224° . Along the line of the Handei Mountains, besides the high point upon which we were standing, the most prominent points visible northward along it were the rounded domes of Pemba and Kiranga, and to southward the green grassy peak of Sangarawe rising out of the dark forest, and that of Ubiri a little more distant. Pemkuyu rises behind Pemba Hill, and Zigi in that of Sangarawe. Looking eastward, we could trace their valleys between the dark forest ridges till they unite not far from Msasa. Over the ridge on which Msasa stands (and which seemed low from this elevation), a wide stretch of the maritime plain was visible, as well as the distant bluff of Pangani.

It is remarkable that the great forest of Usambara seems to be confined to the high basin enclosed by the triangular block of mountains between Msasa and Handei. Though the Magila Range and the country all down to the verge of the wilderness is well wooded, the trees are comparatively small; the Sediya Valley, on the other side, has patches of wood only, the rest being open grass-land; and the mountains of what I have called the Fuga plateau, seem to be almost bare, though Captain Speke mentions "prodigious wooding" on the hills south-west of Fuga.

In returning from Handei, we chose the path by the district of Bulwa (I could not find that there had ever been any town of this name), which crosses the range on which Msasa stands, but at a more northerly and much higher point. Abdullah was again our guide, this time an unwilling one, as he had hoped we would return by his own village. The path led back into the great forest; first down into the valley of the Pemkuyu, which was crossed by a picturesque but difficult bridge of a single tree thrown across its rocky bed at a considerable height; and thence over another forest-covered ridge to the channel of its tributary, the Vungue, which is the boundary stream between the districts of Handei and Bulwa. From the Vungue we began

the steep ascent of the range across which Bulwa extends, and after an exceedingly steep climb for an hour up through the forest, reached an overhanging rock called Mavumi, which is used as a resting-place.

Some of the great trees we had passed in the ascent were giants of 8 to 10 feet in diameter above the converging point of the broad, flat, perpendicular buttresses which support their base; they rise often 60 to 70 feet clear without a branch, and their whole height is not less than 150 to 200 feet. The underwood is generally short, the ground often clear and strewn with a matting of dead leaves; the branches above interlace so closely as to exclude the sunlight, and produce a dim, subdued light between the great pillar-like stems.

Another steep climb of half an hour up a rough torrent-bed brought us to the forest-covered summit, which is probably about 4500 feet above sea-level.

In descending the opposite slope, so steep in some parts that one had to hold on by the hanging lianas to prevent sliding down headlong, we had momentary glimpses through the trees of the sharp rock-peaks of Mringa, at the northern end of the Magila Range, and of the fine valley of the Zigi between. After an hour of steep and rapid descent, we came to the first hill village of the Bulwa district on this side; and at noon, after another hour steadily down-hill, passing several more hamlets, we reached the village of Zimbiri in the valley, a place of about sixteen huts, more ragged and unequal in appearance than those of Handei. The prospect from this point was very fine; east were the sharp points of Mringa rising above the wooded slopes; westward the dark mountain, down which we had come, seemed to overhang the valley; while northward the view opened out across a wider valley to the grand range of mountains in which Rukindo, Sengoma, and Mtae are the most conspicuous points.

At three o'clock we left Zimbiri, bidding good-bye to Abdullah of Msasa, who was rendered happy by the present of a keg of powder, and descending eastward reached the Zigi again. Here it had grown into a fine river; where we crossed, it forms four branches, each of them large streams with islands between. Above, where we turned to follow up its right bank for some distance, it was one united river, almost as broad and deep as the Thames at Oxford in its normal condition. Beyond the Zigi the old chief of Zimbiri, who had offered himself as our guide, became confused as to the paths, so we turned back to the village of Rufinga, the gate of which we had passed shortly before, and there found quarters for the night. On entering the narrow gateway, and passing up the narrow path beyond, we found this a very clean, well-built village of about twenty huts, surrounded on all sides by jungle, above which we could see the steep sides of Mringa. Though the moon rose clear over the hills, the night clouded over, and all attempts to obtain a latitude were vain. Sleeping outside, our rest was interrupted first by

the wailing of one of the village dogs, as it was carried off into the jungle, no doubt by a leopard, and afterwards by heavy rain.

On the morning of the 7th we started early, with a fresh guide, in the direction of the path to Magila; and after skirting the hills on the eastern side of the valley, passing the base of the fine projecting cliff of Rugamba, and winding southward over wooded ridges and by cultivated plots for two hours, reached the path we had formerly traversed on our way from Magila to Msasa. Following the old path, Magila was reached again at ten o'clock.

During our halts at Magila, the incessant drumming at one or other of the surrounding villages made one curious to see this monotonous instrument. It consists of a hollow cylinder of wood about two feet long, narrower at one end than the other, ornamented by flat panels, the ends (the larger about one foot in diameter) being closed by skin tightly pegged over them.

It is beaten to one monotonous measure for the dance; to announce war from village to village the beat increases from slow to very fast, and is accompanied by the cry of "Kondo" (war); and a third measure is used in driving out a "pepo" or devil that is supposed to have taken possession of some unfortunate. The drum is then beat close beside the invalid; the idea being that the spirit is so fond of music, that he will come out of the possessed one to hear the drum better; when this is supposed to have taken place, the drum is passed on to a second performer, and then to a third, and so on, till the poor devil gets lost, forgets where he came from, and so the patient is freed.

A small clarionet called the "zomali" about 18 inches long and with a reed mouth-piece is also a favourite instrument; it gives out sounds much resembling those of the Welsh bagpipe without the drone, and accords well with the highland landscape. A third is a double-stringed lute, called the "pangu" or "zeze," in which half a calabash serves as sounding board. The "kwacha" is a shield-like board, about 2 feet long and 8 inches wide, rounded at the ends, into which two round notched sticks of hard wood are inserted so as to form a curve over it; these notched sticks are then rubbed up and down with small sticks, so as to produce a rasping and most unmusical sound. A more capable instrument is the "viringa," a large, rude, piano-like contrivance formed of two thick banana stems laid parallel, and of pieces of hard wood fastened crosswise between these, made so that those giving the highest notes are in the middle, the lower to each side. It is played upon by striking the notes with two sticks.

Besides the marriage custom related by Mr. Farler, a few others that were gathered at Magila may be noted. After birth a child is kept indoors strictly for five days; girls never touch fowl till after marriage, when the husband cooks a chicken and shares it with his wife. Circumcision is generally performed at the age of three or four. Tribal marking

feasts take place at irregular intervals, and there is no special age at which this ceremony is performed. It is accomplished in some tribes by lancing a certain number of marks on the upper arm, when the operation is called the "ndege," because the subject being blindfolded is supposed to be lanced by the beak of a bird or "ndege" which comes to him; the real operator being the village medicine man. In others, as at Handei, the marks are burned into the skin so as to leave a certain number of rounded lumps, four to eighteen marks perhaps being used by the different tribes. These marking days are concluded by a dance, in which kilts of mbuyu, or baobab-bark fibre, are worn, the face and body being sprinkled with white ashes, and a zebra's tail stuck into the belt of the kilt behind, and waved about by a peculiar movement of the body.

When anyone is about to die the drums are brought to the bedside by the men, and women gather into the hut to be ready to weep at the proper time. After death the body is washed and covered with a cloth, and then at a signal given on a drum, a general wailing and drumming begins. The grave is dug about 4 feet deep, and after that a lateral hollow of sufficient size is scooped out, and the body being placed in this is shut into this side cave by a board and the grave is then filled in. Indian corn is then spread on the grave, a custom which may have arisen from the notion that on a man's death the corn he has planted and grown belongs to no one. On the death of a Mohammedan an animal is sacrificed, and prayers are addressed first to God asking him to receive back his creature, and then to the defunct adjuring him not to come back to fight with anyone in a dream.

From Magila we made our way on the morning of the 10th eastward to Umba, where the Universities Mission has another station. We were preceded by the Rev. Mr. Yorke, who had been staying at Magila for a few days, and who, assisted at present by Mr. Woodward, is in charge of the station. Our way led across the hilly and undulating Bondei country, across the Mkurumuzi, past a number of villages, the chief of which were Maveta and Mlembule, and by many large cultivated clearings, to the winding, half-dry bed of the Ukumbine, and from that to the large village of Umba enclosed in the woods which border the wilderness.

The Ukumbine comes from near the Kilima Kiguruni, which we had passed on our way to Magila; it had dried up at the time of our visit to a chain of saline pools rendered so no doubt from the passage of the water over some beds of deposited salts; yet from these the only water supply of the town of Umba and of the surrounding district is obtained.

The town is a strong place entered by two approaches, each guarded by triple gates made from the wood of a species of acacia called m'kongolo, black within and white without, which is so hard as to almost withstand the attacks of the white ants; on other sides it is

protected by a dense jungle. It has not yet been attacked by the plundering Wadigo, whose bands are the scourge of the settled people on the borders of the Nyika, but several villages in its close vicinity, among them the large one of Vumba, have been abandoned within recent months on account of the attacks of these raiders.

The mission station, on entering which we had a most enthusiastic reception by Mr. Yorke's boys, lies in a little clearing of the jungle behind the town, shut off from it by a gateway, and consists of one or two huts only, the church being placed in the middle of the town itself.

From a height outside the gate of Umba I was glad to obtain a number of cross bearings, which enabled me to fix the position of several points of the Magila Range, of the Rukindo Heights, of Bamba Hill, where plumbago is abundant, and of the now distant peak of Rutindi, which we had seen from the hill of Handei, &c.; and an observation for latitude was obtained in the evening.

As we were about to turn in for the night in one of the mission houses a loud roar was heard outside in the jungle, and on going out it was heard again several times more distinctly; Mr. Yorke and some of the natives recognising the sound as the growl of a lion. This was the only wild animal we had heard on the journey; indeed, the scarcity of game in all this district struck us as remarkable.

In returning from Umba our way led south-westward over the undulations and cultivated hollows of the Bondei country, to where we rejoined our old track at the fenced well and tree which had served as our former resting-place. The meeting-point of the paths was crowded to-day with men and women bearing burdens of fresh and dried bananas, rice, cassava, tobacco, &c., on their way to market at Mawia, near Pangani. The men were all armed in some way, either with spears or, most frequently, with bow and short poisoned arrows, tipped either with iron, in various shapes, or with hard wood, and feathered. All the way across the desert to where the track to Mawia branches off from that we followed, our party was mixed up in a long procession of these Bondei and hill people.

A few notes on some of the chief cultivated and wild vegetable products of this part of Usambara may be useful. The most populous and the only extensively cultivated districts through which we passed were those of the Bondei or valley country, between the inner edge of the wilderness and the base of the forest-covered mountains, including in this the broad valley of the Zigi between Bulwa and Magila. Almost every part of this belt is dotted with villages and patched over with plots of cultivated ground, which lie chiefly in the hollows between the wooded ridges. The common products are rice, mhogo or cassava, maize, and sugarcane; tobacco is cultivated here also to some extent, but seems to be the special product of the Handei district, whence considerable quantities of the sun-dried leaf, beaten into little round flat cakes about

2 inches in diameter, are sent down to Pangani for export. The tobacco is coarse and strong, but of fairly good flavour.

Native cotton is used for thread-making to a small extent, but the staple is short and the quality inferior. The "mbungu" (*Candolphia*) vine is known from Pangani inland all the way to Handei, and at Magila I obtained from Mr. Phillips a ball of indiarubber which is made there to a small extent for export. The mbungu fruit was only about half grown at the time of our visit. The gum-copal tree (called shakasi here) is said to be abundant in the woods adjoining the inner side of the wilderness, though I did not notice it, but it does not extend further inland.

Oil-palm trees, or "mchikichi," were noticed at wide intervals as far as Magila, where there is a tall one immediately below the hill on which the mission house stands. The east coast variety of this palm differs in nothing from that of the west excepting in the smaller size of the kernels; but on Pemba Island the trees are numerous enough to make these plums a considerable article of export. From the tree at Magila the owner makes oil for cooking and lighting. The coco-nut seems to cease with the first outlying range of mountains, or as soon as the sea-breeze is shut off; but beyond that the banana becomes very abundant, and its unripe fruit, boiled and threaded on the twigs of bushes to dry in the sun, forms the staple food of the highlanders. Thus prepared, the banana acquires a flavour very like that of the potato.

After a day's delay at Pangani, we were obliged to be content with a very small and filthy dhow to carry us back to Zanzibar.

Notes on the Geology of Usambara. By J. THOMSON.

LYING, as our route did, across grass-covered plains, and over forest-clad mountains, it may be well understood that our insight into the internal structure of the country consisted but of glimpses, yet I am convinced that they are sufficient to convey a general idea of the geology, and in that belief submit the following remarks.

The following formations came under our notice:—(1) Recent—alluvium of the Pangani; (2) Tertiary—two raised sea beaches; (3) Carboniferous—sandstones and limestones; and (4) Metamorphic—gneiss.

Taking these in the above order, we have then, in the first place, to consider the recent deposits. The alluvium borne down by the Pangani has in process of time raised a long triangular piece of swampy ground on the north or left side of the river. At its broadest part it will be about three-quarters of a mile, and in length about two miles. The sea has at the same time been busy, adding bank after bank of sand, until a large portion has been added to the alluvium slightly raised