

TANGANYIKA NOTES AND RECORDS

<i>List of Articles</i>		Page
The Delta of the Rufiji River	<i>R. de la B. Barker</i>	1
The Retreat of the Kilimanjaro Glaciers	<i>W. Gillingier</i>	7
Some Historical Notes on East Africa	<i>Arthur E. Robinson</i>	21
The Meteoric Iron at Mbosi	<i>Frank Oates</i>	44
Native Materia Medica	<i>W. D. Raymond</i>	50
Pole and Fuel Plantations and Windbreaks, Kwimba District	<i>C. J. W. Pitt-Schönkel</i>	55
Indonesian Echoes in Central Tanganyika	<i>A. T. and G. M. Culwick</i>	60
Details of a Native Medical Treatment	<i>Hans Koritschoner</i>	67
The Aba-Ila of the Tanganyika Territory		
Some Aspects of their Tribal Organizations and Sleeping Sickness Concentrations	<i>J. E. S. Griffiths</i>	72
The Menelik Legend	<i>Rev. R. Rensch</i>	77
The Story of Mbega	<i>Abdullah Homidi (translation by Roland Allen)</i>	80
Notes		92
Book Reviews		111
Correspondence		116

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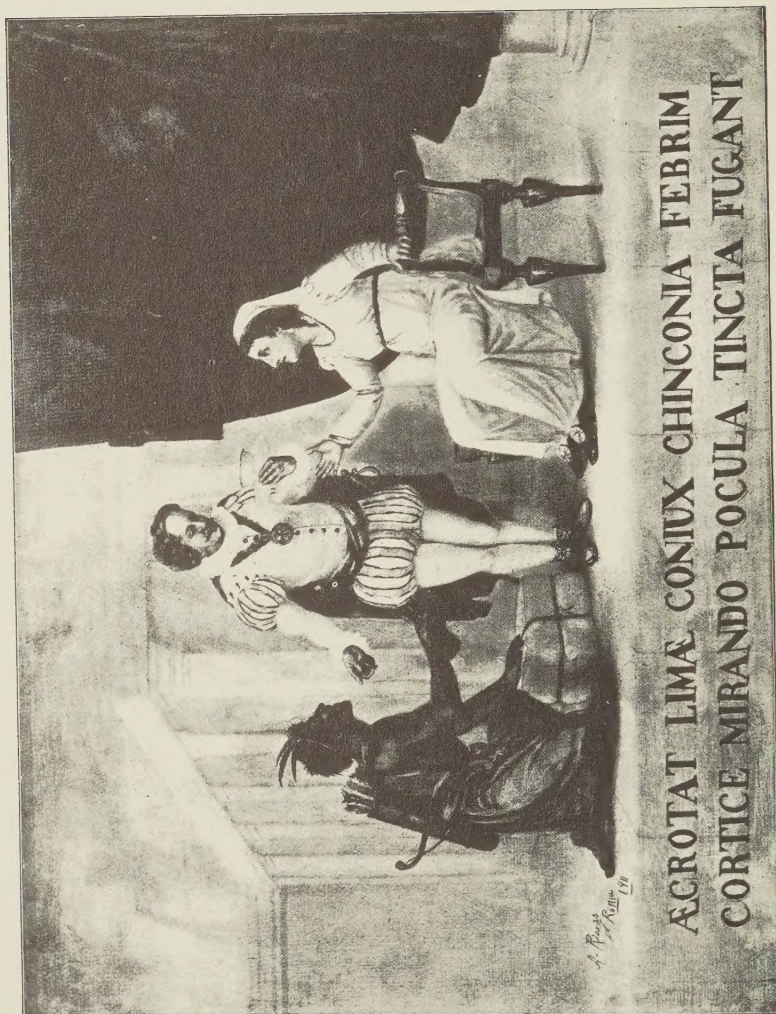


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<i>Contents</i>		Page
The Delta of the Rufiji River	<i>R. de la B. Barker</i>	1
The Retreat of the Kilimanjaro Glaciers	<i>W. Gellinger</i>	7
Some Historical Notes on East Africa	<i>Arthur E. Robinson</i>	21
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Cure of the Countess of Chinchon (A.D. 1638)
(See page 50 "Native Materia Medica" by W. D. Raymond)

Editorial Note

IN introducing the second number of *Tanganyika Notes and Records* may we once again appeal to all who are interested in the future success of the Journal to support it by sending in contributions for publication, whether in the form of articles, notes, memoirs or queries.

The successful reception of our first number is an indication of the need for this type of journal in Tanganyika and it is up to all of us therefore to see that it is not allowed to languish from lack of support. To those who have helped to fill the first and second numbers we extend our grateful thanks; but it is patently unfair to expect them to contribute to every number and this appeal is addressed to those who have not so far "rushed into print."

The Delta of the Rufiji River

By R. de la B. Barker

OUR oldest colonists in Tanganyika are the Arabs and Persians. A thousand years ago they were settlers near Kilwa and two of their ninety-nine mosques are still standing. As traders they still come every year in fleets of dhows bringing dates, dried fish and cloth for sale in Zanzibar and Dar es Salaam. When the monsoon or trade wind turns, they sail away to their far corner of our Indian Ocean laden as a rule with mangrove poles from the Rufiji Delta. In loading these poles they spend from a week to a month lying at anchor in the various tidal arms of that great system of waterways which divide the vast mangrove swamps into countless areas large and small.

Mosquitoes swarm on the dhows and sleep is a fitful effort, yet these traders brave the discomfort every year. They are hard-bitten men in fact and they know, as do forestry experts, that the timber products of the Rufiji Delta are practically unique in quality and quantity available. Even trade depression and the post-war prices held high by government tax or royalties upon the cutting has been unable to discourage these primitive craft sailing thousands of miles down the seas to collect this hard wood which is durable to a degree.

The extraordinary extent of these swamps can be judged by the fact that one man, who possessed the greatest experience in the delta, was once lost for three days and nights in a vast forest of delta trees during 1924. By taking his bearings from the rising and setting sun he was able to reach the sea on the third day and signal to a passing dhow. A subsequent manager of the timber concession explored the area under his authority for five years and was merely filled with ambition to ascertain more of its geography and timber contents. He longed for a trip over the delta in an aeroplane from which he could take photographs and make sketches as well as mental notes.

We are all taught at school that "delta" is the fourth letter of the Greek alphabet; and I believe that the similarity of that drawn letter to the shape of the Nile Delta led to its universal use in naming the wonderful natural result of rivers with heavy annual spate depositing at their mouths banks of mud over ages of time until vast swamps and islands are formed, more or less in a triangular shape.

The dimensions of our Tanganyika delta of repute are roughly fifty miles by thirty by ten to-day. About five hundred thousand, or may be fifty thousand, years ago (not even the geologists know) the delta was as symmetrically shaped as the Greek letter in print, but the more western arms then leading to its up-river apex are now blind. They are filled in at their sources with banks of alluvial sand and only connect with the Rufiji river

to-day when abnormal annual spates or floods come. Because there is no push of up-river water in them to hold up ocean tides they are tidal to a point much further west than is the river proper. The Mohoro Creek is thus tidal surprisingly far inland and the fortnightly service of deep water supplied by spring tides enables dhows to load grain and produce in the very midst of a large agricultural area.

Every spate season makes remarkable changes in both the river and delta. Little bays become sand banks and are sometimes soon covered with vegetation, and deep channels are scoured out elsewhere. On each island of the delta the sea is encroaching at one place and receding at another. A man may build himself a house beside the sea and find in five years his sea view is obstructed by high sandhills overgrown with green creepers and bushes.

At Salale the efforts of both Germans and British to preserve the water-front are futile and piers, growing trees, grassy banks and high earthy shores are slowly but surely devoured by the fierce floods of spring tides washing and lapping with strong sea winds behind them. The debris of their relentless activity is quickly carried away by the currents of the Rufiji and the auxiliary ocean tides to be dumped further east, so that the delta gradually increases her thrust into the domains of the sea. Ras Dima and Ras Twana are already very striking promontories and I suppose when another lakh or two of years have elapsed the Rufiji spate and the coral polyp will have succeeded in their co-operative effort to join the mainland to Mafia Island.

Well within the delta I have seen most remarkable natural plantations of valuable seedlings spread out on mudbanks left by the last spate. The seeds floated there and were left by falling tides. Before the next springs they had got a fortnight's rooting into the mud and held their territory against the following tides. By the time the next Rufiji spate appears their roots will have strengthened their adopted mudbank into an island or swamp status. So is born a valuable forest of the future.

One might imagine that nature can hold her own against the denudation resulting from the axe but elsewhere in the world it has been found that where forests are felled not only timber grows scarce but land erosion sets in, turning fertile lands into barren wastes. The rainfall is visibly affected as well. So that where forest timber is cut for commerce a compensatory planting must be done to ensure reafforestation in the future.

The Forest Department of this Territory has planted up many suitable areas in the delta which are steadily growing. This activity has a double advantage over allowing nature to take her haphazard course. Those species of mangrove trees most desired for trade are planted and the less useful seedlings which drift upon the mud by chance are weeded out.

Some delta trees drop small seed darts like aerial torpedoes which drive deep into the mud and so are not washed away by the flow of the tide. Each species has its individual seeding and self-planting process.

In 1933 a steamer-load of enormous hard wood logs was cut and sent to Dar es Salaam for pier piles. In penetrating far within the dark depths of

dense delta jungles the manager of the concession was astonished at the size, straightness and height of the trees hidden by the unpleasant barrier of mud, high interlaced roots and bottomless channels scoured deep by the flow and draw of high tides.

Crocodiles come down with the fresh water of the rainy season Rufiji, whose countless tons of waters push back the sea till one may drink from the side of a canoe almost anywhere. During the dry season the great saurians lie in dozens on sand banks near Usimbe, the south-western apex of the delta.

Hippopotami also like the delta and some seem to prefer the salt water to fresh. They eat the leaves of *michu* trees where they can reach them, usually at high tide. The buds of these trees are the favourite food of monkeys who are the commonest of delta animals and are heard and seen on all sides.

They are pretty blue monkeys and very tame, often sitting on trees above one's head watching the canoe pass by. Sometimes they are eating and do not even pause in their process of plucking buds and biting pieces off slowly and seriously like a child eating a bun. Canoes may come and canoes may go but meals are important, engrossing occupations with these pleasant, attractive animals.

Bird life is very much in evidence and on some of the islands the variety and crowded condition of the birds is quite astonishing, affording infinite entertainment to observant eyes and ears. The barriers made by surrounding swamps and sea arms seem to cause this congestion.

The delta has a dozen mouths whose waters are pushed out to the north and south of Mafia Island creating curious ocean streams of sharply contrasting colours. During flood time in the river the outgoing tides are of great force and pace, compelling dhows to put out as many anchors as they can handle, sunk in diverse directions to prevent dragging and the swinging of the vessel. One of these strong tides took two of our gallant naval officers so far out to sea when they were trying to escape from enemy territory on a raft during the war, that they were lost to our searches. One was eventually taken prisoner by the Germans while the other was drowned. A very imposing though solitary monument lies to the memory of the latter on the sandy south head of Simba Urunga entrance. Tall casuarina trees stand near by and hum and harp in the wind as though playing an everlasting and sadly impressive requiem.

Besides timber there is a valuable commercial product obtained throughout the delta in the nature of bark for tanning. This is cut from *mkoko* trees whose high roots often encrusted with sea-shells spread out like the feet of a many-footed monster of evil, octopus-like in appearance. The wood is not so valuable as *mkandaa* but the trees grow to larger sizes and frequently bark stripping also yields very fine timber for which a market should be found.

Weird as these roots of the *mikoko*, *mikandaa* are the beds of sharp spikes growing from the mud and closely placed like bristles. They are several inches

high as thick as a finger and fortunately soft for they are in fact aerial roots gathering air properties denied the roots deep in waterlogged mire.

The ooze of mangrove swamps is an unpleasant muck in contact, sticking close to skin and cloth. The best way to cross it is by running quickly on the flattest feet nature or artifice has endowed. I often wonder if those wooden "pattens" used by estuary fishermen in England would be of use. Where venturesome white men have sunk to their waists in the fearful filth in trying to reach interesting trees I have seen a spread-footed native race over the same surface to catch his canoe escaping with the tide.

Bare-footed natives walk over the sharp shaped aerial roots with never a flinch and any one in rubber shoes may do so, bending down the resilient spikes in the process.

The *muchu* grow less straight than the rest of the delta woods but in much heavier and bulkier trees, affording good material for making furniture and small canoes. The *mikomafi* are somewhat similar at first glance but are redder on the trunk, higher and straighter growing. Their cut lengths fetch high prices.

Natives live at various places in the delta where spring tides permit sandy islands to remain dry, and earn their necessities of life by cutting timber and fishing. Most of them also grow rice on the higher lands west of the delta, spending the planting season there or leaving their women to watch the rice while they follow their pursuits a few hours away by canoe.

All these islands in the delta are planted more or less with coconuts, which flourish and furnish a profit in copra as well as supplying a relish to be eaten with rice. The green coconuts are frequently felled and presented or sold to visitors who drink the coconut milk. It is a very cooling and healthy beverage whereas water from wells is brackish and probably infected with dangerous microbes.

The climate is not unpleasant between May and October, but from then on the heat is most oppressive even when strong trade winds are blowing. Fever is not so common as on the mainland but stamina is soon reduced and none but the brave and strong can stand the delta for long.

Sailing in small boats is the first sport to suggest itself when the numerous wide waterways and land-locked sea arms present themselves to the pleased new arrival. Enchanting exploration remains for him beyond the joys of sheer sailing, and fishing is a further fascination.

The big game fisherman may capture shark and saw-fish who, in flagrant defiance of the demarcations of their habitats made by learned scientists, not only leave the salt water but travel fifty miles or more up the fresh water Rufiji river at certain times of the year. Large red crabs live in the mud channels and banks where they are caught at low tide by natives and sold or given to the visitor. At the right time of the year they are fat and delicious. The females often carry their weight again in pink spawn which is as nutritious as it is captivating in taste.

Before the river rises between February and June flocks of ducks afford good shooting near Usimbe, and at all times reedbuck and bushbuck may be hunted in the grasslands and swamps respectively. These bushbuck who live in the dismal mud-floored forests, browse from the lower foliage of various trees and are only seen at high spring tides when the water drives them upon the small islands. In the swamps man is so noisy in his passage that they are never approached and only their tracks are seen.

It is very strange yet true, that lions from the mainland swim over the wide waterways on occasion and hunt bushpigs or devour goats and sheep. Monkeys also swim from island to island or swamp to swamp, braving the lurking crocodile and defying the word of book-naturalists that monkeys would sooner go through fire than water.

Among the narrow waterways walled in by the dense masses of swamp forests, echoes are eerie and yet entertaining. A distant axe blow reverberates hollowly through the delta dungeons, if I may so describe the dark spaces deep beneath heavy tropic growth and interlacing limbs.

Another impression not easily forgotten is the picture painted by a low sun when a tall-masted dhow flashes its snow-white sail of tremendous spread and sweeps close to vivid green foliage growing along the edge of deep blue water. Some of these Arab and Persian vessels are two hundred tons in burden and their sudden appearance far within the delta waters is a thrilling sight after the eyes have grown used to dug-out canoes as the local water-craft.

The crews of the traders are sometimes all black men, probably liberated slaves, and they appear a very happy, well-disciplined crowd. After rowing the *nahodha* or dhow captain ashore with oar strokes timed by drum and triangle, these lusty blacks stand on the thwarts and dance in carefree chorus, singing and clapping their hands. When back on board I saw them leap as smartly to their needle-work or mat weaving and sit in rows under the shade of bulwarks busy and happy, chatting away to each other like children on an outing.

During the war no dhows came but after the Treaty of Versailles nearly one hundred Arabian and Persian vessels came for timber with one monsoon. Not half that number come now and the difficulty these trade-wind dhows encountered this year in selling their cargoes of dates and cloth in Zanzibar, Mombasa and Dar es Salaam delayed their arrival at the delta. The monsoon changed in March this year* and probably prevented many vessels arriving. The concession owners obtained small profit, if any, in consequence.

On the sterns of the dhows are heavy fishing lines set for sharks and *samaki nguru*, which are, I believe, barracouta. These latter are very nutritious and oily. They are easily preserved by adding salt and form a staple relish for the rice and grain dishes eaten by the Arabs.

One cannot conclude the subject of the Rufiji Delta without mention of the remains of the German cruiser *Königsberg*, now very corroded and broken,

* 1935.—(EDITOR.)

lying in the northernmost arm about twelve miles from the sea. High spring tides almost submerge the wreck which lies about forty yards from an extensive and salty mud flat free of mangrove jungle and usually dry, giving overland passage to the mainland. In fact it is curious that books and records about the search for and costly and laborious destruction of the German raider failed to note that she was really a sick ship with defective engines who by the help of strong tides reached this spot in the delta where she could gain dry land communication with the mainland and obtain necessary supplies. A large plantation about ten miles away was her shore station in a sense and there the dead were buried after the final bombardment by British monitors.

German history recently revealed that the commander of the *Königsberg* intended landing his defective machinery and sending it overland to Dar es Salaam for repairs. This explains his stolid stand when he might have changed his position at every tide.

History, could it speak, might tell us of other vessels hiding in this natural maze of waterways, and the discovery of ancient treasure in Zanzibar during excavations for stone and for building lead one to wonder what lies under the sand of the numerous and often secret islands in the Rufiji Delta. Captain Kidd is said to have been in these waters and landed on Mafia Island. The old dynasties of Kilwa Kisiwani, where ruins of majestic nature remain, may have known queer stories of pirates concealed in the delta, braving the mosquitoes as the Arabs and Persians do now.

The Retreat of the Kilimanjaro Glaciers

By W. Geilinger

THE following notes are intended to continue Professor Fritz Jaeger's summary of Kilimanjaro's glacial history and may, it is hoped, illuminate the considerable changes of the Kibo glaciers within the recent past. A stay of many months on Kilimanjaro and repeated ascents during a period of six years have made a more or less continuous observation possible and have furnished photographic material specially suitable for comparisons, as repeated exposures were taken at various intervals from the same spots. In all six larger expeditions have been carried out: on the 3rd January, 1929, to Gillman's Point on the eastern crater edge about 5,800m.; on the 12th December, 1932, eastern slope of Kibo above Kibo hut, 5,100m.; on the 26th December, 1932, Kibo northern slope from Rongai about 4,000m.; from the 28th December, 1933, to the 6th January, 1934, eastern slope of Kibo up to near the crater's edge about 5,800m.; traverse of north and western slopes of Kibo (guide Dr. R. Reusch); on the 20th November, 1934, saddle plateau 4,500m.; the 23rd February, 1934, Kaiser Wilhelm Peak (K.W.S.) 6,010m. (according to more recent calculations of Gillman 5,965m.); ascent of the author with his sixteen-year old daughter, the youngest of all Kibo climbers.

Mount Kilimanjaro in northern Tanganyika Territory between 2°45' to 3°25' southern latitude and 37° to 37°40' eastern longitude carries three extinct volcanoes on a broad base, the biggest diameter of which is nearly eighty kilometres: Mawenzi 5,355m. strongly eroded and ragged in the east; separated from this by the saddle plateau of 4,000 to 4,500m. height Kibo, 5,965m., only superficially disintegrated and westward adjoining the wide crater of Shira 4,005m., which on account of its inferior height is orographically of less importance. Most probably on account of a subsidence a cauldron of two to five kilometres diameter and about 200m. deep has been sunk into the broad, round cone of Kibo which contains in its north-westerly part a rather flat secondary cone of eruption with its own small crater.

Apart from a small valley glacier on the south-western slope of Mawenzi only the high towering Kibo carries an extensive cover of ice of a type characteristic of the glaciation of isolated mountain peaks. The but little grooved cone is covered by a huge cap of ice, which is divided downwards by larger or smaller ribs of the mountain into glacier lobes of the type of hanging glaciers. The position of this cap of ice is oblique. In the north-east its border reaches only slightly below the edge of the crater, whereas in the south-west it descends as far down as 4,550m. This oblique position of Kibo's icy coat is due to meteorological causes.

CLIMATOLOGY.

The climate of the part of East Africa in which Kilimanjaro rises is essentially caused by the two seasonal winds: the south-east trade wind and the north-east monsoon. The moist south-east trade wind, which has passed over the Indian Ocean brings the great rains (March to September) with a maximum rainfall from March to May. The north-east monsoon, on the other hand, which is relatively drier on account of having made a longer journey overland, produces by its condensation the small rains from November to February. After the effects of these winds have passed off, dry periods occur at more or less regular intervals—in summer December to March, and in winter August to November. KLUTE has proved beyond doubt, that in the higher region from about 4,000m. upwards the dry anti-trade wind blows from north-east during May till October.

Into this meteorological system rises the towering mountain range, surrounded by a wide area of sub-arid steppes. This does not only create an obstruction, which prevents the winds from passing to the leeward, but causes deviations of the air currents, which are of great importance. The north-westerly part of the mountain receives the maximum of its rainfall from the north-east monsoon, that is to say, during the "small rains" (November to February), whilst the opposite side gets the "big rains" of the south-east trade wind (March to May). This quantitative difference of rainfall is one of the reasons of the ice-cap's obliquity.

The high region of Kilimanjaro penetrates into the zone of the anti-trade, which blows from the north-east over the saddle plateau and the peaks. As the leeward part on the south-west is not touched by it, a counter current is sucked up which deviates the south-eastern trade wind into a south-westerly direction and carries it high up the mountain. It is through this deviation that the south-west winds bring from the lower regions the main rainfall and, in addition, a continuous protection by clouds against the evaporating effects of the sun. These clouds rise on the south-western slope to different heights. Any one who stays on Kilimanjaro for any length of time can observe how regularly and generally already in the early morning the mountain is covered from its south-western bases by rising clouds. If by noon these clouds rise still higher on account of their getting warmer they reach the region of the relatively dry anti-trade wind which changes their fate. They are either dissolved by it or driven away to the south. The anti-trade barrier at a height of 4,000 to 4,500m. (Klute) has thus not been passed and above the cloud-covered lower regions reigns unveiled sunshine. But it is also possible that, with the upper current's strength diminished, the barrier region lies higher or has entirely disappeared. In this case the cumulus clouds, no longer piled up to close masses, rise up to 6,000m. and higher and, enveloping the summit, stick to it and are precipitated in the form of snow. The fact that LANGE has found a butterfly on the ice of the crater's edge shows clearly that these condensations come from lower regions. This frequently repeated formation of shade and the snowfalls in the south-west of the upper region are undoubtedly of great

significance, even though the days on which the trade wind and with it the cloud covering do not go farther than 4,000 to 4,500m. predominate by far. It is of special importance, that this cloud cover is formed at noon and during the early afternoon, that is at a time when the radiation of the sun, then standing over the glaciers in the south-west, would otherwise display its strongest power. On the other hand, the east of the mountain is unprotected in the morning hours, when there are no clouds. In summing up one can say that the oblique position of Kibo's ice-cap inclined from north-east to south-west is due to the larger precipitation over the south-western high regions as well as to frequent cloud covering, which protects against the sun.

Since Professor Hans Meyer made his first observation in 1887, the glaciers of Kibo have been constantly receding except for local increases of ice, which as regards size are of no importance. Already after only nine years the same explorer could observe an intensive melting during his third ascent of the mountain. He calculated that the glaciers of the Kibo crater ought to have disappeared within twenty to thirty years, if they were to diminish at the same rate as within this short period! Even if this prognosis has not been verified to its full extent the continuous shrinking of the ice, accentuated especially in the most recent past, seem to point towards at least the possibility of a complete disappearance.

In the following, the glaciers of the outer slopes and of the crater will be reviewed separately. This will not only make matters clearer but is advisable on account of their different behaviour with regard to the melting process.

THE GLACIERS OF THE KIBO SLOPES.

1. THE NORTHERN AND EASTERN SIDES.

In comparing photographs of these glaciers taken from below it is not possible to state with certainty changes of the ice masses which cover the crater's edge. The eastern outline of the Ratzel glacier too does not show changes of any importance. The considerable distance makes it impossible to distinguish details. But the more important comparison from nearby, from the entrance of "Johannes notch," shows an almost complete constancy between 1929 (NILSSON) and 1935. Only the steps of ice on the precipice of the east glacier are somewhat deepened in 1935 and the otherwise intact and smooth surface is a little hollowed out at its lower edge. The rim of the northern glaciers which but slightly overlaps the crater's edge and the outline of the somewhat larger glacier of the slope, to the east of the centre of Kibo, have remained the same.

2. THE SOUTHERN SIDE.

The southern flank of Kibo, with a slope of 35 to 40 degrees, is covered by a compact coat of ice which from about 5,200m. downward is divided into a number of broad, lobed slope glaciers. From east to west these are called Ratzel glacier still trending south-east, Rebmann, Decken and Kersten glaciers descending due south, and Heim glacier which bends to the south-west.

*Survey of the Glacial Changes from 1904 to 1930 (according to Jaeger).—*In 1904 the firn area of the outer southern glacier on the rim to the north of the summit was visible from the Johannes notch (UHLIG). From the same point of observation the outer Kibo ice behind the southern crater wall was no longer visible in 1927 (MOSTERZ). This points towards a considerable decrease in height within twenty-three years. A further regression in the following three years is proved by the air photographs of Mittelholzer taken in 1930. The snouts of the Rebmann and Decken glaciers, which were originally connected are now separated and have almost completely melted away. A rock, rising in the middle of the Rebmann glacier, which was formerly isolated is now connected with the ridge along the glacier's edge. A change in the surface characteristics of the glaciers had not become visible until 1930.

Glacial Changes from 1929 to 1936.—In December 1932 no change was noticeable on the southern glaciers and a somewhat peculiar dirty grey colouring of Ratzel glacier noticed in December 1933 was unfortunately not attended to in the rush of the ascent. In November 1934, however, a profound destruction, noticeable even at a distance and with the naked eye, appeared on the firn which in 1932 had still been completely intact and smooth. The surfaces of the whole of Ratzel and Rebmann glaciers and the eastern half of Decken glacier look corroded and have a somewhat disturbed aspect. A formation of ice steps more or less horizontal and parallel has taken place in such a way that the easterly slopes have been affected decidedly more than those lying in the shadow of the morning sun. The fact that in the middle of this large melting zone the south-westerly parts of the upper Rebmann glacier have retained their smooth glacial surface seems to be of special significance. (Fig. 1.)

This ablation of the surfaces appears to be a further and very obvious phase of a general regression which manifests itself primarily in the shrinking of the ice masses. A comparison of the photographs may serve as an illustration of these phenomena. A view from K.W.S. towards the south-eastern wall of Kibo crater shows the following:—

1928-29: Panoramas of Nilsson and Rice.—The firn fields of the south-east and south glaciers rise everywhere clearly visible and uninterrupted with smooth surfaces above the crater's edge. They can also be traced between the rock pinnacles of Gillman Point, the Bismarck Towers and Stella Point where, to the west of the last-named, they form a smooth-edged accumulation of ice.

1935: The decrease in the thickness of the ice on the south-eastern outer slopes cannot be denied. Stella Point rises considerably higher above the ice wall, which between the Bismarck Towers and Gillman Point has disappeared but for a just visible speck. The accumulation of ice to the west of Stella Point has been reduced to a much disturbed and levelled-down remnant. (Fig. 2.)

Thus there exists an evident and rapidly increasing area of ablation, which within six years has resulted in a considerable reduction of height and, within the last two years, in a marked melting of the surface of the southern glaciers.

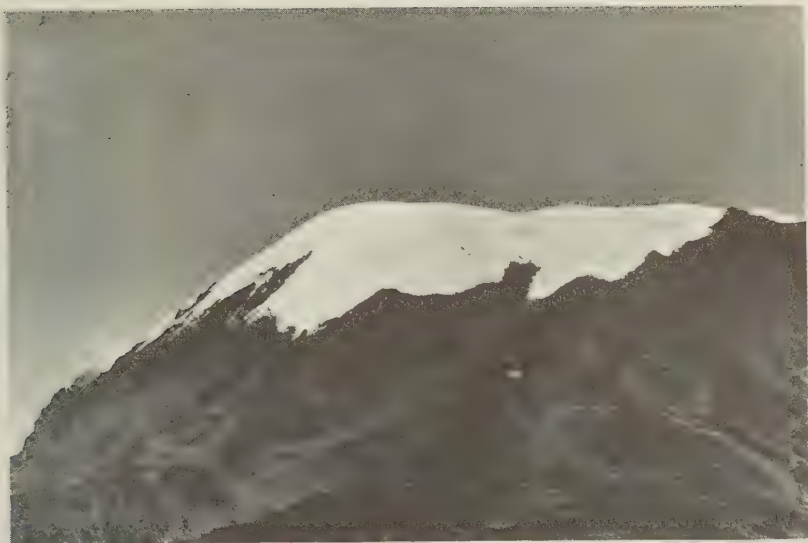


Fig. 1—Surface melting on Kibo's southern slope glaciers (20.11.1934).

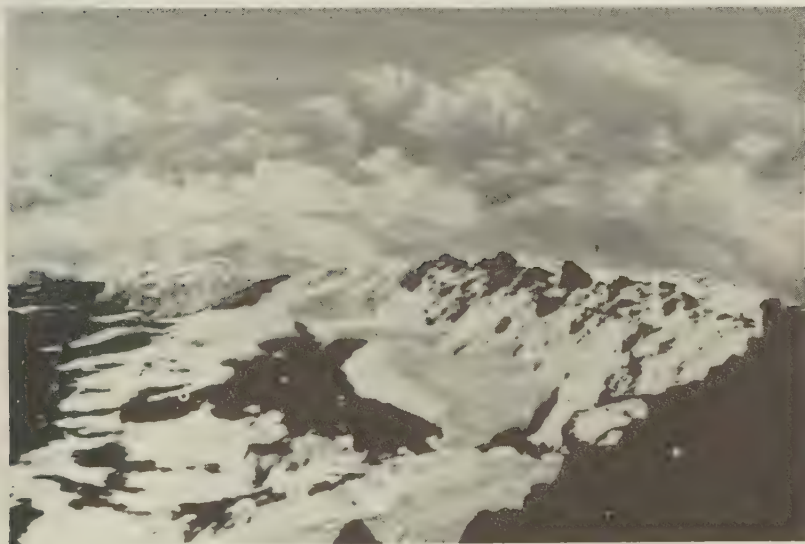


Fig. 2—View into Kibo Crater from southern rim showing reduction in height of the southern slope glaciers (23.2.1935).



Fig. 3 — Reduction in length of Baranco glacier in the western breach
of Kibo (5.1.1934)

Conformable with its probable causes—solar insolation through absence of a cloud cover in the forenoon and the strong effect of the anti-trade regime—this area seems to expand from east to west.

3. THE WESTERN SIDE.

In January 1934 we were lucky enough to catch a glimpse, from the western basis plateau at about 4,000m. and under the best meteorological conditions, of the west-south-western side of Kibo. Here the great western breach or "baranco" in the mountain's flank renders the orographical features more accentuated. According to Klute this deficiency is due to erosion, whereas Meyer's earlier theory calls in tectonic forces to explain its origin. The picture by Oehler of 1912, interesting as comparison, has been taken from a standpoint but slightly further south and somewhat more distant.

The glacial covering is briefly as follows: On the still visible south-western slope the western part of the Heim glacier stretches to the steep wall of the breach. Inside this latter lie the three parallel Baranco glaciers. Out of the ice carapace to the north of the "breach" develop the largest glaciers of Kibo, the Penck glacier, whose upper part surrounds the "breach," and the Drygalsky and Credner glaciers projecting more to the north-west. The last of these is not visible in the photograph.

As far as can be stated from such a distance, the extent and configuration of the Heim glacier have remained constant and essential changes of its outlines are not discernable. The great glaciers to the north of the "breach" are, however, receding without doubt. Within six years the Penck glacier has receded 9.5m. (JAEGER and OEHLER 1906). The rocky patch which probably already in 1912 had somewhat expanded (the so-called Ravenstein) is constantly increasing (MITTELHOLZER 1930). In 1934 it appears even more molten and thinned out. Above the Drygalsky glacier, on which Klute could not observe any signs of retreat in 1912, two rocks which had not been visible before have appeared, and the Credner glacier, which formerly (H. MEYER 1898) had been double-pointed, shows in 1903 three tongues (KLUTE) the third of which is in 1930 more distinctly isolated from the glacier (MITTELHOLZER).

As regards changes caused by regression the Baranco glaciers are most impressive. It is difficult to decide if the general diminution of 1934 is a real one or whether snow lying in the "breach" in 1912 accounts for a certain deception. A considerable reduction of their length is certain. (Already in 1912 Klute was able to state that the end of the great Baranco glacier had receded 10 to 15m. from its last moraine.) Twenty-two years ago its upper ends lay clearly higher on the Baranco back wall close to the foot of its uppermost steep slope. By 1934 they had moved back towards the bottom of the "breach," the distance between them and the upper border of the "breach" having increased considerably. (Fig. 3.)

The explanation for this marked receding is to be found in the fact that the former connection between the feeding area of the ice masses inside the crater, the so-called western crater-glacier which then extended into the

Baranco (H. MEYER 1889), has been destroyed. The small remaining tongue, which still descended into the uppermost part of the "breach" (LANGE 1909, OEHLER 1912, MITTELTOLZER 1930), was still in existence in 1934 but is of no importance.

A connection with the Baranco glaciers is out of the question. They have become independent "dead" glaciers of the outer slopes for whose shrinking the area of ablation in the crater is primarily responsible. (See below.)

The Regression of the Glaciers on the Outer Slopes and the Climate of the Lower Region.—Based upon thorough researches H. Meyer and Klute agree that "the periods of rainfall in the high zones coincide with the rainy seasons of the lower slopes." Thus the heaviest snowfalls occur on Kilimanjaro during the two rainy periods of the year. The maximum of rain falls in the forest belt at about 2,000m. The rains diminish with increasing height, changing more and more into snow. On the summit probably all precipitation takes place as snow. At 3,000m. the amount of rainfall has been estimated as only about 600mm. (according to Klute from this height upwards the character of the vegetation is decidedly xerophilous). In the high region (zone of the anti-trade wind from about 4,000m. upwards) the sides exposed to the winds receive most of the rain, but precipitation is less on the north-eastern sides than in the south-west where the clouds protected from the anti-trade rise. The highest zones most probably get their rains evenly from all sides (KLUTE).

Though the intensities of precipitation in the high and lower regions seem to differ frequently and to be relatively independent of each other (KLUTE 1901 and 1906) a comparison of the amounts of rainfall at different stations on the lower slope, compiled since 1929, with the respective state of the glaciers on the slopes of Kibo at the end of the year, seems to signify a certain parallelism of the yearly averages. The figures of the last five years (for which I am indebted to the British East African Meteorological Service, Nairobi) seem to indicate the following events:—

Apart from the rainy season 1932 a constant decrease of rainfall from 1930 to 1934 can be observed in the east of the mountain (Rombo 317mm.); a similar decrease has taken place in the south-west (Boloti 425mm.); west (Ngare-Nairobi 294mm.) and especially in the drier north-east (Ngare Rongai 520mm.).

Even more accentuated is the decrease shown in the south (Kibosho 2,635mm.). The remarkably large figures of rainfall at this station for 1930-32 have been doubted by the central meteorological station at Nairobi, but the missionaries are convinced of the correctness of their figures.

This period of diminution of the rainfall in the east coincides with the visible decrease of the height of the glacial covering of the south-east, indicating a gradual reduction of the glacier's mass that the heavy rainy season of 1932 has not been able to prevent. The drought period which was particularly pronounced in the south in 1933-34 has had clearly visible effects in the high regions. Whereas by the end of 1932 the surfaces of the glaciers still appear intact, the beginning of the process of ablation can probably already be

recognized a year later and, by the end of 1934, had made immense progress. It seems to be more than accidental, that the decided scarcity of rainfall on the south of the mountain within the last two years coincides in time with the melting of the southern glaciers.

THE NOTCHES IN THE EASTERN ICE MANTLE.

Perhaps the best indication of the climatic changes on Kilimanjaro are the gaps, the so-called "notches," which have formed in the eastern ice wall of the Kibo crater within the last forty-eight years of observation.

Survey of the Development of the Notches from 1887 to 1929 (after Jaeger).—The notches of the eastern ice wall which represent defects caused by the melting process, are of recent date. The first photograph by Professor Hans Meyer, of 1887, shows an uninterrupted ice mantle in the east. Only at one point a slight hollow is shown, which developed later on into the northerly H. Meyer "notch." Even in 1889 nothing but a slight impression appears yet rock is already standing out of the ice in its upper part and in 1898 the explorer can only reach his "notch" by cutting steps in the ice. In the same year Major Johannes discovers a little further south another ice-free gap, which later on was called after him Johannes "notch." H. Meyer's earlier map of 1890 shows only one notch, his later map of 1900 two.

Six years later a considerable change had taken place. In 1904 Uhlig finds both "notches" entirely free of ice. For the first time in 1912 Klute proved the existence of three "notches" which he called, from north to south, Meyer, Johannes and South "notch." This naming is in so far deceiving as in comparing Klute's map with the sketch of Rice, which is topographically incontestable, it becomes clear (as Gillman has pointed out) that Klute's "south notch" is in reality the "Johannes notch" and that what he calls "Johannes notch" has developed as a new gap between the two older "notches." It has been called "Leopard notch" on account of Reusch's surprising discovery of a frozen leopard's carcass there in 1926. (As neither Gillman (1921) nor Latham (1926) on their subsequent ascents mentioned the [non-existing] "south notch" Jaeger arrived at the wrong conclusion that this "notch" had since closed up.) We do not know the age of this "Leopard notch."

As it is still very narrow (according to Rice's map its width is about two-thirds of that of "Johannes" and only one-sixth of that of "H. Meyer's notch") one is probably not far wrong in considering it the youngest and most recently added gap.

We have, therefore, since Professor H. Meyer saw the eastern ice wall for the first time, the picture of an uninterrupted* melting which continued

*The comparative examinations of photographs by JAEGER seem to prove that a transitory increase of ice took place in the "Johannes notch." Two darker layers of old snow of the precipice towards the "notch" 1909 (LANGE) which are probably identical with two equal layers 1904 (UHLIG) have been over-covered on the side towards the crater by concordant layers of old snow which admits the existence of a feeding area. In 1921 (GILLMAN) the upper layers on the side inclined towards the inside of the crater are no longer concordant but have become cuneiform. This seems to speak for a renewed melting off.

also after 1912. In 1921 Gillman finds the "H. Meyer notch" not quite free of ice and Latham in 1926 mentions a considerable melting off.

The shrinking of ice is shown most instructively on the magnificent perpendicular wall of the northern glacier in the "Johannes notch." Whereas Uhlig (1904) finds hardly any melting off on this ice-wall, practically no icicles, and its cornices covered with snow, the picture of Mosterz (1927) shows that, though these features have remained the same, they have increased in size, through a considerable reduction of the ice.

The Development of the "Notches" from 1929 to 1935.—In 1929 we noticed the same state of the ice-wall of the "Johannes notch"—a stratification of small steps and numerous pillars of ice. After six more years a strong diminution of the ice has become obvious. Apart from the pillary structure having deepened and the whole relief of the ice-wall having become more accentuated masses of ice have disappeared. This is shown by the fact that the cornices have been deepened and their more resisting ice covers are partly overlapping. The behaviour of the accumulation of molten water inside the notch at the foot of the ice-wall is likewise different. It has not only increased noticeably, but the masses of old snow, surrounding it six years ago, have disappeared on the north side of the reservoir, which now everywhere abuts direct on to the glacier. (Fig. 4.)

On account of an access of fatigue and increasing symptoms of mountain sickness an intended visit to the other "notches" could, unfortunately, not be carried out in 1935. For this reason only the photographs of the "H. Meyer notch" from the K.W.S. are available for comparison with the beautiful crater panoramas of Nilsson (1928) and Rice (1929). The changes which this gap has undergone are most astonishing. A formerly small piece of rock free from ice and snow and having the form of a ribbon in a superficially smooth depression in the eastern ice-wall has been replaced by a deficiency of about double the size. The masses of ice bordering thereon are in a state which may be compared with the melting off of the glaciers of the outer southern slope. The edges of the ice are unevenly stepped and dissected by deep cleft-like fissures. The whole body of the glacier has been destroyed to such an extent that the formerly smooth and rectilinear descent to the notch can hardly be recognized any longer.

This most impressive retrogression of the ice inside the notches is accompanied by the formation of a new and consequently fourth notch in the crater's southern ice-wall about 200m. to the west of Stella Point. The position corresponds with the one where Rice in his map of 1932 noted a bowl-shaped subsidence, which can be clearly recognized on his panoramic view. This notch, though clearly defined, is not yet general, the underlying rock not being as yet free from ice and snow. It is surrounded by vertical ice-walls which seem to be on the point of forming a structure of cornices and pillars. For this, the smallest of all existing deficiencies on the crater rim, the name of "south-notch" might be proposed. (Fig. 5.)

The development of this notch resembles on a smaller scale that which started the "H. Meyer notch" about forty-five years ago.

There also exists a certain parallelism between the retrogression of the glaciers on the southern slopes and the progressively increasing melting off of the notches, inasmuch as both seem to extend in the direction of the anti-trade wind, a process evidently accelerated by the drought of 1933-34.

This can be illustrated by the following comparison :—

- 1887. Ice mantle uninterrupted. Slight depression on the spot of the future "H. Meyer notch."
- 1889. Deepening of the eastern ice depression, appearance of rock in the upper part.
- 1890. Only one notch in existence, "H. Meyer notch." Map of H. Meyer 1890.
- 1898. Two notches in existence for the first time. "H. Meyer notch" not yet entirely cut through. "Johannes notch" free of ice and snow.
- 1900. Two notches in existence. Double interruption complete. Map of H. Meyer 1900.
- 1904. Two notches in existence. Both notches fully developed (UHLIG).
- 1912. Three notches in existence for the first time, the central "Leopard notch" having appeared. Map of Klute 1920.
- 1928. Three notches in existence plus the beginnings of a southern ice depression; panorama of Nilsson.
- 1929. Conditions have remained unaltered. Map and panorama by Rice.
- 1935. Four notches in existence. The southerly depression has developed into a notch. The ice has not yet entirely melted off and this notch forms the smallest defect.

Thus, the history can be summed up as follows :—

- One notch during eleven years (1887-1898);
- Two notches during fourteen years (1898-1912);
- Three notches during twenty-three years (1912-1935);
- Four notches since 1935.

THE GLACIERS OF KIBO CRATER.

At a height of about 5,700m. even in the tropics one might expect Kibo crater to be an excellent feeding area, forming an ideal reservoir of ice for which the "West Baranco" would provide a suitable outlet (JAEGER). Actually, however, the opposite has taken place and there exists a pronounced area of ablation, which is not of recent date, but has evidently been intensified within the most recent past. Though the reasons for this development are not yet clear, several essential determining causes may be recognized, which have here led to and are maintaining a shrinking of the glaciers, even surpassing in intensity that of the outer slopes.

In the first instance there are the local climatic conditions. To-day and evidently already for a long time, Kibo crater is situated within the sphere of action of the north-easterly winds which in themselves are unfavourable to precipitation. On account of the barrier of the anti-trade (KLUTE) the south-west winds which bring the rain and with them the clouds, as protection against the sun, "hardly enter the crater" (JAEGER); in any case not to such a degree that they might be able to balance the glaciers' budget. One could clearly observe this in February 1935, when powerful clouds of the trade-wind rising at about 9 a.m. from the south and floating upwards with great rapidity on the southern slopes of Kibo, stopped immediately below the crater's edge. During the whole time of our ascent, i.e. for about four hours, they remained in the same position. The conditions on Kibo crater, lying on the border of the feeding and ablation areas, are entirely labile (JAEGER). Small changes may result in the prevailing of one or the other regime and thus produce either the formation or the destruction of ice. As the crater of Kibo consists of a horizontal area sunk only superficially into the mountain's summit the formation of an area of ablation is also favoured orographically. Contrary to the glaciers of the outer slopes whose inclined tracks are only struck by the rays of the sun in an oblique and therefore less powerful way, inside the crater the sun's rays strike vertically and therefore with full force. This variation of the conditions of insolation are considered by Nilsson as an important reason for the quicker melting off of the crater's glaciers as compared with the outer masses of ice.

The question whether a remainder of volcanic heat might be responsible too for the regress of ice inside the crater (JAEGER) cannot yet be answered. Certainly no traces of still existing volcanic activity have been observed. The sharp, well-preserved edges and the steepness of the inner crater on the other hand point towards its recent origin. But an ice cover originating soon after the extinction of the volcanic activity might have acted as an excellent protection against disintegration (GILLMAN).

*Survey of Glacial Changes from 1889 to 1927 (according to Jaeger).—*In 1889 the eastern part of the crater's bottom is covered by a smooth glacier and on the lower eastern flank of the central cone expands a uniform mass of ice (H. MEYER). Nine years later the ice in the crater, which already in 1889 no longer appeared quite intact (places with horizontal stratification on H. Meyer's sketch), shows craggy cliffs of ice on its surface and the glacier of the east flank has become thinner.

By 1901 the indicated defects have changed into holes with concordant stratification of ice and everywhere an intensive melting off is shown (UHLIG). Up to 1927 no decided changes take place, apart from the varying cover of snow (UHLIG 1904: less snow on the slope of the crater; LANGE 1909: more old snow; LATHAM 1926: much snow on crater bottom) and of a further diminution of the firn as observed by Gillman in 1921. The holes in the ice of the bottom of the crater have considerably widened and a new ice-free spot has been added (MOSTERZ).



Fig. 4 — Johannes Notch in eastern ice wall (23.2.1935).



Fig. 5 — Formation of the fourth notch in the south-eastern ice wall (23.2.1935).



Fig. 6 -- The ice masses in the eastern part of Kibo Crater (3.1.1929).



Fig. 7 — Deficiencies and formation of "penitentes" on the eastern crater ice (23.2.1935).

Glacial Changes from 1929 to 1935: 1929.—1. The firn surfaces of the eastern crater ice are smooth and only in their upper layers which are most exposed has slight dissolution taken place.

2. Four deficiencies are in existence, two smaller ice holes in the north and two larger ones in the south. Apart from the most northerly one, which has already melted down to the crater's bottom, their fairly smooth walls have not yet reached the foundation.

3. The mass of ice on the south-eastern slope of the central cone showing three holes has been strongly dissected and is connected with the glacier on the bottom by a broad ice bridge. A considerably narrower connection exists also with the northerly ice masses of the "Johannes notch."

4. In the northern part of the bottom glacier rises a massive ridge of ice towards the "Johannes notch." Its south-western slope shows a smooth surface; the south-eastern slope, exposed to the morning sun, shows but superficial corrosion but no deep-reaching ablation. (Fig. 6.)

1935.—1. The surface of the eastern bottom ice is in a state of strong ablation which is shown by the formation of most strongly-marked craggy rows of ice (so-called "penitentes"). It is significant that the part lying on the deepest and therefore most protected point of the crater is still coated by an intact covering of firn.

2. A noticeable change has taken place in the holes. All of them have increased considerably in size. This is shown most clearly in the narrowing of the separating ice masses. Their steep walls are now covered by deeply modelled cornices and pillar structures. The edge of the most northerly defect, which already in 1929 was but small, has been destroyed and the neighbouring ice-hole has entirely penetrated to the rock. (Fig 7.)

3. The mass of firn on the southern slope of the central cone has been reduced in height to about half and is divided in its northerly part into "dead" remnants of ice. Its southern end shows new big holes. The impression is created that these masses of ice are on the point of being dissolved entirely. The bridge towards the ice on the crater's bottom has been broadly divided and the connection to the ice of the "Johannes notch" is destroyed. Its central part has become a craggy remnant of ice, isolated on all sides.

4. The ice ridge rising from the northern edge of the bottom glacier has become an irregular craggy mass deeply intersected by erosion furrows. Its height has been considerably reduced since 1929. (Fig. 8.)

The phenomena of retrogression of ice in the eastern section of the crater within the last six years surpass by far the similar processes during the much longer period from 1901 to 1929, both as regards intensity and rapidity. Within the most recent past an unmistakable acceleration has set in. At a cautious estimate, the bare area of the crater visible from Gillman Point has been doubled during the last six years. Most strongly affected are those glaciers whose body was disintegrated already in 1929 by holes, chasms and the formation of "penitentes." The enlargement of their surface thus created, the missing protection of a reflecting smooth surface, and the absorption and

reflection of heat of constantly increasing areas of bare ground are working hand in hand and result in an accelerated effect. The deleterious effect of these agencies is best visible on the large and isolated remnant of the glacier, situated some way up the southern slope of the central cone, the so-called "Ice dome."

THE "ICE DOME."

On this block of ice, bounded in 1889 by perpendicular walls, appears in 1898 a tower-like tooth on its southern end caused by the melting out of a notch (H. MEYER). This deficiency becomes deeper (UHLIG 1901 and 1904, LANGE 1909) and at the same time the southern end of the remaining glacier diminishes (VON SALIS 1914, MOSTERZ 1927). Steps of ice formerly lying in front of the eastern side have disappeared (JAEGER).

The process of reduction has likewise become more acute within the period from 1929 to 1935 as the following notes will show:—

1929.—1. The raised middle part of the "Ice dome" is still covered by a smooth surface.

2. Between the firn covering and the eastern wall a well-formed edge exists.

3. Remnants of the eastern frontal steps are still existing.

4. Southern end: the profile stoops step-like towards a lower frontal step.

5. Northern end: greatly reduced in height, far drawn out.

1935.—1. The firn of the central parts has mostly disappeared. The surface has become unevenly denuded.

2. The eastern wall is being rounded off.

3. The eastern frontal steps have vanished. A big ice grotto has become visible.

4. Southern end: the frontal step is missing. The south end is falling off steeply and has been reduced by the amount of the former frontal steps.

5. Northern end: a melting through has taken place, resulting in the separation of its extremity which now stands isolated. The distance between the northern end of the "Ice dome" and the more highly situated masses of ice has increased, mainly at the expense of the latter.

All these changes can also be confirmed by looking at the "Ice dome" from the southern rim of Kibo crater. In doing so, it appears that on the western side, which has now become visible, a melting process has set in, which even surpasses the one on the eastern side. (Fig. 9.)

1928-29. (*View of the "Ice Dome" from the K.W.S. panorama of Nilsson 1928 and Rice 1929*).—The walls of the western steep precipice of the "Ice dome" do not fall off straight, four semi-circular ablation deficiencies having developed as bays into the glacier's body, between which the ice projects in palisades. Between the almost intact cover and the precipice stretches a sharp edge (NILSSON).

1935. (*View of the "Ice Dome" from the south rim a little in front of H. Meyer Point*).—The western bays have experienced so considerable a deepening that the "Ice dome" as a whole appears considerably narrowed. The southerly deficiency reduces the glacier's body to a narrow ice-wall. The



Fig. 8 — The ice masses in the eastern part of Kibo Crater (23.2.1935).
(Compare with Figure 6.)

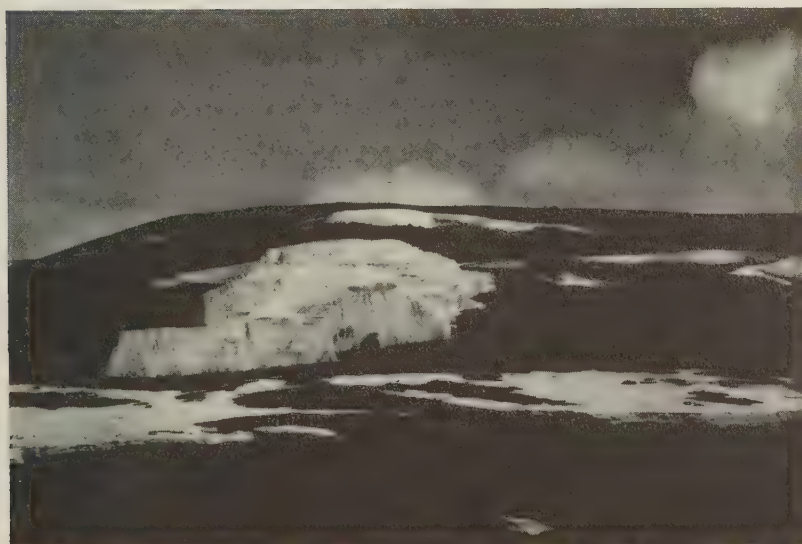


Fig. 9 — The "Ice Dome" seen from the south (23.2.1935).



Fig. 10 — View of Kibo Crater from H. Meyer Point, showing westerly shrinking of "Ice Dome" and widening of H. Meyer notch (23.2.1935).

separation of the southern end appears imminent. This will probably be followed by a melting through of the adjoining bay, where by rounding of the relief (disappearance of the edge) a considerable reduction in height has already taken place. (Fig. 10.)

A regional preference regarding the retrogression of ice, similar to that observable on the glaciers of the outer slopes, does not exist inside the crater. The reason for this may be that the anti-trade wind which dominates the summit renders more or less illusory the formation of sufficient precipitation and the protection by clouds that are so effective on the southern slopes. The intensity of the melting process in the south-western part of the crater is not less than that in its south-eastern part.

THE WESTERN GLACIER OF THE CRATER.

The history of this interesting glacier is shortly as follows (according to JAEGER): In 1889 it begins immediately on the "Ice dome," separated from it only by a narrow strip of ice-free rock. With straight walls it stretches right into the west Baranco (H. MEYER). Twenty years later this is still the case, but the glacier now enters the uppermost part of the breach only with a small tongue, of no importance as regards the outer Baranco glaciers. The southern steep borders have been deeply gnawed into by clefts and bays, in front of which lie isolated masses of ice. On the surface the layers of firn peter out towards the periphery, which also seems to indicate a strong melting off (LANGE 1909). The "Ice dome" and glacier of the western crater are still more or less connected in 1928 by masses of ice (NILSSON), which have disappeared twelve months later.

In 1929 the glacier starts with steep ablation walls on the southern slope of the central cone, now separated from the "Ice dome" by a large area free of ice (RICE 1929, MITTELHOLZER 1930).*

Unfortunately, none of the pictures of 1935 includes the glacier of the western crater and the "Ice dome" at the same time, and it is therefore impossible to compare the further behaviour of the gap between the two. The "dead" blocks between these glaciers, still existing in 1929, have disappeared. The melting off of the steep eastern precipices has increased; they are more gnawed and rounded, in parts the formation of ice grottoes has become visible. As shown first of all by the considerable increase of the distance between the "Ice dome" and the eastern edge of the western crater glacier from 1889 to 1929, the reduction of the masses of this glacier has become considerable.

The melting-off process of the immovable masses of ice in the interior of the crater, which are spread more or less horizontally, is shown in the formation of terraces on the firn layers of unequal resistance and in the formation of vertical clefts; frequent also is the separation of "dead" units which, being

* The year 1928-29 has brought forward an astonishing retrogression. It also led to an extensive separation of the masses of ice on the north wall of the breach and the west slope of the central cone which early in 1928 were still connected.—(GILLMAN.)

exposed on all sides to the powers of ablation, disappear quickly (JAEGER). In these altitudes the shrinking of the ice is the result of direct radiation (temperature of the air mostly below freezing point, KLUTE) and of the great evaporating power of the thin and dry atmosphere, which immediately absorbs the melting ice, so that a run-off of water only rarely occurs. On this account the formation of icicles is but small and glacier brooks are entirely wanting.

Perhaps at one time the entire cauldron of Kibo was filled with ice. The crater's glacier and the "Ice dome" would in this case represent the relics of a once uniform mass. The comparison of the existing photographs and panoramas shows clearly the process of ablation of a formerly much thicker ice-filling of the crater, progressing with time.

Since the time of their first discovery the glaciers of Kilimanjaro have been in a constant regression which small and passing advances have not been able to stop. It is probable that the earliest and most intensive ablation started on the ice lying in the Kibo crater. Then came the turn of the glaciers of the outer slope (NILSSON), where the reducing process set in and is since proceeding across the southern glaciers in an east-westerly direction. An increased diminution of the crater's ice, within the last two years of drought, seems to keep pace with the intensified and accelerated shrinking of the southern glaciers during the same period.

The vanishing of the ice depends upon solar radiation. It might be conceivable that the disturbance of the glaciers' regime is somehow connected with alterations in the rate of this radiation, with variations in the numbers of sun spots, or in the activity of the sun as a whole. Or perhaps we are drawing near to the quickly approaching end of the last quaternary ice-age or are in the dry phase of a climatic cycle of a more recent period.

Should the climatic conditions which have existed for the last fifty years continue, one might be justified in concluding that the ice within the crater may disappear entirely in decades to come, followed later on by the disappearance of the glaciers on the outer slopes.

Some Historical Notes on East Africa

By Arthur E. Robinson

THE purpose of these notes is to bring to the attention of those officials and residents who may be interested, the chief sources of our present information regarding the territory formerly known as "The Land of Zenj." This extends from Cape Guardafui to the port of Sofala. The present political divisions of East Africa are not tribal and although the Limpopo river may have constituted a great natural frontier between certain races in the past, Sofala was regarded by the early Moslem voyagers as the southern frontier.

Prior to the Moslem era, the Arabs of the Arabia of Muhamad were not a maritime race, and after the control of the Red Sea passed out of the hands of the dynastic Egyptians until the Ptolemaic era there was a distinct Asiatic influence. The vessels were apparently manned by Phœnicians and sailors from the Persian Gulf. It was not until the translations, made by order of the Caliph Mamoun (813-833), of the works of Ptolemy the Geographer, Euclid, Archimedes, Aristotle *et alia*, were generally accessible that any charts or itineraries of the great sea routes to and from the Persian Gulf and the Red Sea were compiled. This information was temporarily lost in Europe for several centuries, during which our knowledge of the East African coast and Asia was obtained from narratives of European travellers by land or in Asiatic vessels⁽¹⁾.

For the purposes of a brief summary East African history may be divided conveniently into the following periods:—

- (a) Pre-historic.
- (b) A period contemporary with the pre-dynastic and dynastic Egyptian kings.
- (c) A Persian-Greek period, 525-50 B.C.
- (d) A Roman Colonial period, 50 B.C.-A.D. 600.
- (e) A Moslem period, A.D. 600-1400.
- (f) A Portuguese period, A.D. 1400-1800.
- (g) A period of European development, A.D. 1800 to date.

(a) PRE-HISTORIC.

As far as East Africa is concerned, and more particularly Tanganyika, field research is merely in its infancy and offers a great opportunity to all in the Territory. There is a growing opinion that finds of stone implements in Africa are valueless without some detailed evidence regarding the sites, stratification, etc. Palæolithic objects are carried great distances by African rivers in flood and Abyssinian pebbles found in the Nubian cataracts have been identified by Dr. Sandford and Mr. Grabham⁽²⁾.

Sir Harry Johnston stated that stone implements and weapons had been found in the Bahr el Ghazal and Zambesi basins and described them of Palæolithic and Neolithic types. In France the term neolithic is only applied to polished stone articles as distinct from the chipped. The finds mentioned by Sir Harry included axe heads (one head broad), barbed and plain spear heads and double-headed axes pointed at each end. He has compared them with similar types found in the Congo⁽³⁾. An Abyssinian Dolmen described in *l'Illustration*, Paris, 30th May, 1925, may be any date 2000-500 B.C. A very fine rock-drawing of a giraffe was illustrated in a weekly journal recently which was discovered in the rocky bed of a dry East African river. No claim was made for its antiquity, but I believe that German officers reported some near the eastern shores of Lake Victoria which have not been published. It is doubtful if the terracing in the Rift valley described by Captain Wilson⁽⁴⁾ is older than the first millenium before Christ, when a great shortage of rainfall occurred over a considerable belt of the earth's surface (c. 700 B.C.)⁽⁵⁾. Such cycles of drought caused by diminished rainfall and low flood levels appear to have occurred at intervals of about a thousand years all over a belt which extends north of the Equator. Unfortunately the practical study of historical physiography has not received the attention from archæologists which it should have done in the past. There is ample scope for any observer who would make simple cuttings in the banks of dry rivers, record the strata and then the subsequent flood levels.

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(b) A PERIOD CONTEMPORARY WITH THE EGYPTIAN RECORDS,
i.e. PRE-DYNASTIC AND DYNASTIC.

Although the use of metal was known to the early dynastic and perhaps later pre-dynastic Egyptians, the Delta was deforested by means of the stone axe⁽⁶⁾. Metal implements and weapons were not in general use until the third dynasty (c. 2980 B.C.), which is stated to have been founded by Sudan negroes from the south of Lower Nubia. Metal tools were used side by side with flint implements until about the twelfth dynasty. Beyond the Egyptian frontiers in Africa there is no definite line of demarcation between the stone and metal ages. The use of copper does not appear to have been universal and some tribes have passed direct from the use of hardened wood, bone, horn, etc., to iron. The results of recent extensive excavations of Saharan tombs, etc., have been remarkable for the absence of copper articles.

Any knowledge of the use of flint articles was lost in Europe and in medieval times it was the practice to attribute supernatural agencies for the manufacture

* N.B.—This does not include authorities (figures in parenthesis) cited in the Appendix.

of flint arrows which are worn as charms by the Berbers⁽⁷⁾. Travellers invariably took the Bible or Koran as their historical or anthropological hand-books with the result that Hebraic or Arab culture was generally found where it was sought for. After the translation of the Rosetta stone and the great development of Egyptology during the last century medieval tendencies changed to one of comparison with the ancient cultures and place names of Egypt. Thus the influences of Asiatic cultures became over-shadowed by those attributed to the Nile valley civilization. Both the cow-cult and the mother-goddess are common to both the continents of Asia and Africa and as far as Europe is concerned any survivals would appear traceable to Asia. The more recent discoveries in Crete and Mesopotamia which have revealed ancient civilizations of a more advanced character than those of Egypt due to the use of metals have caused much that has been written prior to the last decade to be discredited now⁽⁸⁾. The archaeologist in East Africa is therefore entirely dependent upon such historical knowledge that we possess and has no recognized ancient civilization upon which to base the results of his researches. French authorities now consider that as far as Africa is concerned the deductions of anthropologists are incompatible with the facts disclosed by post-war excavations, literary and linguistic researches⁽⁹⁾. They do not consider similar African cultures as being synchronous with one another or comparable with those of Europe.

Our present knowledge of the periods at which metal ores have been smelted is principally derived from the reports of miners and prospectors. Sir Richard Burton considered that the third century of our era was the finest in the history of Indian iron or steel manufacture. Sir Harry Johnston who had exceptional opportunities for forming an opinion was unable to decide upon any period between the first millenium before Christ and the Christian era for the date of the introduction of smelting copper ore in Africa. The smelting of iron presents greater difficulties as very high temperatures are necessary and an ample supply of fuel near the mines. Meteoric iron cannot be hammered cold as natural copper was worked. Meteoric iron fractures into small pieces through brittleness. In view of the foregoing our knowledge of the history of East Africa for about fifteen hundred years is restricted to the records of Egyptian voyages to the "Land of Punt." These voyages via the Red Sea extended over a period from the fifth dynasty (2750 B.C.) to the end of the twentieth dynasty in 1090 B.C., when we have no more records for some years during which the ships of King Solomon sailed from Akaba to Ophir.

"Punt" may be the name given to a gradually extended coastline which was developed and explored by the Egyptians. It seems to have commenced somewhere about Agik, where it is probable that Khor Barakat was a more or less permanent stream, to some unknown site on the Indian Ocean such as Ras Khanseer or even Ras Hafun. There is no evidence to this effect, however, although Sir Flinders Petrie has identified Ha-Fun with Punt and claims that the ancestors of the present-day Gallas of Somaliland invaded Egypt and established an independent monarchy at Qau⁽¹⁰⁾. It was from this Galla line

(by the distaff side) that the great twelfth dynasty, which conquered the Sudan and occupied Dongola, he states the Kushites originated. As I had access to a number of little known books, papers and reports when in Khartoum I am glad to say that some of the information I collected is now proving of use to anthropologists engaged among the Gallas. The in-ports from Punt included



--- Ancient Eastern Migration
(Circ. 5000 B.C.)
..... Moslem Migration (Arab)
A.D. 700 to A.D. 1800
xxxxxx Galla Migration North-
West (Circ. A.D. 1500)

-.-.-.- Ancient South-Eastern
Migration also Sabacan
and Axumites to A.D. 500
nnnnnn Nubian or Kushite
3000 B.C. to A.D. 1700

+— Bantu Migration,
unknown era
----- Shilluk Migration A.D. 1500
and possibly Fung A.D.
1500

gold, incense, negroes, negresses, pigmies, cattle, goats and living plants. The pictures at Deir el Bahri on the temple of Queen Het-shep-set represent houses raised on piles similar to those in the Bahr el Ghazal. King Pa-rehu wears a pig-tail beard (characteristic of early dynastic rulers) and his wife, Ati, and daughters are distinctly steatopygous in type. Dr. Krapf was one of the first to describe the pigmies (from hearsay) and later Dr. Schweinfurth found them

among the cannibal tribes west of the Nile. Figurines of steatopygous women are common at most pre-historic and archaic sites and the cult is not restricted to Africa as the multi-breasted goddesses of India are another form of the same idea. The most remarkable thing is the survival of this fertility cult until the present day in Africa. When I was in Tunis thirty years ago it was the practice to diet young Jewesses and the dowry paid by prospective Hebrew bridegrooms was assessed by the weight of the bride. Jewesses were invariably veiled at that time in most Moslem countries and many native Christian females were more closely secluded than Moslems.

The last millenium before Christ was notable in the world's history for definite and continued pressure from the east by Assyria and Persia on Palestine, Arabia and Africa. The sites of Ophir and Tarshish (? Tartessus or Cadiz) have formed the subjects of conjecture for centuries. James Bruce prepared an elaborate map⁽¹¹⁾ by which he endeavoured to show that the port of Ophir was on the African coast at a site called Rhapta at the mouth of the River Juba, which is shown on the Ptolemaic map of East Africa published by the Royal Geographical Society. These views were the cause of the "King Solomon's mines" theory regarding Zimbabwé and the gold mining area in which it is situated. Miss Caton Thompson has dispelled any such ideas regarding the antiquity of these fortress towns but the evidence regarding the date when metal ores were first mined and the metal obtained by crushing or when gold was first washed from alluvial deposits are matters of controversy among experts⁽¹²⁾. King Solomon ruled from 975-935 B.C. and it would appear that the control of the Red Sea passed from Egyptian hands in consequence of the disturbed state of that country as voyages of Egyptian ships to the Lebanons for timber are recorded about that time⁽¹³⁾. The biblical story of the visit of the Queen of Sheba has been somewhat discredited by the various Abyssinian genealogies; most of which were prepared by medieval monks for European consumption⁽¹⁴⁾. The Arabs of Mesopotamia were driven east by the Assyrians. They settled near Petra and were ruled for many years by a line of Priestess-queens several of whom are mentioned by name on the Assyrian monuments. Evidences of Assyrian penetration in Arabia are afforded by inscriptions on the monuments which record that Tiglath-Pileser (745-727 B.C.) received tribute in 732 B.C.⁽¹⁵⁾ from the "Arabs in the west" of gold, silver, camels and perfumes from Tayma, Saba and Badana (in Madian), etc. Tribute was also recorded in 715 B.C. as received from Itamara of Saba, but in 703 B.C. the Arabs were driven to the oases of El Jol, Nefd, etc., and their queen deposed⁽¹⁶⁾. Their idols were taken away (later restored) and from that period can be reckoned a steady drift of nomads who displaced the cultivators and a race hostility which has existed until the present day. The Arabs of Muhamad are not aboriginal inhabitants of Arabia neither are the camel and horse indigenous. There may be a few semi-autochthonous people left such as the Mahra, Murra and other tribes described by Mr. Bertram Thomas, who live in remote districts in Hadramut⁽¹⁷⁾. Readers will find little to add to what I have written in the works of Et Tabari (the Livy of the

Arabs)⁽¹⁸⁾ or in the works of the Moslem historians. They are distinctly unreliable for any events prior to A.D. 570 (the year of the elephant) when Abreha the Abyssinian was repulsed from Mecca. Recent excavations at Hugga⁽¹⁹⁾ (thirty-one miles from Sanaa, the site of the great temple of Venus which was destroyed by the Moslems) revealed a stone-built town which had been occupied from 300 B.C. to A.D. 300. Mr. Huntingford has given the name of "Azanian Culture"⁽²⁰⁾ to the evidences of an exotic civilization found in Kenya which seems to be traceable in East Africa as far as the Limpopo. Although Dr. Glaser estimated the date of the founding of the Sabæan dynasty as about 800 B.C. there is no historical fact to go upon in fixing such a period. Thousands of inscriptions have been found and genealogies constructed but attempts at chronology have been hopeless except upon a rough-and-ready method of assuming that certain persons were kings and then counting the generations. It is notable that an artificial reservoir was found at Hugga with irrigation canals similar to those found at Kharij, Aflaj and Hirran in the Yemen by Mr. Philby and the great dam at Mariaba. They are of the type found near Merôé and which were described by Burkhardt and other travellers. These reservoirs clearly show that some climatic change necessitated the conservation of flood water. It is quite probable that excavation at some of these sites might yield coins similar to the Attic "owl" type copied in Arabia during the beginning of the first century of our era or the later Axumite varieties of the pagan and Christian rulers.

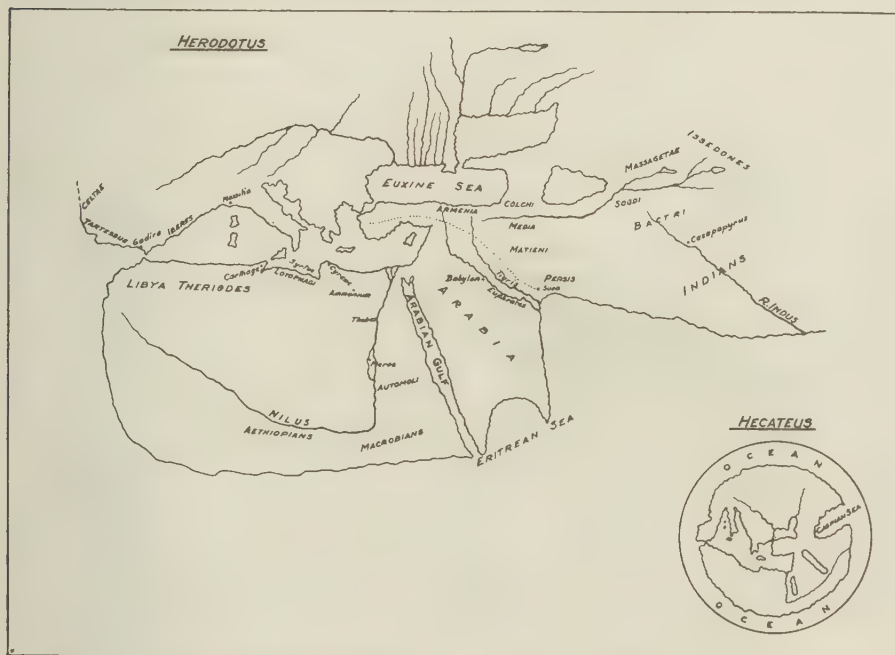
Much has been written regarding the Automoli as the ancestors of certain Hamitic African races. The Automoli were European and African mercenaries (Carians and Mashuasha) who had been employed by Psammeticus I (668-610 B.C.) to drive out the Assyrians from Egypt. The Mashuasha had been employed for a number of centuries as *gendarmérie* by the Egyptian kings and at one time acted as police at the Nubian gold mines. Some authorities consider they were Libyans, at all events it seems clear that considerable numbers of the frontiers garrisons deserted and went south to Merôé from Aswan and settled there⁽²¹⁾. The reputed circumnavigation of Africa via Suez and the Straits of Bab-el-Mandeb during a period of two years took place in the reign of Necho (610-594 B.C.)⁽²²⁾. The inscriptions at Abu Simbel attributed to the Automoli have been identified as those left by an expedition of Psammeticus II (c. 594-589 B.C.).

LITERATURE—Jas. Breasted: "A History of Ancient Egypt, and Records of Ancient Egypt." Geo. Reisner: "Harvard African Studies, etc." Wallis-Budge: "The Anglo-Egyptian Sudan," 2 vols. Articles and maps in the Journals of the Royal Geographical Society (1909, etc.), Soc. Geographique (Paris), Royal Asiatic Society and Royal Institute of Anthropology, etc.

(c) A PERSIAN-GREEK PERIOD (525-50 B.C.).

Cambysses occupied Egypt in 525 B.C. and most of the later events can be verified from sources other than Herodotus. During the reign of Darius the Arabs became independent again and sent gifts to the Persian king which

included one thousand talents of frankincense. Both frankincense and myrrh have been exported to Aden for many centuries but are generally considered as Arabian produce. Recent excavations at Adulis by Paribeni and Axum have revealed nothing of an earlier period than the Ptolemaic⁽²³⁾. I understand that Mr. Curle has carried out some excavations in Somaliland but the finds are not considered earlier than the Christian era. With the exception of a bronze arrow-head found by Mr. St. John Philby near a well in the Arabian desert there is nothing to connect his finds of early medieval beads, etc., with stone implements dated circ. 5000 B.C. on the same journey⁽²⁴⁾. The bronze arrow-



head may be subsequent to the Christian era as bronze articles and weapons were found at Zimbabwé and in the Sahara which are contemporary with medieval iron. With the exception of the Ptolemaic monument at Adulis the Axumite inscriptions are all subsequent to the Christian era. These have been collected and published by Mr. Kammerer. There are several papers by M. Louis Marcus, one of which deals with the Falasha. He states that between 643-330 B.C. a colony of ten thousand Jews was mixed with four thousand Syrian idolaters in Abyssinia who were eventually conquered by Greco-Egyptians about 90 B.C., but that soon afterwards the Jews became independent⁽²⁵⁾.

Darius developed the direct sea-borne trade from Egypt to Persia and Professor Breasted considers that the monuments on the Red Sea canal indicate

that regular voyages were made from the Nile to the Persian Gulf⁽²⁶⁾. We hear nothing of Punt so it seems probable that African produce was transhipped in Arabia. About 406 B.C. Euripides mentions Aden as Eudamon. Satisfactory evidence in regard to the pre-Roman origin of the Aden tanks has not been found yet or to show that they were fed by a supply of which the source has now been lost by destruction or neglect. During the sixty years represented by the twenty-ninth and thirtieth dynasties the Persians made several unsuccessful land expeditions to regain possession of Egypt. Both Champollion and Lepsius considered that temples in Nubia had been destroyed by the Persians but there are no records of any attacks via the Red Sea on the Nilotic



The World according to Eratosthenes (Circ. 200 B.C.).

population at that period. The reputed repulse of the army of Cambyses from Merôé by the Meroites under Nastasen is an extremely controversial question between the American and certain schools of British Egyptologists⁽²⁷⁾.

In 332 B.C. Alexander the Great occupied Egypt and his subsequent campaigns in Asia and the division of his empire caused a development of communications unparalleled previously. As soon as Ptolemy Soter (304-285) secured possession of Egypt he reoccupied the shores of the Red Sea and established a number of garrisoned posts there manned by Jewish prisoners under Greek officers. Mr. Crowfoot identified certain Ptolemaic sites in the "Elephant country"⁽²⁸⁾. The monuments which have remained since the times of Cosmas and other travellers have been fully described and the inscriptions translated and published. Ptolemy Eurgetes (247-222 B.C.) is reported to have

invaded both sides of the Red Sea and after marching to Tigré he returned to Adulis. The extraordinary phallic columns found in south-eastern Abyssinia and which are popularly ascribed to Muhamad Gragné are at present an archæological mystery⁽²⁹⁾. They may represent a Syrian culture traceable as the result of northern pressure in Arabia and the events which culminated in the Moslem control of that country, transmitted by a migratory people who have commingled with or absorbed people from the localities through which they have passed⁽³⁰⁾. The conservative and reactionary influences of women are very clearly exemplified in our own country where paganism was revived and Celtic art reappeared after the third century of our era at many Roman sites.

Most of our information regarding Ptolemaic geography is derived from Strabo (died A.D. 24) who accompanied the disastrous expedition of Cornelius Gallus in 25 B.C. as far as Syene (Aswan)⁽³¹⁾. Strabo's son was Prefect of Egypt until A.D. 31 when he was executed by the Emperor Tiberius. About 247 B.C. Eratosthenes (died 196 B.C.) was Keeper of the Alexandria Library. His description of Arabia and the lost works of other writers are cited by Strabo. The pillar of Sesostris alluded to by Strabo has not been found and the monuments found at Adulis are inscribed in hieroglyphics of that period. Strabo describes the Straits of Bab-el-Mandeb and the trade between the two continents which was conducted by means of rafts, and most of his information was used by Ptolemy. About 146 B.C. Eudoxius of Cyzicus sailed from Egypt to India and he is believed to have rediscovered Masira island. After the Persians evacuated Egypt the maritime trade with the east declined and navigation outside the Straits of Bab-el-Mandeb by vessels had practically ceased beyond the limits of the Ptolemaic garrisons. About 115 B.C. the Himyarites, a people of undecided origin from the extreme south-west of Arabia and who were possibly descendants of the Ptolemaic garrisons in Africa, seized control of southern Arabia from the Sabæans. The Beni Kahtan and other reputed autochthonous people became tributary and more or less absorbed into classes, hence the hillfolk (cultivators) and the coastfolk (nomads, fishers and traders)⁽³²⁾.

LITERATURE—Arnaud: in the *Jnl. Asiatique*, Paris, 1874. Didot's edition of Ptolemy, with maps, Paris, 1901. Devic (L.M.): "Le Pays de Zendjs," Paris, 1883. Glaser (Ed.): "Die Abessinien in Arabien." Gibbon (Ed.): "The Decline and Fall of Ancient Rome," 1844 edn.; for the extensive bibliography, much of which has not been translated into English. Johnston's atlas of Ancient History. Mueller (D.H.): "Himyarisch Studien," 1870, and "Sabaische Denkmaler," 1883. Josephus: "Antiquities of the Jews," etc. Basnage: "Histoire des Juifs," etc. Musil (Alois): "Arabia Petra," Vienna, 1907. Renan (E.): "Nabatean Agriculture" in *Mem. de l'Institut.*, Fr. Tome, 24, 1861. De Sauley: "Numismatique des rois Nabateans" (*Ann. Soc. Franc. Numismat. et Archæolog.*, vols. IV and V, 1873-4). Schlumberger (*Rev. Numismatique*, III, 4, 1886, pp. 356-71). *Mining Journal*. Quarterly Journal of Royal Meteorological Society. *Numismatic Chronicle* (1884, p. 205; 1917, p. 28; 1922, III and IV), etc.

be the descendants of Semitic fugitives from the Nile and Northern Africa⁽³⁴⁾.

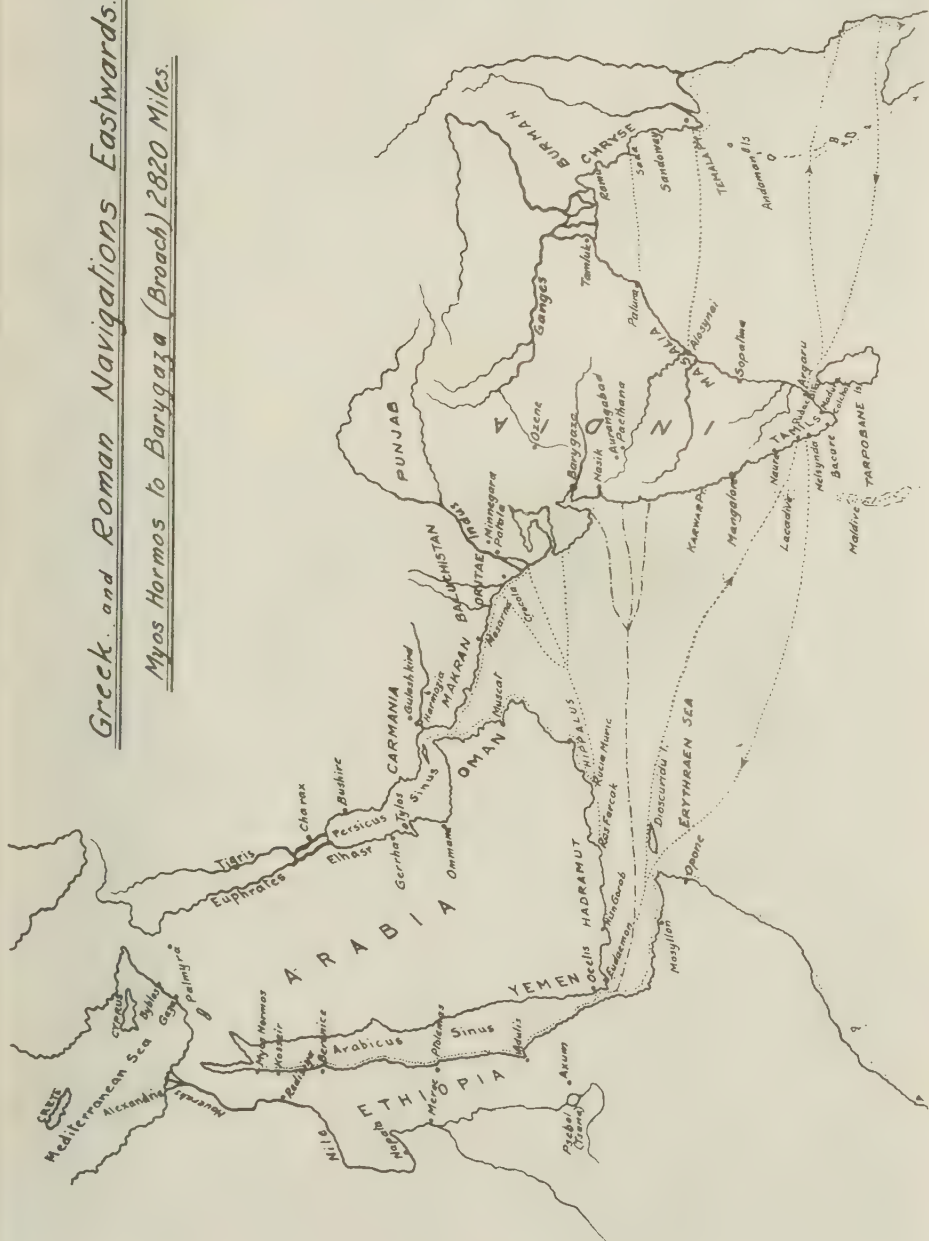
In 46 B.C. a giraffe (cameleopard) appeared at Rome in the triumph of Julius Cæsar. The destruction of the Egyptian fleet which had been carried across the Isthmus of Suez was the climax of the events which led to the Roman annexation of that country in 30 B.C. The expedition of Ælius Gallus was defeated by the duplicity of Obodas of Petra who was executed subsequently in Rome⁽³⁵⁾. About 20 B.C. an embassy from India interviewed Augustus but it seems clear that the Romans were unable to re-establish direct communications then with places outside the Straits of Bab-el-Mandeb without a costly expedition. Most of our information is obtained from the "Periplus of the Erythrean Sea," an anonymous publication of which there is an edition published in New York. During the reign of Claudius (A.D. 41-45) Annius Plocamus, a Roman tax-gatherer in the Red Sea, was driven by a storm to Hippari in Ceylon. He returned to Rome after an absence of two years with an embassy under Rachias, a native prince, and direct trade was initiated. The difficulties encountered are explained by the fact that the Romans destroyed Aden in A.D. 53⁽³⁶⁾ as it had become a nest of pirates although their vessels appear to have watered at Massowah and Suakim for some years later. M. Drouin⁽³⁷⁾ considers that the African coast was ruled by petty kings of Hamitic or negroid stock as far south as Rhapta, which he fixes as the island of Zanzibar. Sasou, which appears in numerous Axumite inscriptions, etc., may be southern Somaliland and extended as far south as Lake Rudolph. The stelæ in Abyssinia are considered to be obituary in character as distinct from the obelisks which are associated with sun worship. Both the stelæ and the obelisks have been identified with similar monuments in Arabia and Syria but they are not of great antiquity⁽³⁸⁾. The royal stool culture is represented by the Axumite stone thrones of the gods and kings. Philostratus (c. A.D. 200) has described the silent trade of Africa and it is repeated by Cosmas and many other travellers for centuries later. At the time that the Periplus was written Azania, the ancient Punt or Somaliland, formed part of the dominions Khairabæl of Saphar (eight hundred miles east of Mocha) the king of Himyar and Saba. The African territory (Ma-afir) was ruled by a governor and the relations with Rome were friendly. Afr is the country now called Adel and includes the desert and savage Dancali which can be identified by an Axumite expedition (c. A.D. 320-342) for which camels were necessary. The contemporary ruler of Axum with Khairabæl was Zoscales (? Za Hakale A.D. 76-89 or the Hegle of Ruppell). A Roman custom house for the African, Arabian and Indian trade was established at Pagus Albus Hawara (Medina) and this site has been identified with the silted up port of Yambo-en-Nakla about five miles from the coast. The first recorded direct voyage to India was made by Hippalus in A.D. 79 who sailed from Cape Fartak. The great hoards of Roman coins which have been found in India and Ceylon date from that period, and there is no reason why similar records could not be found in East Africa if they were searched for. About a year later Dioscuros reached Cape Delgado⁽³⁹⁾

and Pliny has described Aden as deserted in A.D. 89. The port of Adulis which is said to have been founded by escaped Egyptian slaves (see *ante*) had become the great transshipment port as the entrance to the Straits could be easily guarded against piratical vessels. About one hundred and twenty ships of from forty to eighty tons burden left Egypt each year about the end of June for the ports outside the Straits of Bab-el-Mandeb. They sailed with the monsoon and returned about December or January. Some of the vessels may have been larger but the Chinese were the pioneers in the big ship for ocean navigation. Pliny gives the value of the annual imports from India, etc., to Rome as a hundred millions of sesterces which Gibbon states was equal to eight hundred thousand pounds in 1776⁽⁴⁰⁾. These imports included silks and steel from China, diamonds and rubies from India, emeralds from the Red Sea and spices from the Land of Zendj. The question as to whether ginger and pepper were found in Africa at that time is controversial.

Petra was occupied in 105 by Palma, the Roman governor of Syria, who occupied Bostra and assumed control of the caravan routes. Another embassy from India reached Rome in 107 and about A.D. 150 Claudius Ptolemy published his geography of which I understand there is no complete edition yet in English⁽⁴¹⁾. Sixteen years later a Roman embassy reached China. Toba Asad (Abu Kariba), who ruled over the Yemen in the third century and covered the Qaaba at Mecca with a veil, attacked the Jews in Northern Arabia. He is said to have accepted Judaism before his death and encouraged teachers to settle in his territories. The rule of the Yemen passed to Rabia ibn Nasir of the Beni Iakma and the Beni Hamdam. Rabia ibn Nasir corresponded with Sapor I (240-272) and from that date the influence of Persia in Southern Arabia and East Africa can be traced in rivalry with the Axumites and Romans although representatives (ambassadors) figured in Aurelian's triumph (274). In 276 another embassy was sent from Rome to China. About the year 300 a king of Yemen named Thair raided Persia by sea. He took away as a captive the sister of Sapor II (then an infant) with many other prisoners and much loot. About the same time Theophilus, a native of the Maldivé islands, was sent to Rome as a hostage⁽⁴²⁾. During the reign of Constantine (306-337), King John of Abyssinia(?) is said to have divided his territory. Axum was given to Caius, a younger nephew, and Fatigar to Balthasar, another nephew, whilst Melchier took Giomedi. It should be noted that the Axumite inscriptions cannot be dated and that Tiyanna may be Damot in Abyssinia and not Tehama in Arabia as there are no vowels and the language was forgotten in the fifth century. As soon as Sapor (300-380) attained his majority he invaded Bahrein in revenge for the abduction of his sister. He attacked the Beni Bekr and Abdel Qais and marched via the Yemama to Yathreb (Medina) slaughtering and destroying all before him, before he returned. The Axumites then held the entrance to the Straits and he does not appear to have reached so far south. The relations between the Axumites who controlled the trade and the Romans were not friendly and about 327 a Roman merchant Meropius (Macrobius) was attacked

Greek and Roman Navigations Eastwards.

Myos Hormos to Barygaza (Broach) 2820 Miles.



and killed at Adulis. Two youths with him, Frumentius and Edesius, were taken prisoners to Axum. In 333 Frumentius was sent to Egypt on an embassy and whilst there was ordained by St. Athanasius as a bishop. He returned to Axum and the king accepted Christianity. This change in religion is clearly indicated on the coins by the substitution of Christian for pagan symbols. In 335 embassies from India and Axum visited Constantinople⁽⁴³⁾. It is possible that the destruction of the pagan kingdom of Meröe c. 350 was the cause of the embassy of Theophilus to Axum. He took two hundred royal Cappadocian horses from Constantius II (337-361) and demanded the expulsion of Frumentius as a heretic⁽⁴⁴⁾. Proposals to the Axumites to attack the Persians and open the Red Sea navigation to the Romans were declined. Theophilus established and built churches at Aden, Saphar and Sanaa and then left via the Hadramout for Ceylon and the Maldives, whence an embassy was received by Julian in 361. The traditional date on which Sanhat and Samanah the eponymous ancestors of the Somalis crossed from Arabia to Africa is given as c. 400. They were probably missionaries and illustrations of the ruined buildings in Somaliland, which were described by Burton, appeared recently in the *Illustrated London News*. Inscriptions in archaic Arabic have been found near Lake Zouai (Abyssinia) but the earliest known are about two centuries before Christ near Axum. Philostorgius, who wrote about 425, stated that the coast from the Axumites as far as Guardafui was inhabited by Syrians, and that the original inhabitants spoke the language of their country and were 'basanes' (i.e. sunburnt). He states that the Syrians were sent there by Alexander the Great, which it must be noted is before the Persian deportations referred to by the Moslem historians. The term Abul Karnani, frequently applied to Alexander the Great, was one given to a Yemenese ruler of the third century of our era and the names are frequently confused and misapplied. Pliny speaks of a campaign by Alexander the Great but the general evidence points to a long period of unrest during which deportation and emigration from Arabia to Africa seems to have been constant through political and physiological changes since the first millenium before Christ and which continued until the European occupation of East Africa. Marcus states that prior to A.D. 325 the Jewish king of Samem subjugated all the territory to the sea but after the introduction of Christianity and Islam his power declined. This seems to be borne out by the inscriptions reproduced in Montfaucon's edition of "Cosmas." Varanes V (420-440) is said to have occupied Arabia Felix in 421 when the Hinyaritic capital was moved from Mariaba (the site of the dam) to Sanaa after which there was a period of religious war between the Christians and pagans which lasted until the death of Muhamad.

The murder of the Christian prince Aretas at Nejran in 522 and the subsequent invasion of Arabia by the king of Axum about 530 have been described by Procopius, El Tabari and other writers. Ludolphus stated that the Abyssinians used four hundred and twenty-three ships to transport their elephants, horses and one hundred and twenty thousand men⁽⁴⁵⁾. The Axumite occupation of Arabia was ephemeral. A coin of Israel (a son of Ela Amida or

Elesbaas, the Kaleb (dog) of the Arabs) has been found. It was to Ela Amida of Axum that Nonnus, the Byzantine legate, was sent about 533 with a view to the opening of the Red Sea navigation⁽⁴⁷⁾ to vessels from Egypt to India and China as the silk trade was carried on across the deserts as Sir Aurel Stein has confirmed by his recent explorations in northern India, etc. The Abyssinians were ejected from Persia about 297 by the Persians as they never recovered from the loss of their army at Mecca in 570 by smallpox⁽⁴⁸⁾. The occupation by the Persians was preceded by a series of gross atrocities and religious persecutions which culminated in the destruction of the temple of Venus at Sanaa in 632 and the general payment of tribute by all except Moslems in Arabia. The Sumatran, Indian and other non-Persian mercenaries employed by the Persian king made a treaty with the Caliph Omar and although many of them joined the Tamim tribe in Mesopotamia, others became pirates and bandits⁽⁴⁹⁾.

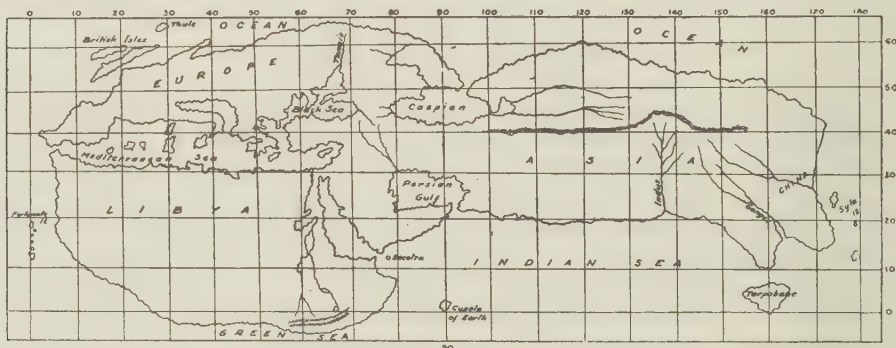
(e) THE MOSLEM PERIOD (622-1400).

The Moslem era dates from the flight to Medina (A.H. 1) in A.D. 622 from Mecca by Muhamad who died in 632, but it was not until the caliphate of Omar (634-644) that Islamic expansion began. An inscription at Hisn Gorab dated A.D. 640 is said to record the final submission of the Hadramout to Islam. The first recorded Moslem maritime expedition was Moawiya's attack on Malta and Crete in 653 but it seems that Cyprus had been attacked previously. The first Moslem settlements in Africa were during the life of Muhamad when some of his relatives fled to Abyssinia from the Qoraishites; and although fugitives from Islam landed on the African coast, the first Moslem colonies date from c. A.D. 740 when Omayyad fugitives from Mesopotamia, etc., built settlements at Mogadiscio, Kilwa (Quiloa) and Melindi (Brava). These were destroyed with all the early records by the Portuguese. Chinese coins dated 713 have been found on the coast but very little attention has been turned to the numismatic evidence, more especially in respect to sites, stratification, etc., with the result that there are great gaps in the history. Most of our knowledge of East Africa has been obtained from the works of Masoudi⁽⁵⁰⁾ and Ibn Batouta⁽⁵¹⁾, who travelled on the coast in the tenth and fourteenth centuries of our era, supplemented by the geographical works of Ibn Khordadbeh, Ibn Hauql, Abulfeda, etc. There is a special bibliography on the subject. Thanks to the kindness of Colonel Heythrop (Secretary of the Royal Asiatic Society) I have been able to trace and read most of the important works. As a general rule the English publications are abridged and students are recommended to consult the French-Arabic or French translations published by or reviewed in the *Journ. Soc. Asiatique*, Paris. The following is a summary:—

Trade (Ibn Khordadbeh, died 912)⁽⁵²⁾.—"Most of the trade in the hands of Jews who travelled by land and sea." They brought back slaves, silk and swords to Farama (near Pelusium). Farama in ruins c. 1300 (A.E.R.) Aden; great market in succession to Adulis.

Zeila (Ibn Sayd, died c. 1286)⁽⁵³⁾.—Three days' sail from Aden. Mostly a Moslem population, about the size of Aidab (Red Sea pilgrim town). It belonged to Abyssinia but was ruled by local sheikhs. (Ibn Batuta landed at Zeila in 1330.) Great fishing centre. Considered by Devic to be the Avalites of the Periplus.

Berbera (Ibn Batuta).—A filthy town caused by the blood of the camels slaughtered daily in the streets and quantities of fish landed. (Al Idrisi, c. 1153)⁽⁵⁴⁾: Before Socotra come Khartan and Martan where the people speak the ancient Adite language. They are dependent on Chihr (Schihr) the incense country (South Arabia). (Ibn Sayd): Marka, east of Karfuni, was the capital of Havya (i.e. the Hawash region, A.E.R.) and was tributary to Mogadiscio. Karfouna and Terna were Berbera towns. Seaport Hafoun or Hafuni. Mentions Jebel Hafun. Caravans went from Merka to Zagawa and



The World according to Al Bateny (from Renaud's Abdufeda).

Kanem. Possibly the Nedjaa Markatha of Abulfeda (A.E.R.). Merka was west of Jebel Hafun (*vide* Devic). (Ibn al Wardi, died 1289)⁽⁵⁵⁾ described Zendj as from Berbera to Sofala.

Socotra, see Cosmas (*op. cit.*).—Hasan Hamdani⁽⁵⁶⁾ (cited by Devic) states population descendants from ten thousand Christians exiled by Khosroes mixed with people of the Mahra tribes.

Mogadiscio.—The river (now silted up) was considered to be one of the Nile branches by Ibn Sayd. The population of the town was Moslem. Ibn Batuta arrived there in 1331 after a fifteen-day voyage from Berbera. The mosque was built in 636 A.H. (A.D. 1238), but this was not the original building. The ruler was Sultan Abu Bekr ibn Omar of Berbera who was most hospitable. The people of *Socotra* were reported to be Nestorian Christians who exported myrrh. Note (A.E.R.): In 834 the Caliph Al Motassim had expelled the Zott (Indian gipsies from the Indus) from the Euphrates marshes where they had been joined by escaped slaves and practiced piracy. The Zott seized Socotra and made Makram their headquarters. They preyed on the shipping in the Persian Gulf, Red Sea and on the African coast. Dahlak

was raided several times by them and it is believed they participated in the great revolts of the black slaves (883-898) in Mesopotamia and the Carmathian raids and destruction of many cities in Southern Arabia. Mogadiscio was a place of refuge during that period and Melindi was colonized by people from Mogadiscio.



The Galla.—Ibn Sayd describes the country of Karla as extending (inland) from the Zendj coast to Abyssinia, south of which is Lake Tsana. One of the towns was Djenbyte and he states that the Karla occupied then a special position in Abyssinia. He also mentions a Lake Koura as the source of the great Niles, viz. the River of Egypt, the River of Mogadiscio and the River of Ghana (i.e. the Niger). It is doubtful if the Congo river was known to the Arabs even by hearsay at that period. Lake Koura is possibly Lake Victoria

al Wardi described the natives as idolaters who had no written code but who were harangued by katebs, which reminds us of the Druidical traditions. They had special chained men to lead in their armies as forlorn hopes called "Al Mokazzamoun" as the chains were fastened to the nostrils. Mogadiscio (*vide* Yacut) was inhabited by pure Arabs (c. 1229) and merchants came there to buy sandalwood, ebony, amber (ambergris) and ivory. Poisoned arrows



were used. It was rebuilt (c. A.D. 903) by the Chiefs Sayd and Suliman who had fled from Oman.

Mombasa.—Ibn Batuta described the mosques as constructed of wood. Ibn Sayd says it was the capital of the Zendj kings and Al Idrisi (from hearsay) stated that the people hunted the leopard and lion with red dogs and exploited the iron mines. Bananas grew there.

Lamu.—Possibly the Pyralaon of the Periplus (*vide* Devic). Abul Muhasin (fifteenth century) states the town was twenty marches from Mogadiscio and that bananas were found there.

Melindi (or Brava or Beroua).—Ibn Sayd says was situated on a great gulf into which the river from Cape Comor (Comoro islands) descended. Al Idrisi (from hearsay) wrote that the natives worshipped stones coated with fish oil and worked the iron mines. Ibn Batuta alluded to cannibals in the district. This cannibalism seems to me to have been the result of over-cultivation, drought and improvidence as it occurred much later among a section of the Zulus in Natal.

Sofala.—Masoudi wrote that Sofala meant shoal. Bruce identified this country with the Land of Ophir (of Solomon)⁽³⁸⁾. Ibn Sayd said the people were Moslems and mined gold and iron. The natives were clothed in leopard skins and the towns were Batina and Seyouna (Sena, on the Zambesi) the capital. He described the Straits of Madagascar as two and half degrees wide and two degrees long, between Bagati and the island. Ibn Al Wardi (died 1349) described the export of gold and iron from Sofala to India as the natives preferred brass and glass beads. Ivory was taken to Oman and transhipped there to India and China. It is notable that the hide of the elephant was then used for shields as it was by the contemporary Begas of the Sudan.

Madagascar.—Masoudi stated that the population had been conquered by Moslem fugitives (Abbassides) and that their descendants spoke Zendj.

The foregoing is merely a very brief summary and only mentions the principal facts in the works cited. Marco Polo visited Madagascar in 1288 and described the people as Saracens (i.e. on the coast). The Catalan map published about 1375 is one of the earliest European charts known. Sir Harry Johnston estimated the accession of Kimera, the first king of Uganda as about A.D. 1400 and at this point I shall now close this part of the paper. The subsequent history is much too detailed and long to be compressed into the few pages at my disposal, and would be best summarized in the form of a chronology at present.

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- (¹) See the Introduction to Renaud's edition of Abulfeda, Paris, 1848.
- (²) "Palæolithic Man and the Nile Valley in Nubia and Upper Egypt," 1933.
- (³) "George Grenfell and the Congo," vol. I, p. 109, etc., also p. 500, etc.
- (⁴) "Man," November, 1932, vol. XXXII, No. 298.
- (⁵) Inscription of Sennacherib (H. Frankfort, *Illust. Lond. News*, 25th August, 1934); also C. E. P. Brooks: "From the Ice Age to the Iron Age" (*Discovery*, March, 1925, p. 474, etc.), and "African Lake Levels" (*Discovery*, p. 104, 1925, etc.).
- (⁶) Gordon Childe, p. 98: "The Most Ancient East." Stone hammers were used by the slaves in the North African mines when they were worked by the Romans.
- (⁷) Sir John Evans, p. 365: "Ancient Stone Implements," London, 1897, Beads; see Johnston (copper dross at Katanga); *Jnl. Roy. Instit.* (Tanganyika), vol. XII, 1883, p. 8; and West African, p. 64; also Dechelette: "Le Manuel d'Archæologie," vol. II, pp. 345-372, etc.
- (⁸) Minoan I and Susa I are c. 5000 B.C. and 4600 B.C. respectively. Fleure gives the date of the great Mesopotamian Flood as c. 4600 B.C. Brunton gives the Badarian (Egypt) era as c. 5000, the culture of which was neolithic. Professor Breasted fixed the era of the first Egyptian dynasty at 3400 B.C., and I have adopted his chronology.
- (⁹) See Father Bosch (*Anthropos*, January-April, 1929, vol. XXIV, Nos. 1 and 2); and Dr. Gsell: "Histoire ancienne de l'Afrique du Nord," 8 vols., vol. 1, 208. I have found "Notes and Queries on Anthropology" published by the Royal Anthropological Institute, and the British Museum handbook "What to look for in Archaeology," most useful.
- (¹⁰) "The Peoples of Egypt" in *Ancient Egypt*, part 3, 1931.
- (¹¹) "Travels to Discover the Sources of the Nile," first edition.
- (¹²) T. Bent: "The Ruined Cities of Mashonaland," pp. 178-79 and 184, and numerous articles in the *Mining Magazine*, 26th January, 1926, etc. See also J. P. Johnston: "The Prehistoric period in South Africa," p. 81, etc.; and Theal's various publications on African history and ethnology prior to 1505.
- (¹³) Recent explorations in north-eastern Sinai show that King Solomon mined copper there.
- (¹⁴) The site of Saba or Sheba as identical with Azab (Africa) is inconsistent with the Mesopotamian records which are not cited by Kammerer ("Essai sur l'histoire antique de l'Abyssinie," p. 15). Saba is a common place-name and was probably situated in Idumea or may actually have been Petra before the southern site near Sanaa was adopted. See Conti Rossini's articles in the *Journ. Asiatique* (July-September, 1931), etc., for records of warlike expeditions from Arabia to Africa and *vice versa* prior to the Christian era.
- (¹⁵) Delaporte: "Mesopotamia," p. 254. The Introduction deals with the vexed question of the antiquity of civilization in Arabia.
- (¹⁶) "Cambridge Ancient History," vol. III, p. 62, etc.
- (¹⁷) "Arabia Felix," p. 67, and the Appendix (illustrated).
- (¹⁸) Et Tabari died in A.D. 922 at Baghdad. The French translation by Zotenberg is the one I have used. There is another by de Goeje in thirteen volumes (1870-1896).
- (¹⁹) R. Tungel, in *Illust. Lond. News*, 7th October, 1933.
- (²⁰) "The Azanian Civilization of Kenya" (*Antiquity*, June, 1933, pp. 153-165).
- (²¹) Book II, 30. They are the Sembrtæ of Strabo. M. de Salviac claims that

the Gallas are the descendants of Gaulish settlers who landed in Africa and that they are akin to the European Gauls. The claim seems to me to bear some resemblance to those of the converts and teachers of Islam and the political pretensions put forward by the French in Kassala in 1869.

(²²) *Herodotus*, book IV, 48.

(²³) Kammerer (*op. cit.*), plates XII to XVII and p. 59, etc.

(²⁴) "The Empty Quarter," p. 141, etc.

(²⁵) *Nouv. Journ. Asiatique*, Tome III, Paris, 1829, p. 409, etc. See also Admiral M. Guillain: "Documents sur l'histoire de l'Afrique."

(²⁶) "Ancient Times," p. 187.

(²⁷) Dr. Reisner (*Sudan Notes and Records*, vol. V, p. 187), and Wallis-Budge (*Anglo-Egyptian Sudan*, vol. 11, pp. 94-5).

(²⁸) *Geographical Journal*, May, 1911, pp. 523, *et seq.* The monument of Ptolemy Philadelphus at Adulis described by Cosmas described his Asiatic campaigns.

(²⁹) A. Hodson: "Where Lions Reign," p. 140. Kammerer (*op. cit.*), plate XLIV for illustrations. See Max Gruhl ("Citadel of Ethiopia") for history and illustrations of ancient Kaffa.

(³⁰) The effects of continuous cultivation on sites which are entirely dependent on rainfall are frequently overlooked by archaeologists. A considerable portion of the earth's surface has been turned into desert by abandoned cultivation after natural or artificial irrigation (see Aurel Stein: "On Central-Asian Tracks," p. 27, *et seq.*). Sir H. Johnston (*op. cit.*, p. 207) wrote: "The negro left to his own elementary ideas of agriculture was rapidly turning his continent into a desert." See also my paper "Nomadism in the Nile Valley" in *Sudan Notes and Records*, part 1, 1935.

(³¹) Strabo: Book XVII, 4, 22, etc.; and Pliny, N. H.: Book VI, 181, etc.

(³²) Marcus (*op. cit.*) states that in c. 69 B.C. a negro (Kaffir) race from Madagascar landed on the mainland near the Quilimane river and moved north. They invaded Abyssinia from the south-west and forced the descendants of the Automoli into Upper Nubia. As the camel is bred for food by the savage tribes on the shores of Lake Rudolph my paper "The Camel in Antiquity" in the *Journal of the Royal African Society* may be of interest.

(³³) Asher's edition of "The Itinerary of Benjamin of Tudela."

(³⁴) C. B. de la Ronciere, p. 102: "La decouverte de l'Afrique au moyen age," Cairo, 1924-25.

(³⁵) Strabo (*ante*) and Sprenger (*Jnl. Roy. Asiatic Soc.*, N.S. VI, 1873).

(³⁶) Milne: "Egypt under Roman Rule," p. 34.

(³⁷) *Revue d'Archæologie*, 1882.

(³⁸) H. Becker: "Die Kanzel im Kultur des alten Islam," Giessen, 1908.

(³⁹) Ptolemy: Book 1, 9, 3-4.

(⁴⁰) My "False and Imitation Roman Coins" (*Jnl. Antiq. Assoc. of the Brit. Isles*, December, 1931, *et seq.*).

(⁴¹) Mullers's edition or Didot's translation, Paris, 1901.

(⁴²) D'Herbelot: *Bibliog. Orient*, p. 704.

(⁴³) Eusebius: "Vita Constantius." I have used Loeb's editions of the classics as far as possible.

(⁴⁴) Philostorgius: Book 3, Caps. 4-6.

(⁴⁵) Cosmas: "Top. Crist." Paris, 1907, with maps. There is an English edition by the Hakluyt Society.

(⁴⁶) "Historia Aethiopia," London, 1684, Cap. 11, 4.

(⁴⁷) Procopius: Book 1, 19-20. Gibbon: "Decline and Fall," 1844 edition

gives a good description of the interview and cites most of the early Christian historians.

(⁴⁸) See *The Koran* (Sura CV, The Elephant, in Rodwill's version, Dent).

(⁴⁹) M. J. de Goeje: "Les migrations des Tsiganes," and Tabari (*op. cit.*).

(⁵⁰) Abul Hasan ibn Husein Masudi ("Les Prairies d'or"), translation by Barb. de Meynard and P. de Courteille, 9 vols., Paris, 1861-1873).

(⁵¹) Muhd. ibn Abdallah ibn Batuta ("Voyages d'Ibn Batuta," translation by Defremery and Sanguinetti, 2 vols., 1853-9).

(⁵²) Abul Qassin Obeidallah ibn Ahmed ("Le livre des routes et des provinces"), translation by Barb. de Meynard (*Journ. Soc. Asiatique*, 1865).

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(⁵⁴) Abdallah Muhd Abdallah ibn Idris ("Geographus Nubiensis"), translation by A. Jaubert (with maps).

(⁵⁵) Zein ed Din Omar el Wardi. Fragment translation by Tornsborg, Upsala. See also d'Herbelot: *Bibliog. Orient.*

(⁵⁶) Hasan Hamdani, translation by H. H. Muller, Leyden, 1884. See also *Proc. Roy. Hist. Soc.*, vol. I, 1883.

(⁵⁷) See Goeje (*op. cit.*). Renaud: "Voyages des Arabes et Persanes," 2 vols. Mookerji: "History of Indian Shipping." Devic: "Le Pays des Zendjs," Paris, 1883, gives extracts from classical and Moslem writers. Burton: "Book of the Sword" deals with weapons but is inclined to stress the Egyptian cultural influences in East Africa as Livingstone also did.

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The Meteoric Iron at Mbosi

By Frank Oates

THE following notes relate principally to the Mbosi meteorite, the sole representative of these strange visitants from outer space that is known beyond doubt to have fallen in Tanganyika. This great mass of nickel-iron unconnected with any rock formation and partly buried in rock detritus and soil offers concrete evidence of its celestial origin. The fiery descent of other meteorites may indeed have been witnessed hitherto by observers within the Territory and some of these doubtless attained their objective without complete disintegration but if so they have not as yet been unearthed.

Stony meteorites have been recorded from Duruma in British East Africa and from Bur Gheluai in Italian Somaliland⁽¹⁾, but so far as the writer is aware the Mbosi occurrence is the only authenticated meteoric iron of which East Africa can boast.

In framing a descriptive article such as this, intended for the general reader and yet of necessity interlarded with indigestible scraps of scientific "jargon," one is confronted with the alternatives of wearying the reader by preliminary generalizations or exhausting his patience by parenthetical explanations. Unfortunately one or the other appears to be inevitable if the subject is to be made readily comprehensible, so that with this apology the former plan will be here adopted and indulgence craved for the preliminary remarks that follow.

As most of us are aware, the fall of meteorites from the sky is usually preceded by startling phenomena of light and sound, which have suggested the application of the somewhat misleading term "thunderbolts" to these cosmic fragments. The popular belief that their fall takes place only during storms may be dispelled. It is clear, notwithstanding, that these wandering bodies are travelling through space with planetary velocity so that when they impinge upon the earth's atmosphere the results are liable to be sensational. The accompanying violent manifestations of light and sound are due to the resistance of the air to a heavy body moving at enormous speed. The air-friction causes it to become white-hot at the surface and consequently luminous, but its velocity is retarded to such an extent that during the last part of its flight it probably falls under the influence of gravitational force alone. This assumption is borne out by examination of the crater made by a meteorite when discovered (as all too rarely happens) shortly after its observed fall.

The vast majority of meteorites entering the sphere of the earth's attraction are disintegrated and dissolved in vapour while still in flight. The greater proportion of those that persist must fall into the oceans, and the relatively small number that reach *terra firma* are usually of moderate size. Catastrophic

visitations such as that in 1908 near Vanovara in Siberia, where blasts of air were set up devastating the forests over an enormous area while the shock of impact of the meteorite caused seismic waves recordable thousands of miles distant, are fortunately all but unique within the memory of man⁽²⁾.

Broadly, meteorites are of two kinds: meteoric irons consisting of an alloy of iron and nickel, and stony meteorites consisting principally of silicates of magnesium and iron belonging to the pyroxene and olivine mineral groups such as characterize terrestrial basaltic igneous rocks. There is no hard and fast division between the two extremes but a somewhat arbitrary grouping has been effected according to the proportion of nickel-iron to stony material. Thus, *siderites* consist almost entirely of nickel-iron alloy; while *siderolites*, *chondrites* and *achondrites* contain the alloy in large, moderate and very small amounts respectively.

Contrary to what might be anticipated, no new elements have been discovered in meteorites, but some contain minerals such as the sulphide of calcium, *oldhamite*, which are unknown terrestrially on account of their instability in presence of air and moisture. According to Prior⁽¹⁾ the elements of which meteorites are mainly composed are those of low atomic weight such as occur commonly in the earth's crust, namely aluminium, calcium, carbon, iron, magnesium, nickel, oxygen, phosphorus, silicon and sulphur. In small amount occur chlorine, chromium, cobalt, copper, manganese, nitrogen, platinum metals, potassium, sodium and titanium. Traces of argon, helium and radium, and doubtfully gold, tin and vanadium have been recorded. Meteoric stones have the characters of igneous rather than of sedimentary rocks, but, as regards their average chemical composition compared with terrestrial igneous rocks, they are poorer in silica, alumina and lime, and much richer in magnesia, ferrous oxide and sulphur, besides containing nickel-iron alloy, which last is but rarely found in the earth's crust.*

One of the characteristics of meteorites is the thin black crust of fused material contrasting sharply with what is beneath, be it stony or metallic. This, as already remarked, is the result of localized superficial heating on account of air-friction. In the case of iron meteorites this superficial film consists of magnetic oxide of iron.

The meteoric irons or *siderites*, being naturally occurring metallic alloys, resemble artificially prepared alloys in that they display internal structures when highly polished plane surfaces are prepared and etched by a suitable chemical reagent—usually a dilute alcoholic solution of nitric acid. Metallography, which is a branch of the applied science of metallurgy, is in fact the study and classification of artificial alloys on the basis of their constitution revealed by similar means. The principle is of enormous importance in the steel industry since the use to which any particular steel alloy may be put is determined by its eutectic constitution and crystalline structure. The

* A remarkable occurrence of native iron in masses up to twenty tons in weight, weathered out like boulders from parent basalt, is at Ovifak, Disco Island, Greenland. This closely resembles meteoric iron and even gives the characteristic etch-figures referred to later.

etch-figures produced on the polished surfaces of meteoric irons are known as "Widmanstätten Figures" after their discoverer. The crystalline structures brought out by these means are of several types but the commonest is that in which bands of an essentially nickel-iron alloy containing about six per cent of metallic nickel (*kamacite*) are arranged parallel to the faces of an octahedron and bordered by bright narrow seams of another alloy containing up to forty per cent of nickel (*tanite*), while the interspaces are filled with a third material (*plessite*), which is most probably an intimate mixture of the first two alloys. Meteoric irons showing such etch-figures are termed *octahedrites*, and there are further subdivisions according to the degree of coarseness of the texture. A similar type of structure is encountered in certain industrial alloys though of very much finer grain than that in meteoric irons of the *octahedrite* class. A probable explanation is that the latter have become detached from infinitely larger masses, which by reason of their size have cooled slowly and thus provided conditions favourable to the growth of large crystals. The type of structure displayed in meteoric irons depends largely on the nickel-iron ratio. *Octahedrites* contain from seven to fifteen per cent of nickel. When the percentage of nickel is outside these limits somewhat simpler structures are the rule. A detailed description of the classification of the various types of meteorites would be beyond the scope of this paper; that at Mbosi belongs to the *siderite* group of the medium *octahedrite* class, the significance of which nomenclature should now be sufficiently clear.

The study of meteorites is a fascinating one and requires a considerable amount of specialized knowledge, those most competent to pursue it being mineralogists, geochemists or metallographers. It goes without saying that authenticated discoveries of meteorites never fail to awaken universal interest in the mineralogical world, while each occurrence is made the subject of detailed study. The British Museum (Natural History) has specimens representative of over six hundred and eighty falls, while Prior gives two hundred and fifty for the number of meteoric irons known⁽¹⁾.

Tanganyika's meteoric iron is situated at an elevation of approximately five thousand five hundred feet above sea-level on the western slope of Marengi Hill, one hundred and fifty yards or so from the summit and close to the boundary of the farm belonging to Mr. Jenness. Its position is given by Lat. 9°6'35"S. and Long. 33°2'15"E.* It is ten miles south-east of the Mbosi mission station in Rungwe district and about forty miles west of the township of Mbeya.

The mass was discovered in October, 1930, by Mr. W. H. Nott, a land surveyor of Johannesburg, who was erecting a triangulation beacon near by. Apparently his native assistant, on being ordered to go near the spot, refused to do so offering the excuse that there was a supernatural stone there which he feared to approach. Mr. Nott thereupon made a search himself and found the meteorite, which was partly buried in loamy quartz-rubble covered by a

* Position given by discoverer⁽²⁾.

few inches of soil. The discoverer, probably imagining the material to be of terrestrial origin, lost no time in pegging the area as a base metal claim, and the occurrence was thus speedily brought to the notice of the Mines Department and, a little later, to that of the Geological Survey. On ascertaining the true nature of his find, the discoverer seems in all seriousness to have considered its removal *in toto* for sale as a museum specimen, but its fate was quickly decided by the decision of the Tanganyika Government to disallow the claim application and to preserve the meteorite under the Ordinance for the Preservation of Objects of Archaeological Interest—the most suitable existing ordinance to meet the case!

It would seem that the first conceptions entertained regarding the size and weight of the mass were somewhat extravagant for a short notice inserted in *The Times* of 17th February, 1931, gives the first and revised estimates of weight as seventy and eighty-four tons respectively (whether short, long or metric tons is not stated*). The dimensions given by the discoverer were thirteen and a half feet by four feet by four feet⁽³⁾ and it may be remarked that even if these dimensions be accepted and the shape assumed to be that of a parallelepiped, which must enclose the maximum possible volume for those dimensions, it is impossible for the mass to weigh more than about fifty short tons, that is unless (to make provision for an extremely remote contingency) it is really dumb-bell shaped with a large knob completely buried. In making this simple calculation the determined specific gravity of a sawed-off fragment, 7.5 (water equals 1), was used. From the first notices appearing in the press it seemed that pride of place as the world's largest meteoric iron was to be wrested from the Hoba occurrence, near Grootfontein in South-West Africa, which weighs about sixty-six short tons⁽⁴⁾.

The occurrence at Mbosi was visited in December, 1930, by Dr. D. R. Grantham of the Geological Survey, whose carefully computed and conservative estimate of the weight as twelve to fifteen tons⁽⁵⁾ enables it still to be retained among the half dozen largest meteoric irons known. At the time of his visit the meteorite lay exposed for some two feet above the surface of the ground and was buried two or three feet deep. Beneath it was about a foot of quartz-rubble overlying decayed gneiss. It had been partly excavated by the original finder, who in the paper by Dr. Stanley⁽³⁾ is quoted as stating that about one foot was exposed above the surface when he came upon it. There were no signs of a crater, nor of the impact of a falling body, nor of any local charring, so that it may safely be inferred that the fall was not of recent date and that the mass arrived in its present position from the original and unknown point of impact by hill-creep.

Scattered through the rubble several feet from the mass were scraps of black magnetic oxide of iron up to one inch square and a quarter of an inch thick. These were afterwards found to contain nickel and are therefore without doubt fragments of scale detached from the meteorite during its travel downhill. As far as could be seen from the degree of exposure at the time,

* Short, long and metric tons contain 2,000, 2,240 and 2,205 pounds avoirdupois respectively.

the iron is roughly wedge-shaped, about ten feet long by three feet wide by four feet deep. These dimensions are maxima and may be compared with those given by Mr. Nott. It is lying on one of the triangular sides of the wedge and pointing nearly south-west.

In addition to the saw-cuts and chisel-marks made by Europeans in attempts to secure specimens, the mass displays a few ancient tool-marks. The local natives when questioned denied any knowledge of the occurrence but their asseverations were not convincing. Dr. Grantham has reason to believe that they practised certain rites in connection with it but the precise nature of these could not be ascertained within the brief space of his visit.

A specimen weighing four hundred and thirty grammes was secured by Dr. Grantham, the cut surface measuring about five square inches. This was afterwards polished and etched in the laboratory of the Department of Mineralogy of the British Museum (Natural History), South Kensington, London, and is now to be viewed among the collection of meteorites in the mineral gallery of that institution. Some idea of the hardness of the nickel-iron is evidenced by the fact that the removal of the specimen by means of a hacksaw (working in relays) took ten hours! A sample of drillings for chemical analysis was also secured, the surface one-eighth of an inch of oxidized crust being rejected.

A second smaller specimen, handed over by the Mines Department to the Geological Survey, has also been polished and etched and is now in the geological museum at Dodoma. The preparation of the material as well as the photograph illustrating this article are the work of Mr. J. H. Harris of the Geological Survey.

Three independent chemical analyses of the material have been made: (i) by the writer in the geological laboratory at Dodoma, (ii) by Professor G. H. Stanley in the Metallurgical Department of the University of the Witwatersrand, Johannesburg, and (iii) by Mr. Max Hey in the Mineral Department of the British Museum (Natural History), London. The results, which agree very closely, are furnished below for comparison.

				(i)	(ii)	(iii)
				*per cent	*per cent	*per cent
Iron	...	...	...	90.45	90.51	90.65
Nickel	...	...	...	8.69	8.65	8.53
Cobalt	...	...	...	0.66	0.63	0.62
Copper	...	...	...	Tr.	Tr.	Tr.
Manganese	...	...	...	n.d.	n.d.	—
Sulphur...	...	...	...	0.01	0.019	—
Phosphorus	...	...	...	0.11	0.112	—
Chlorine	...	...	...	—	0.013	—
Carbon	...	...	...	—	0.18	—
Insoluble in acid	...	...	...	0.03	0.06	—
Chromium	...	...	...	n.d.	n.d.	—

*By difference. Tr.=Trace. n.d.=not detected. —=not determined.

A determination of the carbon made in the metallurgical laboratory of the Royal School of Mines, London, gave 0.073 per cent, which differs considerably



The Meteorite in situ at Mbosi



Photographs (twice natural size) of a portion of the meteorite ground down to a plane surface, brought to a high polish and etched so as to bring out the octahedral structure.

The upper photograph is a trifle foreshortened, this being necessary so as to obtain illumination showing the maximum contrast.

The lower photograph shows the effect of allowing the specimen to remain for some time in a damp atmosphere after polishing and etching. The cloudy patches are due to corrosion produced by the sweating out of lawrencite, the strongly deliquescent chloride of iron.

from the figure obtained by Professor Stanley. The difference of the figures for the portion insoluble in acid in (i) and (ii) is probably attributable to different methods of taking the samples and may have been caused by contamination in cracks or otherwise with surrounding siliceous material, e.g. fine sandy detritus from the rubble in which the mass was embedded.

With regard to the mineralogical constitution of the material, this has been described by Dr. L. J. Spencer⁽²⁾ and by Professor G. H. Stanley⁽³⁾. The natural weathered surface of the specimen in the British Museum shows very distinctly the octahedral structure of the iron. It is cavernous with octahedral surfaces on which there are lamellæ in three directions. The mass is also traversed by cracks parallel to the octahedral faces. The polished and etched surface (shown in the accompanying photograph) reveals the usual octahedral intergrowth of *kamacite* and *plessite*, the *tanite* being in very narrow bands scarcely visible to the naked eye.

Examination under a higher magnification proved the presence of traces of other constituents, e.g. the monosulphide of iron (*troilite*) and the carbide of iron and nickel (*cohenite*), but the phosphide of iron and nickel (*schreibersite*) is rare and difficult to identify with certainty. The unstable chloride of iron (*lawrencite*) manifests its presence on the polished surface by the sweating out of yellow drops quickly developing to a brown stain. For a detailed discussion of these features and for metallographic micro-photographs illustrating them the reader is referred to the original papers (*op. cit.*).

It may appear that undue space has been devoted in the foregoing to the purely mineralogical consideration of the subject. In extenuation be it remarked that this is due to complete lack of information regarding the history of the Mbosi meteorite prior to its discovery by a European. It is hoped that the recapitulation of the known facts may serve to awaken interest in what must be considered a remarkable occurrence and cause further research to be conducted regarding its past history in relation to the local native inhabitants.

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Native Materia Medica

By W. D. Raymond

II.—THE MEDICAMENTS.

“ When I lie within my bed,
Sick in heart and sick in head
And with doubts discomforted
Sweet Spirit, comfort me.”—HERRICK.

“TAKE an ounce of plantain, with an ounce of betony stamped together; and drink it with warm water before the cold comes out, and it will destroy quotidian fever.” So runs a fifteenth century recipe for the cure of fever⁽¹⁾. It represents fairly well what the family leech of the middle ages could do for the cure of malaria, then common in some parts of England. Yet according to tradition the Indians of Peru were acquainted with the curative properties of cinchona bark in 1500, the story being that an Indian was cured of an ague through drinking water in which some of these trees had fallen during an earthquake. A Jesuit appears to have been cured of fever by the bark in about 1600 but it remained for the famous beauty, the Countess of Chinchon, to provide both the botanical name and the advertisement needed to introduce the remedy to Spain and Europe. In 1820 quinine was isolated from the bark and at the beginning of this century the chemical constitution of the alkaloid was fairly well understood. Although organic chemists of several countries have since made painstaking efforts to synthesize cheaper and more effective remedies quinine still remains the drug most used in the treatment of malaria.

Inspired by such a history it is with some degree of expectation that we approach the study of our own native drugs. But if fortified by further reading from our own early leechbooks our disappointment would not be so intense.

The diseases recognized by the African doctor⁽²⁾ appear to be relatively few but the drugs used in their treatment are legion. They are applied externally or internally, but we learn with surprise that a form of injection is also employed. Two general methods of drug treatment may be distinguished: firstly, the application of simple herbal remedies and, secondly, treatment by powders having supposed magical properties. The two methods cannot be clearly separated and often the practitioner will add to his mixture of drugs the additional touch of magic to nullify any witchcraft which perchance may afflict his patient. According to studies made by Koritschoner this added charm is called the *chingira*. He describes⁽³⁾ the ingredients and meaning of one such *chingira* as follows:—

A piece of the feather of an owl indicating the origin of the misfortune.

A piece of the flesh of a witch added for the same reason.

A piece of the flesh of a puppy killed before its eyes were open, signifying that the witch failed to see the right person and thus her charms will be powerless.

A piece of a wrinkle from the forehead of a lion supposed to give power to the patient.

Some soil from a termite hill from which a rainbow had been seen to rise probably signifying restoration to health.

A splinter from a tree growing near a grave, the significance of this being unknown.

This particular *chingira* was used in the treatment of a man sick with high fever and severe pain. A small portion was added to a medicinal mixture containing the roots of four plants.

This underlying tendency to attribute illness to witchcraft must be appreciated if we wish to understand some of the strange mixtures that are sometimes employed. What appeared to be rats' tails carefully bound in grass and leaves is one cure for toothache that would not appeal to modern dental science. The instructions for use were that the whole should be burnt and the ashes mixed with oil and applied to the aching tooth. However, apart from this magic craft the African has undoubtedly acquired through the generations a considerable knowledge concerning his flora as we have already seen in considering his arrow poisons. This knowledge he applies in the treatment of disease. Unfortunately, he is by no means always sure which of his several ingredients is the one effecting the cure. He is also at a disadvantage with his methods of diagnosis since he may mistake an abatement of the active signs of a disease for a real cure. That he claims to have drugs more efficacious than those known to Europeans is certain. Apparently hopeless cases, discharged as such by European doctors, are known to have been cured by the African *mganga*.

The reputation of some of these drugs extends over several continents; and peoples and tribes of diverse characters use identical remedies in the treatment of the same disease. Whether their reputation has spread slowly from tribe to tribe or whether they have been discovered independently we have no means of deciding. Perhaps the plant *Pedaliium murex* L., highly esteemed by the Swahili under the name *mbirgiri* as a cure for gonococcal infection, illustrates this well. The same plant is so highly valued by the natives of southern India as a cure for the same disease that it has held a secondary place in the Indian pharmacopœia and from time to time qualified medical men have testified to its healing powers⁽⁴⁾. Apparently in 1908 an attempt was made by the Maddahid Company of Dar es Salaam to exploit the drug commercially. The matter attracted the attention of the senior medical officer at the Sewa Hadji hospital and arrangements were made to test it on one hundred and sixty-four patients. It will be of interest to quote from his report on the results obtained⁽⁵⁾ :—

“The medicament was prepared in the following manner :—

“(1) Leaves were soaked two to three minutes in cold water. A mucilaginous green odourless fluid was produced. It was given three times

a day. The cases were infections with profuse yellow discharge and generally acute anterior urethritis. The strictest diet was ordered. Generally the urine was darker and the healing time longer than without this medication.

"(2) The leaves were boiled for half an hour, when a dark brown liquid with a somewhat bitter taste was produced. This yielded no better results.

"(3) The roots of the plant were placed twelve hours in cold water and then boiled for one hour. The dark brown bitter-tasting decoction was ordered one glass three times a day. After fourteen days there was a thick secretion. The urine, however, remained cloudy with an acid reaction.

"These results show that *P. murex* is of no value in the treatment of gonorrhœa."

Other indigenous drugs for this disease are undoubtedly greatly prized by the African, and several reports concerning their use have been received.

Another class of remedies which do not appear to have received the attention they merit are the anthelmintics. As early as 1875 Pax, who wrote a section on medicinal plants in the first account of the Tanganyika flora, describes several remedies for worm-disease and gave his opinion that some deserved further study⁽⁶⁾. In 1909 Dr. Penschke, then in government service, tried a native remedy called *lodua* and found it to be superior in the treatment of tape-worm disease to European medicaments in the state that these reached him⁽⁷⁾. It appears that he was using a species of *Embelia*, a plant which has been proved by modern work to act as an anthelmintic.

The attention of Europeans has also been attracted to various species of *Cassia*, a native cure for blackwater fever (especially *C. abbreviata* Oliv., *C. fistula*, *C. beareana* Holmes). It appears to have some value in that it introduces a considerable quantity of fluid into the body and has a sedative action on the stomach, but it is doubtful whether it has any specific action⁽⁸⁾.

Dr. Lester, who spent a considerable time studying the medicinal lore at and around Kahama, arrived at the conclusion that there existed a valuable native drug in the treatment of snake bite⁽⁹⁾. Although he describes actual cases it is difficult to avoid the conclusion that it is the mechanical rather than the herbal factor of the treatment which is effective. Certainly the number of different plants described by Dr. Lester is large, an almost certain sign that the *mganga* does not recognize any single plant as a really active ingredient.

Several persons have drawn attention to local galactogogues and a recent report was made in this journal⁽¹⁰⁾. A very interesting suggestion is made that the active ingredient of the medicine may be related to the sex hormones. Whether further investigation will prove that this is so or that the mechanical part of the treatment produces the flow of milk will be of interest.

These rather unrelated and haphazard attempts on the part of Europeans to utilize local medicaments have met with scanty success. This is not surprising since a complete collection of the plants utilized by a single tribe may run into hundreds. It is impossible in the scope of a short article to deal with

the variety of material that is represented in such a collection but the following as used by the Ikisu will sufficiently reveal the range of the average native dispensary⁽¹¹⁾ :—

(1) *Rokobe* (*Sporobolus* nr. *indicus*) :

Roots chewed with tobacco, saliva swallowed, and cud applied to snake bite.

(2) *Muzale* (*Heeria insignis*) :

Roots dried, ground, mixed with local porridge and used for dysentery.
Dose two drachms.

(3) *Rihokohoko* (*Euphorbia* sp.) :

Root extracted and used as purgative. Dose up to one ounce. Larger doses will cause death.

(4) *Omubibi* (*Dalbergia stuhlmannii*) :

Extract of root used as emetic. Dose four ounces.

(5) *Engwe Esuhu* (*Capparis* sp.) :

Root powdered, mixed with water and applied to chest. Allowed to remain fifteen minutes only. Longer period causes vesication.

(6) *Ekingwera* (*Courbonia edulis*) :

Used in a similar manner to (5). When fresh the root after removal of rind is used as a pleasant sweet drink and is reported to cleanse the stomach.

(7) *Museka* (*Xymenia caffra*) :

A lotion from the leaves is used to wash out the eye after injury from a spitting snake. It is also used (with another plant) for the treatment of yaws.

(8) *Kiturasongo* (*Synadenium grantii*) :

Roots boiled for half an hour with water and extract used as ear drops.

(9) *Nyamgohe* (*Bidens hildrandtii*) :

Leaves ground when green and applied to carbuncles for twenty days until the skin is broken.

(10) *Ikisururia* (*Aloe* sp.) :

Roots of this plant plus male pawpaw, leaves of (11) and incense used for gonorrhœa. Dose two ounces three times a day.

(11) *Nyanyinyi* (*Pavetta crassipes*) : See (10).

(12) *Ikoko* (*Rauwolfia* nr. *inebrians*) :

Bark placed in cold water and patient given three ounces of extract for griping pains in the stomach.

(13) *Nyehurya* (*Crotalaria* sp.) :

Extract from roots used for the same purpose as (12).

(14) *Nyehuru* (*Vernonia* sp.) :

Roots of (14) to (18) ground and mixed together. Added to *pombe* in the treatment of gonorrhœa.

(15) *Mukarakara* (*Carissa edulis* var. *tormentosa*) : See (14).

(16) *Rirarejanzugu* (*Dolichos oliveri*) : See (14).

(17) *Rirundurundu* (*Ipomœa kituiensis*) : See (14).

(18) *Muhosi* (*Acacia campylacantha*) : See (14).

(19) *Nyaribara* (*Marua trichophylla*) :

Roots cut in small pieces and steeped in water for one hour. One ounce twice daily for marasmic babies.

(20) *Nyakururu* (*Turræa* sp.):

Roots cut and steeped in water for twenty minutes. Five ounces twice daily for griping pains in the stomach.

(21) *Munangara* (*Ficus natalensis*):

Roots used in conjunction with (1) for the same purpose.

(22) *Ekehereka* (*Psorospermum febrifugum*):

Roots ground to powder and applied to fresh wounds.

(23) *Kasembe* (*Borreria compacta*):

Applied externally to rashes. The leaves are ground and mixed with water.

(24) *Nyitongo* (*Celosia trigyna*):

Leaves infused for twelve hours and ten ounces of infusion taken for tape-worm.

Casual chemical examination of these drugs shows the presence therein of at least two hitherto unknown alkaloids and another little-known alkaloid of some interest. It would appear that it is primarily the collection of native medicines coupled with their chemical investigation that holds out the greatest promise for the discovery of new drugs. This may prove a gigantic task, but the first step, the botanical identification of native remedies, is one that should be undertaken before they are engulfed and lost in advancing civilization.

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Pole and Fuel Plantations and Windbreaks, Kwimba District

By C. J. W. Pitt-Schenkel

IN THE Kwimba district all afforestation work is carried out by the native authorities, with the advice and under the supervision of the Forest Department. The work falls into two distinct categories—(a) pole and fuel plantations, and (b) windbreaks. Much of this district, especially in the vicinity of the *Boma* at Ngudu, is now almost devoid of natural tree growth, the original vegetation having been destroyed as the population, both man and animal, increased. The country on the whole is relatively flat, and the soil is often so hard that it is impossible to cultivate it until the rather uncertain rains have fallen.

Experience has shown that the most satisfactory species is the "ironwood" (*Cassia siamea*), and the next most useful one is likely to be *Dalbengia sissoo*. The Persian Lilac (*Melia azedarach*) showed promise at first, but it appears to be easily killed by excessive surface moisture. *Albizzia lebbek* seems capable of survival against termites and drought but its rate of growth is rather slow. As a fuel, *Cassia* has a high calorific value; it also gives good building poles which are fairly resistant to termites if they are not barked.

Originally efforts were made to form plantations of *Cassia* near each large village; it was not possible to supervise the work properly, however, and the few patches which were at first successful were not really protected from the local goats. Near the *Boma*, the work was more carefully carried out, and some fairly good plantations may now be seen there.

The first large fuel plantation was started in November 1930 near the chief's old headquarters at Kakora, and another was started in 1931 near his new one at Ngudu. The method employed is known as "spot sowing," i.e. at each spot (six feet square), a circle about one foot in diameter is cultivated and about six seeds sown; failures are resown, and when the plants appear to be established the multiple seedlings are removed leaving only one per spot. By 1932 it was realized that this method, at any rate in this district, left something to be desired—cultivation was not deep enough nor extensive enough—and a new method, based on the native system of cultivating *mhogo* (cassava), was tried out under the direction of the agricultural assistant then stationed at Ngudu.

An area of about twelve acres, which had been under maize, was ridged as for *mhogo* but along the contour and with cross or tie ridges about ten yards

apart. Seed was sown along the tops of the ridges at intervals of six feet, giving an approximate spacing of six feet by six feet. By this method a greater depth of cultivated soil was obtained, the seedlings could not be swamped by a heavy storm, and yet the water was held up in the furrows by the cross ridges and could only seep away gradually over the course of a few days. The seedlings, although on the ridges, could thus obtain more soil moisture and for longer periods than if they had been merely spot sown, as in the 1931 plot.

In 1933 another plot was established on similar lines just opposite the 1931 plot. Here, maize was intersown along the ridges between the Cassia; this protected the young trees and helped to keep down weeding costs, the necessary weeding being done by the natives (actually pupils of the central school) who had sown the maize.

The next year plots of Cassia and Persian lilac were established also near Ngudu, but the ground was first cultivated by two-oxen ploughs before being ridged. At the sub-chief's headquarters at Mondo two similar plots were established, also by being ploughed first, but here the Persian lilac was not ridged before sowing—the ground was almost level. At another place, a third Persian lilac plot was only "spot sown." Three different methods were thus tried for this species but it is too soon yet to say which will be the most successful.

By late March 1934, the ridged Cassia plots had shown truly amazing growth. Plants were six to nine inches high only three months after sowing; in the 1933 plot (close to that of 1931) the plants had an average height of four to five feet and a very healthy appearance; in the 1932 plot the trees were already taller than those of 1931 (spot sown), some being up to fifteen feet and in flower. The trees in the 1931 plot, besides being smaller than those sown a year later, also had a less healthy appearance. There seems to be little doubt therefore that the best method of establishing Cassia in this district is by first thoroughly cultivating the soil, preferably by plough, and then to contour-ridge and cross-ridge it. Besides giving deeper cultivation, it is easier for the ridges to be made fairly straight on ploughed land. It is considered that the better results obtained more than justify the extra cost of ploughing and ridging. To reduce weeding costs, the intersowing of some such crop as maize, cotton or sorghum, should be encouraged in the first year, but only if the natives can be relied on not to remove the seedlings when weeding. On a windbreak at Mondo all the seedlings were hoed out when the natives were weeding around the cotton plants!

Exact figures cannot be given for the costs of formation but excluding ploughing overheads (headman, cost of ploughs, and cost of feeding oxen over the dry season), the actual ploughing, ridging and sowing cost about ten shillings per acre (wages were twenty cents a day). It should be possible to establish plantations, i.e. the costs of formation, of the resowing of failures and of weeding, for about thirty to forty shillings per acre (wages are now

forty cents a day). Once established the subsequent operations of pruning, if required, and thinnings should more than pay for themselves by the sale of the produce removed. It is thought that it will be possible to work the plantations as coppice on a rotation of ten to twelve years.

The windbreaks were established to check æolian erosion, to protect the crops (chiefly cotton and sorghum) and to hinder the rapid drying up of the grazing. They should also provide a supply of building poles and of fuel.

The first attempt consisted of sowing a single irregular belt some fourteen miles long from Ngudu to Bukwimba station. Part of it was ploughed and part was cultivated by hand, but no ridging was done; it was spot sown with *Cassia* at six feet by six feet to a width of forty-two feet. It proved impossible to patrol this long line, and much damage has been done by the browsing of goats. In parts, however, it has come on well, and these good patches are now being thinned. In the 1930-31 season a compact series of ten belts, each a mile long, thirty feet wide and two hundred and fifty yards apart was started at Nyasota. Half the cultivation was done by a "Ransome" disc plough drawn by a "Fordson" tractor, but this proved too expensive as two Europeans were required to operate them, and so the remainder was done by two-oxen ploughs. No ridging was carried out before sowing and much of the loose earth was washed away during the rains; nevertheless, by the end of 1933 parts of this series were completely stocked and the trees had reached an average height of fifteen feet. At the time, however, ploughing was not considered satisfactory because of the soil wash and because the oxen were not fit till about a month after the rains had broken (they were not stall fed then), and for the next two seasons all work was done by hand.

In 1931-32 the work was pushed ahead at a tremendous rate; the original belts were extended to a length of over five miles each and new series were started at Itundwa (ten belts each about four miles long) and at Lubuga (twenty belts of varying length but totalling twenty-three miles)—a total length of about one hundred and twelve miles or three hundred and twenty-seven acres. Poor rains were experienced this season and most of the work was a failure; cultivation was not deep enough and the roots frequently failed to penetrate the hard ground beneath. The cost was about five shillings per acre.

For the next season it was decided to adopt the method of contour ridging which had been tried out successfully the year before in the Ngudu fuel plot. There were to be seven ridges six feet apart with cross ridges every ten to twenty yards according to the slope, though where the belts ran down any considerable slope transverse ridges were to be made instead of longitudinal ones. Apart from a few washaways and the early cessation of the rains, which caused many seedlings to die before they could become established, the result was a success, but it did show that late sowings (i.e. after February) were not worth while. Altogether some sixty-eight miles (two hundred and ninety acres) were treated in this manner at an average cost of just over ten shillings per acre.

During the 1933-34 season the work of beating up (resowing of failures) and of continuing with the ridging of the original belts was started as soon as the rains broke, but a drought of two and a half months from Christmas onwards killed most of the seedlings which did manage to germinate. The established trees, however, put on good growth as a result of the little rain which did fall being held up by the ridges and cross ridges. In addition to this work, a new series of ten belts totalling some six miles was started at Mondo, but here they were ploughed first before being ridged.

During the last two seasons funds have been low and work has been confined to consolidating that of past years. On the black cotton soils (*mbugas*) Cassia has failed, and so far only potted *Eucalyptus microtheca* has been found to succeed, and this only as a bush rather than as a tree. At Nyasota, natural regeneration of Cassia is being encouraged by hoeing patches near the seed-bearing trees.

When ridging was first started on the windbreaks the soil was simply pulled up on to the ridges from either side, with the result that the roots of many seedlings had difficulty in penetrating the uncultivated ground beneath. In 1933 each labourer had to cultivate his *kipande* (seventy to one hundred yards) to a width of three feet, and only then was he allowed to build up the ridge with soil from the uncultivated strips between his ridge and those of his fellow-workers.

In the earlier years the whole of each belt was weeded, but in 1934 the policy was tried of weeding only a small area round the trees under four feet high, the grass on the rest of the belt being left to check æolian erosion and evaporation from the soil. This grass proved so luscious, however, that the natives, in spite of patrols, took their stock out at night and grazed them in the belts!

Canadian prairie experiments in windbreak planting show that a break is effective for a width to windward equal to one and a half times the height of the trees, and to leeward for four and a half times, thus protecting a strip of country equal to six times their height. These windbreaks cover only 4.8 per cent of the land, and it is realized that should the trees attain an effective height of even forty feet only about one-third of the country will be protected. Owing to the dense population (human and animal) it was felt, however, that more land could not be taken from the natives. Nevertheless, these belts will supply some much needed fuel and hut building material, and allow the crop residues and manure to be saved for returning to the land instead of being used as fuel.

Owing to the length of the belts (the early work had been pushed ahead too fast), to the numerous soil variations which are caused by the slightest changes in topography, to the difficulty of effective supervision and to the adverse climatic conditions, the belts in several parts are still poorly stocked; but it is hoped that in another year or two they will be stocked over the whole of their length.

These fuel and pole plantations and windbreaks will be of considerable benefit to the natives of the district and it is gratifying to see the interest which the native authorities are taking in them. It is to be hoped that in other parts of the Territory where the land is similarly denuded of trees, the native authorities will follow this excellent example of the Bukwimba Federation.

The writer wishes to acknowledge the help received from Mr. A. Burrows, Forester, Mwanza, for supplying notes which enabled him to bring the above description up to date.

Indonesian Echoes in Central Tanganyika

By A. T. and G. M. Culwick

INTRODUCTION.

THE HISTORY of the Indian Ocean and of the exploits of its adventurous voyagers as raiders, traders and migrants, centuries before European influence appeared on the scene, is a subject whose fascination grows with every fresh attempt to piece together its scattered fragments. The fragments relating to East Africa are gathered from a great variety of sources, ranging from ancient Chinese annals to technological evidence of the present day, but there are still many lacunæ in the story and many riddles awaiting solution.

Early Indonesian influence on the east coast of Africa is now generally recognized, and it is clear that the intercourse between Indonesian and African peoples both dates from very early times and was once on a considerable scale. J. Hornell in a recent most interesting paper⁽¹⁾ brings forward "presumptive evidence" to show that the "Hinduized Indonesians of Sumatra and Java" were engaged in trading slaves from Africa to eastern Asia at least as early as the eighth and ninth centuries *anno Domini*, and he cites FERRAND as giving linguistic reasons for inferring that Sumatrans first colonized Madagascar as far back as the second to fourth centuries of our era. He examines at some length the historical and cultural evidence bearing on the migrations to Madagascar (of which the latest is thought by Ferrand to have taken place in the tenth century) and on the extensive coastwise trade carried on by Indonesian navigators all round the Indian Ocean and up and down its western shore in particular.

"It will be seen," he writes, "that all the probabilities point to the voyages of Indonesians from Sumatra and Java to Madagascar as having been performed in stages via South India and the Arabian coast (Aden) in the earlier waves of migration, probably under the pilotage of Indian navigators. In later times a direct course may have been shaped to Madagascar from the Indian coast during the period of the north-east monsoon. As the Sumatran kingdom of Srivijaya maintained intimate relations from a very early date with the South Indian Pandyan and Cholan kingdoms, which were already highly civilized at the beginning of the Christian era, we may take it that the first stage was a direct run from Achin, at the northern end of Sumatra, across to South India or Ceylon, or possibly in some instances to the Maldivé Islands; thence, at the beginning of or towards the end of the south-west (*sic*) monsoon, direct to the Swahili coast or else across to the Arabian coast, where Aden would serve for refitting; and then by way of Mogadishu (Mogadoxo) and Kilwa, probably both used as Indonesian naval stations, to a final destination in the great island of Madagascar, known to the Arabs as Komr, a name still

surviving in that of the small island group north of Madagascar, the Comoro Islands, which would form a secondary and convenient halt on the way to and from Kilwa."

Later, according to an Arab, Ibn Said, writing between 1208 and 1286⁽²⁾, the immigrants in Madagascar split into independent groups as their numbers increased, and many eventually migrated again, this time to the African mainland where they penetrated inland.

It is with evidence of penetration inland by Indonesian influences, at one time or another, that we are specially concerned here; but not, let us hasten to add, with the lively controversy over the origin of bifid prows, peculiar seams and other features which characterise the Victoria Nyanza canoes. We would draw attention to an area where canoes are unknown and to people who, so far as we are aware, have no word for canoe in their tribal language. One would hardly select pastoral tribes of the Central province as likely people among whom to find echoes of Indonesia, yet a number of suggestive facts came to our notice when we were living in Singida a few years ago. Unfortunately we had no opportunity to follow them up, and we make them public now in the hope that other people may perhaps be able to do so. No one of them can stand by itself, but taken together they are undoubtedly striking and invite further investigation.

PHYSICAL CHARACTERISTICS.

The first point that struck us was the occurrence of olive or very light brown skins among the Wanyaturu, the Waniramba and the Wanisanzu, together with cases of cheek-bones and slanting eyes reminiscent of Asia, and a peculiar depressed sort of nose. We have still with us a Turu boy with one Isanzu wife and one Turu wife, and also an Iramba garden-boy, who between them display all these features. The two women, save for their hair, might very easily pass for olive-skinned Asiatics though neither is the product of recent miscegenation; and while as isolated specimens they would not, of course, deserve remark here, we mention them because such features, whether in conjunction in the same person or not, are by no means rare in that area.

TURU TRADITIONS REGARDING MIGRATION.

A very curious legend is recorded by von Sick who obtained it from an old man called Mbu'ha of Kahiru. It runs as follows:—

"A long long time ago our forefathers lived beyond the sea in a country wholly surrounded by water. Once there was a great famine there because the locusts ate up all the fruit on the trees, their only food. Consequently they decided to migrate. They felled trees and bound the logs together with bark. The women and children were set in the middle with provisions consisting of sweet water and fruit. The men rowed, two in front and two behind. Thus they travelled many days towards the setting sun till they came in sight of land and landed at the mouth of a great river. One half remained at first on the coast, the other followed the river upstream, living on game which existed

in great abundance. Eventually they left the upper reaches of the river on their right-hand and travelled through a dry country till they came to Kwilinga, where they settled. Later, those who had stayed on the coast followed in their wake. At first all went well in Kwilinga. Then came a famine, many of them died and the rest scattered. One of them, called Kahiru, went northwards with his son Singi till he came to the district now called Kahiru after him. At first he was driven out of it by the Mangati who would not suffer an invasion of their grazing-grounds. But he soon came back again with some more of his fellow tribesmen and settled down there permanently.”⁽³⁾

Von Sick's comment on this strange story is that, however improbable such a sea voyage may be, he feels it is worth recording “with all due reservations,” in view of the fact that “philologists think they have found Malayo-Polynesian influences in Bantu idioms.”

We can confirm the existence among sections of the Wanyaturu of a tradition that their forefathers came from the coast, and further of a belief handed down in some families that the Kilosa area was an intermediate home of their particular ancestors, some of whom remained behind there instead of moving on when the migration inland was resumed by others. Von Sick speaks of groups of Wanyaturu still living at Hika near Kwilinga and in Ugogo, and in the light of traditional history there is some reason for regarding these as stragglers left behind in the irregular course of certain migrating groups, whose general trend appears to have been in a north-westerly direction.

On the other hand, another old man quoted by von Sick (*op. cit.*), one Lue of Puma, speaks of “the Ngulu district (lying to the east of the southern part of the Masai steppe)” as an intermediate home of his ancestors who, he too asserts, came from the coast and whom he declares to have moved from Ngulu to Kwilinga, which is north of Saranda, on account of famine. It must, however, be taken into account that the Wanyaturu were not formerly a single political unit under a paramount chief but an agglomeration of groups, and while the coast and Kwilinga occur in several of their traditional histories, there is nothing to justify an assumption either that different groups left the one or reached the other at the same time or by the same route, or that all groups in the tribe came from the same direction. Indeed, there are many reasons for supposing that the affinities of a large, may be the larger, part of the tribe lie in a northerly direction. In speaking of migration in this context, we imply no single migrating unit, no definite plan, no large organization and no set goal; but the rather haphazard response of groups of individuals to pressure of circumstances, inducing some or all of them to move away in search of better conditions. We would not for one moment suggest that the whole Turu tribe as we know it to-day is of Indonesian origin or came from the coast. But in the agglomeration of groups now welded into that tribe, and also among their neighbours in Mkalama, there appear sporadically physical and cultural characteristics which, taken together, can only be regarded as strongly suggestive of the Indonesian influences which admittedly have been present on the coast.

One more point deserves notice under this heading. In the event of the legend of a sea voyage being founded in fact, the general direction of the migration, as indicated by tradition, at once suggests the Rufiji as the "great river," but von Sick's account speaks of leaving the river on the right hand. Now, apart from the fact that we cannot, of course, build too much on the details of such legends, it is worth considering von Sick's method of obtaining this material. He himself did not speak Kinyaturu but employed an intelligent askari, whose duty it was to make friends with old men met on safari and to get them talking without constraint, "not sparing the beer to loosen their tongues." This indirect recording, with an African intermediary, is of itself sufficient to account for confusion in such things as left and right, for if the old man waved his right hand in a southerly direction, it might very well be reported that they left the river on the right hand; whereas he may equally well have meant they left it to the south. This confusion is the more likely in that, as von Sick himself records on another page, left and right in Turu are described by the points of the compass, according to the way a man happens to be facing.

A MARINE FOOD TABOO.

A small Turu clan called Mánguamugúnga hands down from one generation to another a food taboo strangely out of keeping with the environment in which the clan now lives, namely the dugong=*nguwa* (both on the coast and in Turu). Our boy belongs to this clan and though he has, of course, been to the coast since he entered domestic service, he grew up as a typical cattle-herding young savage, he and his relatives knowing no more of the sea and its creatures than did his ancestors for generations past; and the sum total of that knowledge was the name and traditional description of their taboo, which was "a great big fish like a human being, one man could not carry it."

A MYTHICAL BLOWGUN.

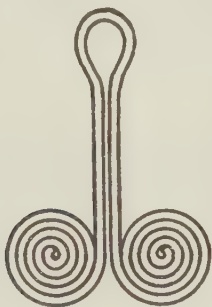
A curious tale circulates in Turu about certain expert cattle-thieves who make a tube five or six feet long out of a tree called *mfufu*, whose soft core is alleged to be easily bored with a hard pointed stick. Into this tube they put *dawa*, and then at night they approach unperceived to within a few yards of the sleeping owner of the cattle and blow the *dawa* towards him. His sleep at once becomes so exceptionally heavy that nothing can wake him—and in the morning there are no cattle.

The idea of putting intended victims to sleep by blowing a powder towards them is not, of course, by any means confined to Turu, or even to East Africa. It is the instrument alleged to be used in this case rather than the practice itself which calls for notice. Like many another myth, it is always a case of "I have heard from a friend who has a classificatory brother whose sister's son heard," etc, or "I heard people talking round a fire of someone who knew someone who," etc. No one has ever himself actually seen one of these legendary blowguns with his own eyes. But the belief in the existence of a

weapon so atypical in an African environment and so redolent of Indonesia adds one more striking and extremely suggestive anomaly to the series we are here considering.

DOUBLE SPIRAL WIRE ORNAMENT.

Among the women of Uniramba an interesting ear-ornament of spirally coiled wire (diagrammatically shown in the accompanying figure) is or used to be very popular, though we have been told the fashion is fast dying now and only some of the older women still cling to it. The distribution of this ornament has not been fully elucidated, but we give below what we have so far been able to discover with the help of Messrs. H. J. Braunholtz (British Museum), A. J. Arkell (Sudan) and E. C. Baker (Tanganyika), and Professor Balfour (Pitt-Rivers Museum, Oxford).



Our interest in the ornament was first aroused by its close resemblance to the ear-pendant which is, to quote the *British Museum Handbook to the Ethnographical Collections*, "especially characteristic" of the Batak of Sumatra. So we began to pursue this type of ornament and found ourselves led far afield both in time and space. Let us trace it first as an ear-pendant in East Africa. In 1929 Braunholtz saw and photographed a single case near Kisumu where a Luo man was wearing one in each ear. He remarks that it appeared to be a rarity there for not only did he see no more but Hobley's photographs of the Jaluo, taken about thirty years ago, do not show any; and he adds that he remembers being struck at the time with its resemblance to the Batak ear-drop.

E. C. Baker also came across it some years ago among the Jaluo, this time in North Mara, where he photographed both the simple form illustrated here and a more elaborate variant. The latter was worn by a pure Luo, the former by an Mgusero, a clan now known as Luo but actually, he points out, of Kuria origin. The Jaluo are Nilotes while the Bakuria are Bantu—a point whose importance will appear later. Baker adds further that the people themselves declare they obtained the design from the Masai, and with regard to the frequency of its occurrence in North Mara he thinks it was not uncommon among elderly men.

It must be realized, as Braunholtz points out, that in Abyssinia (Ghimirra) and among the Akikuyu there are brass wire ear-pendants with a single coil the other way round, and it is not a very big step from that to the double coil or even to reversing the spirals, all these being obvious ways to treat a piece of wire. Moreover, the Bakonjo of Ruwenzori use an open neck-ring whose ends are coiled outwards, while the Angoni of Nyasaland have a finger-ring of wire whose ends are also twisted into spirals standing out on either side of the

ring. The fact remains, however, that these are none of them just what we are discussing, viz. the double spiral ornament worn in the ear.

Looking outside East Africa, the same thing applies to a single spiral earring (in the British Museum) from Mussur, Siam, but we do meet our double spirals again as an ear-ornament in the south-eastern Naga Hills, among the Tukomi Sangtams and the Naked Rengmas, with the slight variation that among these people the top of the ornament is bent over so that the whole looks not unlike a large European dress-hook (examples in the Pitt-Rivers Museum, Oxford).

Recapitulating, we find that so far we have traced the double spiral as an ornament for the ear to Sumatra, the Naga Hills, Central Tanganyika and the eastern side of Lake Victoria. It would be very interesting to hear of its further distribution as an ear-pendant in East Africa and elsewhere, and especially to learn whether it is known in Madagascar. Braunholtz has been unable to find an example in the Madagascan collections in the British Museum.

Let us now pursue it further afield. As an amulet or charm, as a public ornament for men and an ornament worn in women's hair and on necklaces (?), it has a wide distribution both in time and space in Northern Africa. It may be noted in passing that the earliest places to which Arkell has succeeded in tracing it are outside Africa altogether, being first a site near the southern end of the Caspian Sea provisionally dated 2500 B.C., and secondly a site in Italy of the fifth century before Christ. Coming to Africa, he writes that it is occasionally worn in the hair at El Fasher, Darfur, by women of the Aulad Suliman who came thither from Tripoli twenty to thirty years ago, and is sold in Cairo as a charm for new-born babies. He also found it in some rain-eroded graves near a ruined stone town at Uri in Northern Darfur which he tentatively assigns to the thirteenth or fourteenth centuries *anno Domini*, and he suggests that it was there worn by women in the hair or round the neck. From West Africa, the British Museum has a specimen obtained among the Mumuye of the Yola province, Northern Nigeria, and said (by D. MacBride, 1930) to have been worn by men as a pubic ornament, though according to the original donor it was a woman's ornament; and C. K. Meek in "Tribal Studies in Northern Nigeria" gives a picture of an elder of the Ndoro tribe (Gashaka, Northern Cameroons) wearing a large one as a pubic ornament attached to his loin cloth.

In its northern and western distribution, then, at the present day it appears to be used for a variety of purposes other than an ornament for the ear, and in its southern and eastern distribution exclusively as the latter; but it is evidently a very old type of ornament and a link between the two distributions may well be found. In so far, however, as its present uses are concerned and with such information as we have obtained to date, it is not unreasonable to put forward tentatively the hypothesis of diffusion from an easterly source for the ear-pendant of Tanganyika and to include it in this discussion of Indonesian echoes.

Its presence among the Southern Jaluos may seem at first sight to make this hypothesis untenable, since the Jaluos came from the Nile. But against this we must set, first, the fact that those of North Mara, at least, have a tradition which attributes their ornament to the Masai, in which case it must have been acquired by them since they left the Nile area and if, as one may suppose, they mean those Masai who live nearest them, i.e. those of Tanganyika and not those further north in Kenya, then the direction from which they obtained the design accords with our hypothesis. Secondly, Baker's wearer of the simple form belonged to a clan which though loosely called Luo is really of Bantu stock and did not come from the Nile. Although one could, of course, argue that the design may have been introduced into this clan by the immigrant Nilotes, it is at least equally possible, and in view of tradition more probable, that diffusion was from some of the southern peoples, whether those of Bantu stock or the Masai, to the incoming northerners and that the latter did not bring it with them.

And now after all, in spite of our declaration that we were not going to enter the canoe controversy, at this point we can hardly be expected to forbear from casting an interested and inquiring glance in that direction; for on the tentatively proposed hypothesis we have been discussing and in view of the Indonesian connection which it implies, the trail of our Indonesian echoes in Tanganyika would appear to lead us to the very edge of the Victoria Nyanza with its much-disputed craft.

CONCLUSION.

There are one or two further points insufficiently investigated to appear in print among the suggestions put forward here, but which we should be glad to discuss with any one interested in the subject. We do not propose to attempt any conclusions on the slender material so far collected, our purpose being rather to draw attention to a promising line of inquiry in the hope of stimulating others to bring forward further data. The extent and importance of Indonesian cultural influences, and possibly physical too, in this Territory and elsewhere in Bantu Africa⁽⁴⁾ are not yet fully understood and the subject naturally excites the curiosity of people interested in the past and present contact of peoples and the diffusion of culture.

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- (1) "Indonesian Influence on East African Culture," *J.R.A.I.*, LXIV, 1934.
- (2) HORNELL, *loc. cit.*, quoting from FERRAND: "Le K'ouen-louen," *Journ. Asiat.*, XIII.
- (3) EBERHARD VON SICK: "Die Waniaturu (Walimi)," *Bessler-Archiv*, B. G. Teubner, Leipzig, 1915, Band V, Heft 1/2, p. 57.
- (4) For example, the case made out for contact between Indonesian and Bantu cultures in Rhodesia in the famous ruins, cf. Hornell's illustrations of Nanatali, Rhodesia and Boro-Budur, Java, *loc. cit.*, plate XLII.

Details of a Native Medical Treatment

By Hans Koritschoner

MEDICAL science of the native consists in the knowledge, for the most part inherited, of but few diseases and many medicines. This is easy to understand as his diagnosis takes no account of the causes of the sickness but only of its symptoms. For instance, if the patient has something wrong with his *tumbo* (stomach), a specialist in such troubles is called, who starts without hesitation with the corresponding treatment. He will not thoroughly examine the patient, being guided by a medical intuition which he has gained by his experience. He will administer one after the other of his drugs till he notices an effect; then he continues in the indicated direction. Meanwhile he makes use of many treatments of general application which give the patient relief.

The position of the native doctor is a very easy one. Any failure of his treatment not only he, but also the patient himself if he is still alive, ascribes to a specially powerful bewitching. Therefore the treatment usually includes both the administration of drugs and anti-witchcraft measures.

It can be said that all natives are convinced in their inmost hearts that every illness has its origin in a hostile witch doctor. I have often noticed a collapse quite out of proportion to the gravity of the illness, especially when it started suddenly. This is the more remarkable when it is borne in mind that the native is very insensitive for instance to wounds, as he showed during the war. It is his firm belief that he is bewitched that makes him so despairing.

These generalities are well illustrated by the case of which I give here the details, gleaned in the course of eight days' continuous observation.

The plants quoted in the following pages were gathered on the spot and identified by Mr. P. J. Greenway, Botanist of the East African Agricultural Research Station, Amami, to whom I wish to express my thanks. Acknowledgment is also due to Mr. R. E. Moreau, Secretary of the E.A.A.R.S., Amami, for helping with the translation.

I was collecting plants in the Western Usambaras when one day early in the morning my guide came and explained that he had no time to go with me, as his brother Ali had fallen very sick during the night.

I went to the hut and found the man sitting outside but obviously ill. He was a youth of about twenty and of quite strong appearance. He had passed the whole of the previous day away from home attending some festivity. He had had some *pombe* (native beer), but was not drunk, although he had come home rather late. I had the impression that his brother was more anxious than the case seemed to deserve.

I made arrangements that all the treatment administered should be explained to me and that I should be present, if possible, when all the plants used were gathered. At first the brother himself undertook the case; later when another doctor was called in I succeeded in obtaining the same right.

First day.—After a restless night the sick man complained in the morning only of a sore throat, *mimera* (Shambala).

We went for the roots of *Acacia camphylacantha* Hochst., *Clausena anisata* Oliv. and *Vernonia* sp. These were cut into small pieces and boiled. Ali drank the decoction during the day instead of water.

Second day.—Ali complained of severe pain in the right side of his chest and had high fever but no phlegm at all. The diagnosis given by his brother was *kichomi*, which means a stitching pain in the chest.

We went for *Sterculia rhynchocarpa* K. Sch. (the bast) and *Hibiscus* sp. (two pieces of the stalk three centimetres long). The two pieces were wound round with the bast. One was hung on a string round Ali's neck, the other applied for ten minutes to the painful spot and then thrown on the ground in the belief that it would take the pain away. About 11 a.m. the roots of *Ricinus communis* L. were roasted slightly and rubbed into a few small cuts made on the chest and on the back where Ali complained of pain.

About 5 p.m. as the pain was increasing and also the fever getting higher we went for the plants *Rinorea orientalis* Engl., *Polysphæria Schweinfurthii* Hiern. and *Securidaca longipedunculata* Fres. The roots of the first two plants were boiled. A small portion of the root of the third was cut small and roasted in a potsherd over the fire, then powdered and mixed with a small portion of *Asclepias macrantha* Hochst. the powdered root of which was kept ready in the house in a small calabash. Both powders were stirred into the decoction of the two boiled roots. This medicine was administered twice.

This compound was stated to help against *kivimbi*, which is simply any sort of swelling and does not refer particularly to a chest complaint.

Third day.—In the morning the patient had high fever and severe pain. He did not speak and refused food. The brother explained to me that from these symptoms he considered that Ali must have been bewitched. All the other relatives were apparently of the same opinion and decided to go to a soothsayer. I did not accompany them but I was told afterwards that the wise man declared that the disease had its cause in a medicine given to Ali, doubtless during the feast, by the husband of a woman to whom he was paying attentions.

We went for *Azima tetracantha* Lam. the leaves of which were pounded in a mortar (*kinu*) and then wrapped in a piece of cloth together with an amulet of Ali's mother. Again a small cut was made on the right side of the chest and the pouch tied on it.

After this, cuts were made on both shoulders, the breastbone, both upper arms, both thighs and the soles of both feet, and the powder out of a small calabash (*tunguli*) was rubbed in. This powder was kept ready in the house and is regarded as a general remedy against witchcraft.

The recipe for it is the roots of *Albizzia versicolor* Welw., *Afzelia quanzensis* Welw., *Combretum gueninzii* Sond. sub-sp. *Splendens* exell and *Erythrina tomentosa* R.Br. Small pieces of these roots are dried in the sun and afterwards powdered. Then the *chingira** is added. *Chingira* is the universal native name for the compound of ingredients thought to be desirable on the principles of sympathetic magic. These *chingira* are variable in composition. There exists a very secret trade in the ingredients, based on the trustworthiness of the trader. Only very small portions are used. Our recipe was said to contain the following ingredients :—

- A piece of the feather of an owl ;
- A piece of the sexual organ of a female witch doctor ;
- A splinter of a tree grown near a grave ;
- A piece of the flesh of a puppy killed before its eyes were open ;
- A piece of the wrinkle from the forehead of a lion ; and
- Some soil of a termite hill from which a rainbow had emerged.

It may be interesting to hear the explanation given to me by the brother for the particular items :—

- The feather indicates the origin of the misfortune ;
- The piece from the witch doctor does the same ;
- The piece from the puppy means that the witch doctor failed to see the right person, therefore his medicine may be powerless ;
- The splinter—?

The piece from the wrinkle gives the strength of a lion to the patient ;
The soil—? (I suggest this may be a symbol for restoration to health.)

This witchcraft medicine is not an original Shambala one but had been bought by Ali's father from a Sukuma. He also sold him the knowledge of the ingredients, which is a different thing.

In the evening a *tambiko* (a ceremony connected with ancestor worship) was celebrated ; I did not attend it in order that my alien presence should not prejudice the favourable effect expected for the sick man. (The proceedings were explained to me later.)

Throughout the third day attention was concentrated on witchcraft antidotes, to the neglect of physical treatment.

Fourth day.—The patient was rather worse than better. He had become very emaciated during the previous two days. High fever, no motion and an attempt to cough. He was also very apathetic. The day before, a younger brother had gone for another doctor who appeared about 11 o'clock. So far as I could observe he did not examine the patient at all. He at first prepared a medicine, boiling the roots of *Ficus exasperata* Vahl. and *Triumfetta pilosa* Roth. and administered the decoction. He explained to me that it was a medicine very suitable for the stomach and that he always administered it first in serious cases. He gave orders for the patient to be washed and laid in a second room on another bed. A potsherd containing charcoal was placed

* This appears to be a variant of *chengila*, some necessary ingredient for any medicine.—
EDITOR.

underneath the bed. This was undoubtedly a useful measure as the patient had been lying until then near the fireplace of the hut, most of the time in such a dense cloud of smoke that it was difficult for me to enter.

About 5 p.m. the doctor made a row of cuts in the patient's chest and back and rubbed in a powder he had brought with him. He gave me the native names of the ingredients but as I could not collect the plants for verification I omit the details.

Then we went for the root of *Fagara* sp. The fresh root was given to the patient to chew as a remedy for a dry throat. Questioned, the doctor gave me the diagnosis *kambako*, a Shambala word which means any disease of the respiratory organs.

At night the doctor put four little sticks at the four points of the compass round the house. They were ready prepared with *lukago* medicine smeared on their points. The recipe of this medicine resembles the one mentioned above with which the patient was vaccinated as an anti-witchcraft measure. It is used on many occasions and is supposed to prevent any evil spirit from entering the house and also to annihilate any kind of bad influence from a hostile witch doctor.

Fifth day.—The patient's condition remained unchanged. A new symptom, a rattling in his chest, was audible from time to time.

We went for the roots of *Sterculia appendiculata* K.Sch., *Pentas coccinea* Stapf., *Capparis kirkii* Oliv., *Achyroserpnum radicans* Gurke., *Schrebera alata* Hochst. and *Securidaca longipedunculata* Fres. The decoction of these was administered frequently but not regularly. According to the doctor's explanation this medicine, especially the root of *Securidaca longipedunculata* Fres., has a diaphoretic effect.

When walking with the doctor I had the impression that he was not searching for certain roots. He was very pleased when he found the *Securidaca* and when we passed a plant of *Pentas coccinea* he would say: "It will do." We saw the *Capparis* and he exclaimed: "Just what I want." It must be remembered that the doctor was a stranger to that locality—although an inhabitant of the same district—and that it would have taken him a long time to look for certain plants without asking a man of the village, a thing he would never do. This shows that he must have had a general knowledge of the medicinal plants of the district suitable for the disease in question.

During the day I noticed that the family, especially the female section, was not very satisfied with the doctor, because in his treatment he did not pay enough attention to the fact that the sickness was caused by bewitching. An old man was called in who was famous for anti-witchcraft medicines.

I am sorry to say that he was inaccessible to questioning, but he did not intervene in the treatment at all. The doctor himself did not know of his intentions. Indeed the patient's brother asked me not to mention anything to the doctor. He also told me that the old man gave him a medicine to sprinkle on the charcoal under the bed and an amulet to put under the patient's head.

Sixth day.—During the night Ali was very ill. At times he became comatose—*amezimika*. Cold water was therefore poured over him. All the relatives were awake the whole night awaiting the end. In the morning he was very weak. The rattling in his chest increased and the fever was very high. On this morning I intervened for the only time, asking the doctor if he would not like to do something to move the patient's bowels. He gave an enema consisting of a piece of soap, castor oil and hot water. It was administered by means of the hollow stalk of a reed, *Phragmites communis* Trin., with success.

As the doctor apparently was afraid to continue the medicine of the previous day on account of the relatives, we went for the roots of *Cassia beareana* Holmes, *Kigelia* sp. and *Hoslundia opposita* Vahl. the decoction of which was administered. I had at the time the impression that the doctor did not think much of the success of this medicine, but that he felt he had to do something. During the day the patient tried to cough but was too weak to do so.

About 4 p.m. we went for the root of *Fagara oliotoria* Engl. It was rubbed on a stone and mixed with a few drops from a lemon. A small quantity was then given to the patient from time to time as a remedy for the "dry tongue." He was washed with warm water.

Seventh day.—The patient showed a slight improvement by taking a few spoonfuls of gruel, *uji*. I had no idea of the amount of food he had consumed during the previous days. According to the statement of his relatives he had refused all nourishment. (Such assertions given by natives are generally open to doubt.)

During the day a slight coughing began, apparently very painful and without any real expectoration. The whole day the above-mentioned medicine was administered and from time to time the patient took some gruel. By the evening the fever had increased again, but the cough was rather easier. The patient was washed with warm water.

Eighth day.—The fever was lower. We went for the plant *Erlangea tomentosa* S. Moore, the leaves and roots of which were steeped in cold water and the solution administered to prevent the vomiting occasioned by the cough. Throughout the day the medicine *Cassia beareana* Holmes., etc., was given.

Ninth day.—The fever seemed to drop and the patient was generally better, but the cough remained painful. He began to take some interest in his surroundings.

I left the place on this day. I heard later that the patient had recovered, but very slowly. I saw him again after about three weeks. He was still rather weak and thin but without pain in the chest, only a slight cough being left. He still drank the last medicine but got no other treatment.

The doctor's fee came to three shillings and one chicken; of this he received one shilling and the chicken at the beginning and a second shilling at the end of the treatment; he has still to be paid the third shilling.

It is a matter of opinion whether Ali was cured by the treatment or by nature!

The Aba-Ha of the Tanganyika Territory—Some aspects of their Tribal Organizations and Sleeping Sickness Concentrations

By J. E. S. Griffiths

THE Aba-Ha tribe of natives live in Uha on the western border of the Tanganyika Territory and fringe on the borders of the mandated territory of Ruanda-Urundi. Their country consists of some ten thousand square miles north of the railway terminus of Kigoma and their numbers are in the neighbourhood of one hundred and eighty thousand. Uha can, like Gaul, be divided into three very definite parts: the Uha of the high grasslands in the south—the altitude ranging between five and six thousand feet—the Uha of the high bush country to the north, and the Uha of the low bush country. In the last area the tsetse fly is found.

The usual type of Bantu society is found among the Ha aristocrats who are in this case generally of Tussi stock, and commoners who are true Aba-Ha. The tribe may be divided into cattle-keepers and non-cattle-keepers according, usually, to the presence or absence of tsetse fly.

The hut and village system of the Ha is very simple. There are no large communal towns but each family group builds its own village and thus forms an entity on its own. The houses of the bush-dwellers are simple and consist of rough, beehive shaped structures, thatched more or less carefully with grass. Hamlets in the lowland country are generally built round water-holes but as these are rare, very large areas of country are left uninhabited and useless. This is a point to be borne in mind when studying the sleeping sickness concentration work.

The customs and ceremonies of the bush native are of the simplest and there appears to be very little which helps to bind him to society or to make him a member of that society. He does not see much of his fellowmen and leads a life very little removed from that of his ancestors.

Among the cattle-keeping hillmen life is more complicated. The people live closer together, see more of each other, and the presence of cattle seems to complicate all ceremonial. The people, too, dare not move very far afield because of the surrounding tsetse fly. This is in direct contrast to the people of the bush who are of a roving disposition and move their villages on the slightest provocation. Many of their villages are very remote.

This inaccessability of the plainsman was very marked in the recent sleeping sickness epidemic which swept through the country. Fortunately, it was not among the cattle-keeping section of the people that the disease was found but among the more unstable people of the plains. This very instability made any action which was to be taken at once easier and yet more difficult.

The people were very difficult to get at and yet, being mobile, they were easier to move than would have been the cattle-keepers.

Sleeping sickness is, as is well-known, carried by the tsetse fly and is fatal if not treated in the earlier stages. The problem facing the Government in Uha was to come into contact with *all* natives living in fly country to enable them to be medically treated. To begin with the areas concerned were surveyed and trained dispensers were sent out to open the campaign. Later, bush hospitals were built. The difficulty of coming into close contact still remained and so it was decided to move all concerned into fly-free areas or into areas which by means of a little work could be made fly-free. This meant the moving of hundreds of families. The natives concerned were told of the project and they were asked through their chiefs to choose areas in which they would like to settle. Each chieftainship was kept distinct as indeed was each sub-chieftainship. Matters, too, were so arranged that a proposed new settlement was in each case in a chief's own country. This point should be stressed for land is very often a touchy question among natives. To understand the Ha's attitude, however, it is necessary to look back to the arrival of the aristocratic Tussi among the Ha. On their arrival they found the Ha were ruled by Teko who at the present day are the priests of the tribe. These Teko were ousted from their administrative duties but were left their priestly offices and certain other functions. Among these functions was the duty of looking after the boundaries of administrative divisions. The Tussi became the ruling chiefs and in many instances the ruling sub-chiefs in smaller areas. This was especially the case in the hills where the incoming aristocrats could continue keeping their beloved cattle: in the plains the chiefs are also Tussi but in most instances the sub-chiefs are Ha; the priests are definitely Ha. Certain specified places were held as sacred, e.g. places where chiefs and ancestors had been buried. These sacred places were in charge of priests and could not be abandoned by them. Where they occurred in areas which had to be evacuated the priest had to be left in charge. The other land difficulty was overcome by the new settlements being situated in part of the original country of the chief. This may have been the reason why so little difficulty was experienced in the actual moving of the natives. They nearly all agreed to move and move they did. They were certainly given the option of moving into areas of any chief they liked as long as they moved out of the bush, or even of moving out of the district altogether, so that generally they had not the feeling of coercion. Another difficulty would no doubt have arisen if the dwelling places of the chiefs had had to be moved—this was avoided.

The new areas were chosen by the natives themselves and surveyed by the Government with reference to suitability of soil and sufficiency of water. Such areas of course had to be limited in size but care was taken in order to ensure that there would be no danger of the area becoming in any way urbanized. Thus each family was given about three or four acres of land and the whole area could be extended as soon as the original piece of land was cleared of bush and cultivated. Provision was also made for the grazing of

small stock. The natives had the whole of the dry season—a matter of about five or six months—in which to complete their moving. The first procedure was to build temporary huts on the new site for the storing of household possessions. Then crops were reaped in the old gardens and everything was transported to the sites of the new villages. In many instances transport assistance was given by the Government—this was especially the case where the old and the sick were concerned.

As will be gathered the translation of hundreds of families in this manner from their original dwelling places resulted in a complete change of tribal ideas. The object was, however, to effect translation without any drastic changes in the economic life of the native. An agricultural-pastoralist he had to remain but carrying on his life in a different locality.

It is interesting to note the position of the chief and his importance in migration of this sort. As has been noted there were few reasons for people living close together in the bush and tribal unity appeared on the surface to be very tenuous. However, where the chief exercised his influence to the good his people followed his orders and moved into concentrations. Where the chief was weak and inefficient his people were scattered and had little cohesion and some difficulty was experienced in persuading them to obey commands.

At first sight it would appear perhaps somewhat hard from the point of view of the tribesmen to have to move bag and baggage from their original villages. But it must be remembered that it was the Ha of the plains that was being moved and the Ha of the plains is accustomed to migrating every few years to a new site for his hamlet. It must also be remembered that the process of hut building is so simple that a complete new dwelling can be erected in a few days. Furthermore, the possessions of the plainsman are so few that a very few journeys will see all transported to a new village twenty miles away.

To return to the examination of the breaking down and building up of Ha society. Tribal life was changed in that it became more concentrated. Life for the majority of people became gregarious instead of isolated, and assumed a much more interesting and a much fuller aspect. The change was in intensity rather than in kind as the new state of affairs had as a basis the life of the past. People began seeing more of each other and incidentally more of their chiefs and sub-chiefs: a stricter discipline ensued and with it a more ordered life. From a social point of view they benefit enormously in that they are able to see more of the people who have come into contact with the outside world. This may seem rather a minor point but it must be realized how very isolated and how very remote from things of the world was the life led by the average bush-dweller. Apart from an occasional itinerant trader he saw nobody. There was but little reason why he should leave his village. Such a visit meant perhaps a ten days' journey on foot to the nearest town and all he gained was a few shillings. The result of this backwater existence was a backwater mentality. The advancing tide of civilization is a factor which cannot be ignored in the study of a primitive people and the easier it is made

for that people to meet and cope with the stream the better. Concentration appears to answer the purpose in that the civilizing process can be regulated.

Turning from social benefits to those of economic value, it is interesting to note how industry is encouraged in a concentrated settlement. Firstly, and most important, the accessibility of the native to markets is increased enormously. However industrious a native is, his labour is wasted if he is unable to overcome the transport problem between his dwelling and the market. Where there are a large number of producers living close together this problem is made much easier. Not only does an agriculturist benefit by being near markets but he is also more accessible for the distribution of seed. Advice too can more easily be given when difficulties arise. Proximity to markets does not only affect agricultural produce but also such articles as honey, beeswax, gum arabic, pots, mats, etc. All these industries too are much more easily organized when dealing with people in the mass instead of in isolated family groupings. To glance at other aspects of native life :

From a religious and educational point of view the native living in a concentrated settlement is easier to deal with inasmuch as schools and mission stations can be built to serve a much larger population.

From a medical point of view the change in the life of the native will be greatest. True the native "doctor" worked his charms in the past but rarely succeeded in stamping out diseases. In a concentration it is possible to have a hospital and trained men who are available for attendance of a large number of people and, what is more important, immediately available.

A last point which may seem of no importance is the effect concentration has on the women of a tribe. Native women are among the most conservative, and new ideas receive a somewhat cold reception from them—until their vanity is touched. The difference between the woman of the bush and the woman of the world is too great to be lasting : silks and satins are opposed to barkcloth and skins : jealousy is aroused and the men of the tribe have no peace until their wives are as well-dressed as those who have come to the settlement from the outside world. The result of family differences is thus felt in the economic life of the tribe.

It may be considered that but one side of life in the concentrations has been touched upon and that all the advantages have been discussed and none of the disadvantages. From a sentimental point of view it may seem a pity that the natives should be forced to live in communities instead of independently in the bush. But where health is concerned such sentimentality cannot be considered. Another objection is one voiced by the old men who find it hard to adopt new ways of living. Married men, too, declare that in a community their wives are not safe from the attentions of the bachelors of the tribe. Such a difficulty, however, can perhaps be left to answer itself.

A much more important aspect which has not been discussed is the effect concentration will have on tribal life and tribal mentality in say ten or twenty years' time. Will the settlements develop into glorified suburbs, will natives who are at the moment handicraftsmen leave their agricultural pursuits

altogether and become specialists alone, will the desire for civilization become too strong and progress be too fast for any benefit to be gained from it? Or, on the other hand, will the settlements continue as they have started—complete agricultural-pastoral communities which will develop hand in hand with other communities in different parts of the country, slowly but steadily, along well-defined lines of progress? The answers in detail to most of these questions only time will give but one can say with confidence that as every effort is being made to develop an agricultural-pastoral community the settlements will partake of that nature for many years to come.

The Menelik Legend

By Rev. R. Reusch

WHEN, in 1923, I saw Mount Kilimanjaro, the highest mountain in Africa, for the first time, my heart became filled with awe, admiration and a feeling akin to reverence. It is not only its grandeur, majesty and seeming aloofness that is so striking but also the realization that, even though lying directly under the equator, it is covered with everlasting snow. Then there are the mysterious and fabulous tales which the ancient Greeks related about it and the vague, uncertain stories of the old Arabic geographers, all of which add much to its fascination. From these ancient times until 1848 the mountain was forgotten. Then it was rediscovered by the missionary Rebmann and, in 1889, was explored and described by the late Professor H. Meyer, both of whom were Germans.

Higher than every mountain in Europe, higher even than the rough, majestic Caucasus, higher than the rocky Elburs mountain-chain in North Persia, it towers over the surrounding country, its snow-covered dome, visible for hundreds of miles, extending upwards towards the blue sky of tropical Africa.

As I go about my work in the hot plains of equatorial Africa, frequently traversing them, the mountain appears to me in the moonlight of a bewitching tropical night as a gigantic, petrified lion with his powerful head resting on his forefeet. And at dawn, its dome covered with glistening snow and ice, I liken it to an immense lustrous jewel in a dark setting. Again at sunrise I fancy that it resembles an enormous altar from the top of which rise vapour-like clouds as in ancient times incense ascended from the golden altar of Solomon's Temple. But, whenever I see it, it makes an overpowering impression upon me, this giant mass of rock which, if one could cut it through from side to side at the height of eighteen thousand five hundred feet, would make an area of more than forty English square miles.

It is called by the Swahili "Kilimanjaro," originally "Kilima Ngaro," or the "Shining Mountain"; by the Chagga "Kibo" or the "Spotted Mountain"; and the Masai call it "Oldonyo Oibor," the "White Mountain." All of these names it well deserves!

Mawenzi, about four miles east of Mount Kibo, irregular, rugged, with many spires, is called the "Second Summit." It resembles a very large, hoary, formidable castle, parts of which are in ruins. It rises to the height of more than seventeen thousand five hundred and sixty feet while its sister mountain rises to the height of over nineteen thousand seven hundred feet. Both are extinct volcanoes.

For thousands of years these mountains have stood becoming more and more interwoven with legends. The old Chagga legend says that once, in

ancient times, when both were still smoking their pipes that of Mawenzi became extinguished. He went to his bigger but younger brother, Kibo, to borrow fire and received it. A short time later while taking a nap the fire in his pipe again went out. And again he went to borrow from Kibo. But this time the latter became very angry and thrashed him so terribly with his club that even now one can see Mawenzi's bruised, battered and torn surface and sense its attitude of austerity adopted after this unjust treatment. The Chagga believe that Mawenzi is ashamed of its appearance and so it covers its face with clouds at every opportunity. And it is seldom indeed that one sees Mawenzi without clouds.

Even in Abyssinia Mount Kibo is known and one remarkable legend, told me beside the campfire by old Abyssinian soldiers and hunters, is connected with this snow-clad mountain. When the first king of Abyssinia, the son of King Solomon and the Queen of Sheba, called Menelik I, who governed Tigré (the oldest province of Abyssinia) as *Negusi-Negeshti* (King of Kings), had completed his successful conquest of Shoa (South Abyssinia), Somaliland, Kenya Colony and Northern Tanganyika Territory—the Abyssinians even now call all these countries Ethiopia—and was on his return journey bringing with him the spoils of war, he one day camped on the desert-like stretch of land which unites Mount Kibo to Mawenzi, at the height of fifteen thousand feet. He was old and tired of life and felt death drawing near. But because he was a king he wished to die as a king. "A king I am and as a king I wish to die," he said to his followers. The next morning he bade his brave soldiers farewell; and, accompanied by a few of his war lords and slaves, who carried his crown, his jewels and his treasure, he began to ascend the mountain. His soldiers from below followed him with their eyes until he reached the boundary of the eternal snows where a dark cloud encompassed him, hiding him from their view. In the evening the war lords returned without their king, for he had entered into the crater of the mountain with his slaves, jewels and treasure. And here, under a mighty dome of ice in a mysterious glistening ice-cave, he went to sleep for ever.

The war lords brought to the army the last greetings of the late king and his prophesy that an offspring of his family will one day arise. He will restore the old glory of Ethiopia, conquering again all of the land down to the Rufiji river. On his way to this river he will ascend Mount Kibo, find the jewels of Menelik I and among them the signet ring of King Solomon which the old king has upon his finger. This ring he will put upon his own hand and from that moment he will be endowed with the wisdom of Solomon and with his power over the spirits. Also the heroic spirit of old King Menelik I will rest upon him.

How strong the Abyssinian belief is in this legend one can see from the following story. When in September 1926, after my first ascent of Kilimanjaro, I came back to the plains and told my Abyssinian friends about it, they asked me whether or not I had seen King Menelik I and his jewels on the summit or in the crater. When I replied in the negative they were astounded and

really doubted my statements, for if I had been on the top I should of a certainty have seen the king and his jewels. Although I gave them every possible proof of my ascent they would not be persuaded but said: "At least you should have seen some trace of him!" Extremely sorry as I was, I could not help it for I could not say that I had seen him or anything pertaining to him.

It is an interesting fact that the Abyssinians believe that their King Menelik II, who died in 1913, should have been this "offspring" of Menelik I. They expected him to conquer Somaliland, Kenya Colony and Tanganyika Territory, ascend Mount Kibo, visit his great ancestor and appropriate Solomon's signet ring. It is true that he defeated the Italians in 1896 and beat the Somalis several times but he did not fulfil the entire hope of his people. Therefore their eyes turned towards another man.

Geratagle, a former Abyssinian soldier of Menelik II, who took part in the Italian campaign of this king, the old Mangasha, who also participated in this war, and the still older Abyssinian, Musa, who remembers King Menelik II as a youth—all three of whom are now living at Lekitatu, Usa, Arusha district—told me this legend in 1926 and assured me that many Abyssinians expected that "the last offspring" of the king's house, "Ras Jason" (his real name being Lidsh Jeassu), would fulfill their hopes, the old prophecy of King Menelik I. In spite of the fact that Ras Jason was expelled from Addis-Ababa by order of Queen Zaudito (or Woisero Zududa) and of Ras Tafari and was constantly watched by the latter, they hoped that this reckless, daring and strong man would after the death of Zaudito seize the throne of Abyssinia, for he had many followers. He died recently however.

As far as I can judge, this legend has a historical nucleus. The Alexandrian monk, Cosmas Indicopleustes, visited Abyssinia in the sixth century *anno Domini*. In his work called *Topographia Christiana* he gives a description of a marble seat, discovered by him at Adulis (Zula) in Abyssinia, with two inscriptions recounting the heroic deeds and military successes of Ptolemy Euergetes (King of Egypt from 246 until 221 before Christ) and an Axumitic king. Cosmas informs us that this Axumitic king, a heroic personality and a great war lord, conquered many countries and undertook many expeditions into the southern countries. Among these countries he mentions "the land of Zingion," that is the country known to-day as Kenya Colony and Tanganyika Territory. From this country the Axumitic king brought many slaves and enormous spoils of war with him back to Axum.

In my opinion it is very possible that the memory of these campaigns of the heroic Axumitic king is preserved in the Menelik legend related above.

(Continued from page 51, No. 1, March 1936.)

The Story of Mbega

By Abdullah bin Hemedi bin Ali Liajjemi

Translated by Roland Allen

CHAPTER X.—MBEGA BECOMES A CHIEF IN USAMBARA.

WHEN he arrived he was welcomed with respect and rejoicing by all the people. They found for him a good house and furnished it, and put a pot of water and a store of firewood ready for him, and they brought him yams, and gave him an ox, and slew it for him and made a great feast. Then they lay down and had much friendly talk, and they asked how he had come so far in his hunting, and he told them all the troubles which had driven him to them and all the friendships that he had made; he left nothing untold from his quarrel with his brethren; and they laid it all up in their hearts. So Mbega dwelt in Zirai and every day he went hunting, and wherever men heard of it, they came to buy flesh and to beg him to go to their land to kill pigs: and he bought mortars and pounding-sticks and pots and all manner of household stuff, and sent them to his companions there in the bush.

** So day by day his fame spread far and wide, and at length the people of Muruwati and Vingo and Manga and Barangai sent to ask him to move to their country, and he was minded to go, but he suspected that since they were subject to the elders of Bumburi trouble might arise. That indeed came to pass; for when he went to Muruwati the elders of Bumburi protested that they had not been consulted and seized hostages. Mbega took occasion by this act to secure for himself a bodyguard, and then by his grace, and justice, and magical powers gradually won the allegiance of the whole district of Bumburi.*

So the people loved him and determined to give him a wife from one of their own villages, and they brought three women and asked him to choose one of them to be his wife, and he chose a young virgin of Lukoka and married her, and all the people without dispute acknowledged him as their Chief. When he went hunting, if he killed many pigs he always divided them equally but took for himself the Chief's portion, a leg and half the breast. So he ruled all Bumburi as far as Mwavura and Panga and Mahezanguru; he was lord of all that country.

Now when he was ruler of Bumburi tidings reached Vuga and Turi its headman, that there was in Bumburi a great magician, and that he knew war

* A page of the original manuscript is missing at this part. The paragraph in italics is made up of conjecture for the sequel.—EDITOR.

charms and that he could bring clouds over the land, and that if any man was sick he healed him. So he gathered all his people together, he left neither old nor young uncalled, and he said to them, I have called you all, men of Vuga, because I have heard that a man has come to Bumburi from Kilindi and the land of Nguu who is a great huntsman and a great master of charms; in war he can throw a spell upon his enemies so that they see neither town nor men; and we hear that he is a goodly person and compassionate; if a man is charged with debt, and has not wherewith to pay, he takes of his own property and pays the debt for him, and now he has freed all the people of Bumburi: there is no doubt of it, they have given him a wife and he has married her. Now, my friends, what ought we to do? What is your judgment? The people answered, Turi, it is for you to choose; if you wish to bring him here, send men to spy out the truth about him. Turi said, To-morrow let men go to Bumburi and ask the men of Bumburi privately, but do not go into the town, invite them to meet you on the road.

At daybreak about six of the men of Vuga set out and went till they came to Bumburi; but they did not go into the town, they stayed at Karange; and they sent a man, saying, Go into the town and choose out all the elders, and let them come here to Karange. He went and gathered the elders together, and they came to Karange, and the men of Vuga asked them about the stranger, how he bore himself in every matter, and the men of Bumburi told them all and hid nothing from them: they praised him in everything. The men of Vuga answered them, We want him in Vuga, we have been sent by Turi our Headman, and he said, If you can make agreement with the men of Bumburi, bring him to Vuga; because we have a great war with the people of Pare and we are in expectation of attack every day. So take him, and let him come with us to work magic defence for us. The men of Bumburi said, It is well; but the stranger has left Barangai; the men of Barangai have taken him to Zirai, and the men of Zirai have taken him into the bush, as we hear; for there in the bush, Mbega has left many of his kinsfolk. So wait here and we will carry him your message and bring you an answer. They went and told Mbega all the words of their visitors; and Mbega said, I have heard, make them a feast and cook food for them and give them much meat, that they may be filled and sleep, and do you treat them well, but I myself will not meet them, because they are strangers who come from afar, and it is not good for me to meet them. The elders answered, It is well, let us go to our guests, and they went and came where their guests were; and they brought them into the town and gave them a good house and furnished it for them and they gave them an ox and slew it, and provided for them a great feast, and waited on them well; and they slept there. In the morning food was cooked for them even more than the day before, and they ate and were satisfied. Then they said to the men of Bumburi, Did you not say that in the morning you would give us an answer? They said, Wait whilst we go to tell our Chief, and they went and told Mbega, Our guests have eaten and they want your answer. Mbega said, Tell them that Mbega says, I cannot see them;

but when they go home, let them give my greetings to their Headman, and if he wants me, let him come himself in person that we may meet and know one another and talk over the matter. They said, We will go and tell them ; and they went and told the men of Vuga the words of Mbega. They said, We have heard, we will go our way ; so they took leave and departed.

When they came to Vuga they lay down to sleep, and in the morning all the people came together and asked them their news. They said, We came to Bumburi, but we did not enter the town. We slept at Karange. We called the elders of Bumburi and they all came and asked us our errand, and we told them, they said, We have heard, wait for us ; and they went and asked that stranger their Chief, and when they returned, they took us into the town and gave us a big house and brought us a bull and we killed it. They told us, When you have cut up the ox, take a leg and half the breast and send it to the Chief's house ; and we sent it. They made us a great feast, and we ate and slept. In the morning we said, We want to start on our journey ; but they delayed us and prepared for us food even more than the day before. We said, We are anxious to be off, and they went to ask Mbega's permission for us to travel. When they returned, they told us that their Chief said, Let the strangers go, and give them meat and pack for each man of them a load of pork to take to his children. So we took leave of them with fair speeches in peace with rejoicing and laughter of men and women, and they conducted us as far as the river. Yet Mbega we did not meet : he says that he wants our elders of Vuga, and our Headman to go to him. That is our message from Bumburi.

The elders asked Turi, What do you think of that message? He said, I must go to Bumburi, because the war in which we are engaged is a great one, and this man is a mighty worker of charms ; so I am resolved to go the day after to-morrow. The elders said, We must go with you. He said, We start the day after to-morrow. They all agreed ; they were all of one mind ; there was no dissension. They slept that night, they spent the day, and in the morning all who were in the villages came together to Vuga, and they said, We are ready for the journey. The Headman Turi answered, Come then. And they took up every man his shield and his horn and his flute.

CHAPTER XI.—TURI GOES TO BUMBURI TO CONFER WITH MBEGA BUT FAILS TO COME TO AN AGREEMENT.

Turi set out with the men of Vuga, a very great army, young men and elders, with two war horns and his flute and his signal horn, and they took five oxen as a present for Mbega. They went that day as far as Zeba and they halted there. In the morning they started and went to the river of Bumburi, and they all bathed in the water and put on full dress, and they ordered the war horns to be sounded and the flutes and the signal horn, and they came to that place where the first messengers halted, that is, Karange, with song and dance, and every man vaunted his prowess and glorified his country and boasted of his pre-eminence and rank. And Turi their headman

was received with loud shouts of applause, and he proclaimed his skill in his craft and his eloquence, and glorified the fire of his forge, and boasted how he slew the men of Pare with his spear, and how he beat out arrows and hammers and axes and knives, and he could make bracelets, and he boasted that he was rich in oxen and goats and sheep, and he proclaimed that it was he who protected all the people and cared for them with gentle kindness; and at every word he asked his people, Is this that I say true or false? And his people responded with one voice, It is true. When they had ended, Turi sat down to rest, and all the people sat and rested, and the children were left playing, and song and the sound of the horns did not cease.

When the men of Bumburi saw the multitude with their horns they too came with their horns, and all the people assembled and they filled the town, and they went round the town singing, and came to Mbega and told him, The headman whom you called from Vuga is here at Karange, what shall we do? Mbega said, I have heard his speech of triumph when he vaunted his pre-eminence, his wealth and his skill in magic and in his craft of working iron how he could make all manner of weapons. I have heard all his words. Are they true or false? They answered, What he said is true. Mbega asked them, Is that man a governing chief, or only a headman of the town, or of a clan? How is it that you all acknowledge him as your headman? The men of Bumburi answered, Whoever comes to this country of Usanibara must admit that he is Turi's man. That clan holds the country, because God gave them the gift of working iron and skill in war, that is how they got the country. He asked, What kind of magic has he? They said, He has a magical power by which he harries the country with fire and sword, and so he has got the land of the people who ran away, for they have fled from the country of Vuga from the time of his forefathers, and so they are pre-eminently Men of Vuga. None but they have ornaments, nor dares to boast himself a son of the country. The very name "Turi's people" means that they did not come from another country, but that they had their origin there on the spot, for Turi is the name of the Hill of Vuga.

Mbega said, I want to meet him. But gird yourselves, and when you are ready tell me that I may go to meet him. They girded themselves and went and stood before Mbega and said, We are ready. Mbega went out wearing a leathern cloak softened with the fat of oxen and dressed with butter, and he had girded on his sword, and carried his club and his spear, and he looked at the sun, and he said, Why is the sun so very hot? The men of Bumburi answered him, The sun is hot; but what can we do? Our guest has been out here since morning.

Mbega said, Let one man go, a man of understanding, and let him tell our guest to excuse me that I may tell the clouds to cover the sun, because we cannot greet one another well in this glare. One went to the Headman Turi and told him the words of Mbega. The people answered, How can he cover the midsummer sun? Let him come, and let us meet. Mbega took his little gourd and he put water in it and shook it, and he took a stick of burning

firewood and he tapped it on the ground, and sparks of glowing charcoal were scattered about; then he sprinkled the water from his gourd on it, and the water quenched the charcoal, and steam went up in great clouds so that the sun was hidden and could not be seen because of the clouds. Even there where his guests were they felt the chill, and they thought, This man is a magician, and a master of black arts also; he is too powerful for us. We must not mock him, for he can put spells on us and we shall all die. Then Mbega said, Now let us go to our guests; the sun is hidden; let us meet them at once.

CHAPTER XII.—MBEGA MEETS THE ELDERS OF VUGA.

Mbega and the elders of Vuga met, and they all greeted him with respect courteously, and they bowed themselves before him with fear and kissed him. Mbega sat down. They noted the calmness of his countenance, and the beauty of his eyes, and his speech, and the sound of his voice—he spoke, a man could pay him close attention. The men of Vuga saw the truth of every word that they had heard in his praise; and children who came to gaze at him could hardly see him for the press, for the multitude thronging him was exceedingly great. The Headman Turi said to Mbega, I have come to fetch you, did you not see my people the other day? He said, I saw them. And did they not come to your house? He said, They came. Turi said, Now I want you to agree to come to Vuga. But, Mbega said, I have conditions to make. The people answered. Tell us your conditions. He said, There in your country, when you build houses, what do you thatch them with? They answered, With grass mats and leaves of banana trees. Mbega said to Turi, We have finished our formal greetings, let us part; after that I and you will meet; and he departed and went into the town.

Then Turi said to the men of Vuga, Let men of understanding take these oxen and give them to Mbega; but when you get to the town with them call the elders and give them to them and say to them, These oxen are from the Headman Turi and his people; he has sent them as a present to Mbega. So they took the oxen and said what they had been told, and the elders of Bumburi told Mbega. Some oxen have been sent by the men of Vuga and they have come to give you their present. Mbega asked, How many? And they said, Five. Mbega said, You elders take two, and give one to the young men, and one to the guard, and give me one, and then go to Barangai and take twelve oxen and bring them speedily. They went and brought them and they told him, The oxen which you sent us to fetch are here. Mbega said, Give them to the men of Vuga for a feast, but tell the Headman Turi when he kills his ox to send the right leg and half of the breast and one kidney and a slice of the liver to me, for that is my due. They went and told Turi as Mbega had ordered, and they caused it so to be done.

Then at last Mbega and the elders of Vuga and the Headman Turi met again, and they talked together, and they agreed; but Mbega said to Turi, Yesterday I asked you, In your land when you build with what do you thatch?

And you told me, With banana leaves. Well I told you that I have a condition to make, and my condition—if you and your whole tribe, all the men of Vuga, really want me, I will state my condition, but will you grant it? They said, We will. Then he said to them, I want to send you to Zirai to speak with them and to tell them these words: You have a guest-friend called Mbega, a worker of charms and a hunter; we have seen him and spoken with him and asked him to let us move him from Bumburi to Vuga that he may supply us with war charms, and he has agreed to come. Now we want your judgment. And if they say that they agree, tell them that Mbega says, If they agree let them go and build a house for him, not a big one, let them build it in one day and thatch it in one day, but let them build it strong, and when it is finished let them go to the bush where the men of Kilindi are and let them tell them, Mbega sends you his greetings; you have not seen him now for a long time, but he wants you to give us his little wallet which has a case of skin that we may take it to him. They may not give it to any others but only to men of Zirai.

Turi answered Mbega and said, I will go to Zirai, but let me leave you within the borders of Vuga. Mbega answered, It cannot be now; but when the house is finished, let a man of standing come to fetch me, and do you sit still, because this house which I said should be built by the men of Zirai is the house of the charms which I command, and if they bring the charms, they must not go into Vuga with them, but they must put them down on the road near Vuga, and when the house is finished the man who comes to fetch me must not leave the man of Zirai who has hidden the charm; let him come with him to fetch me.

All was done as Mbega had ordered, and the house was built at Kihitu, a grove near Vuga where the Headmen of Vuga were buried. Then at last Mbega went to Vuga taking with him his wife and one of her brothers to keep her company. On their way to Vuga they arrived at Kihitu.

Mbega said, Let us go to the grove; and when they stopped there, a man of Zirai appeared and said to Mbega, I have hidden your charm here, if you wish I will bring it, and Mbega said, Bring it, and the man brought it and gave it to Mbega. They slept there that night and the next, and that night whilst they slept a lion came upon them, and all the people were scattered. Mbega asked, What do you flee from? They said, A lion, do not you hear it growling? He asked, Where is it? They cried, He is here. Mbega took his spear and went out, and followed it, and came upon it, and he cast his spear and struck it, and the spear went into the head at the eye, so that it could not move nor roar again, and he left the spear for he could not draw it back, and he cried to the fugitives, Come back, come back, the lion is dead, come back, come back, and they returned. They asked Mbega, What did you do? And he said, At first I left it alone, and when it growled I followed the sound, and I cast my spear, and I listened but I did not hear it utter a sound again, and I think that it is dead, for since I was born I have never once struck at anything and missed and I say that to-day I have killed it, it cannot

fail to be dead. The men of Vuga said, We will look in the morning, and if it has run away, we shall know.

When dawn broke they waited till the sun was up, and then Mbega went to look, and where it had stood he saw flies crawling on its mouth and nostrils, and he crept up to it and saw that it was quite dead. So he cut off its tail and went to his companions and showed it to them, and they all acknowledged that he had really killed it, and they asked, What shall we do now? He said, Cut off its head, and strip off its skin, but skin it carefully; do not cut the skin, nor make holes in it, nor take off any flesh with it, skin it well. So they went and skinned it. Just then men of Vuga appeared with their Headman Turi, and they had put on their weapons, and they came with haste. They asked, What has happened to you here? We heard that you had come here we were told that you came to the grove the day before yesterday. Last night we were surprised to hear cries and shouts; that is why we have come in force. What have you seen? Mbega said, When we came here the day before yesterday we stopped because we waited for the men who were behind. Yesterday they had not come, so we lay down to sleep. In the night a lion came upon us and some climbed into the trees and others ran away, but I followed the beast and when I got where it was I cast my spear at it and struck it. I heard no sound after that. It was still; so I returned and called and some came back, others I did not see till morning. When they came, I told them, The lion is dead and this is its tail. They were convinced and said, Where is it? And I showed it to them, and now they are busy skinning it. If you like you can see for yourselves. They went to look and they saw; and they returned to Mbega and said, We will go home; will you come to-day? He said, I will not come without the skin; when it is dry I will come.

The men of Vuga went their way and the others returned to their work and they brought the skin saying, We have finished the skinning. Mbega said, Cut down many trees large and small and bring them to me; and they went and cut trees and brought them, and he said, Make a pile and stretch the skin upon it, but do not let it touch the ground, because I want to sleep upon it; I will not have ox skins any more. They stretched the skin and waited till it was dry and they told him, It is quite dry. He said, Take it off, and do not throw away the claws; collect them all and bring them to me; if one claw is lost you will spoil my hunting. They gathered them together and gave them to him, and he laid them up. In the evening he slew a sheep and gave it to the men who had skinned the lion and said, You may seek wives, you have touched the blood of a lion. After that he said, We will go on our way; and they set out that night and went quietly into Vuga.

CHAPTER XIII.—MBEGA AT VUGA.

In the morning they beat the war drum to call the people to greet Mbega, and when the people heard the sound of the drum they came in their multitudes, for the sound went throughout all the land; there was not a man that did not come, and every one who came came with haste shouting his courage

and his virtue, and asking the meaning of the drum. Every one who came asked what it was about and no one could tell him. Men came from all the towns and all the country round about, even from Bumburi and Zirai. And when they demanded to know the meaning of the drum, an elder of Vuga stood forth and said, We saw a stranger come into our town last night and we received him, and he slept here, and we took counsel and we said, It will not do to discuss this matter without calling all the people to come, and we said, If we send messengers it will take many days because the country is large; that will not do; but let us beat the war drum, that will reach all, and wherever the sound is heard the people must come. That is the meaning of the drum.

When the elder of Vuga had finished speaking, an elder of Bumburi stood forth and proclaimed his name and title to a respectful hearing, and he said, We entertained the stranger as a hero and a wonderworker. You could not send a man to us, but you have beaten the war drum. When we received him we did not beat a drum nor call the people. You have all heard of his praise and of the position which he had with us; that is why you coveted him and came to fetch him. We did not refuse; we gave him to you, and you brought him here.

When the elder of Bumburi had finished speaking another man of Vuga stood forth and said, What have you said, you man of Bumburi? You had good reason not to beat the drum. If you had, who would have attended. Does the man who hears your drum come? All men listen, all ears are towards Vuga; and this stranger now that he has alighted here has no other place to go to; his wanderings are ended. That is why we beat the drum for all men to come and settle him here. If any man wants the new story let him come to Vuga; if any is sick, let him come to Vuga; if any have law suits, let them come to Vuga. Every matter good and bad always comes to Vuga. You people of Bumburi, if you had beaten the drum, what would you have said to the people? You would not have dared to say words like mine, because you are dependents, and you all answer to Vuga.

When he ended, another man who came from Ubiri stood forth and said, Now cease this dispute, and show us the stranger that we may know him. The people said, That is what we want. The men of Vuga called the men of Bumburi and said, Come. A man of Vuga led the way, and a man of Bumburi followed him, after the man of Bumburi came a man of Ubiri, after the man of Ubiri a man of Rungui, after the man of Rungui a man of Mlalo, after the man of Mlalo a man of Mlola, after the man of Mlola, all the people of Usambara. They went in and they saluted Mbega and saw him, they saw his fine bearing and the grace of his countenance and his eyes and his smile and his stature; of all the men of Usambara there was not one who was up to him by half a head. He overtopped all who were there.

Then they all went apart by themselves and they chose out from each country two men who were men of understanding, and they sat down by themselves and discussed the matter. The men of Vuga said, He is our king

without a doubt. The others asked the men of Vuga, Tell us, what is that man's origin, and whence does he come? The men of Vuga answered, We do not exactly know. We hear that he is a man of Nguu, but others say that he is of Kilindi; the people who know the truth are the men of Bumburi. The man of Bumburi was asked and he said, I know him, but let us ask the men of Barangai for the facts. They said, we do not know precisely, let us ask the men of Zirai. They asked the men of Zirai and they said, We know him by what he told us himself. When we saw him in the bush, we heard him and his companions talking the speech of Zigua. We brought him into our town. We cooked food for him and killed an ox for him; and there was not one man who left the house, we all lay down there and we talked all night. We asked him his story since he left home, and he told us all, he did not omit the charges that his brethren laid against him. He told us that he ran away from home and went to the country of Kilindi and stayed there a year and six months, and he told us the friendships that he made there, until he fled from Kilindi and came to Vuruni, to that clump of trees where we found him and his companions, and brought him to Pangai the land of Zirai. That is his story which you ask us.

The others said, We cannot help wanting him to be our King because of his craft and his beauty and his eloquence. It was certainly because they saw his beauty that his father and mother could not kill him. A man of Vuga said, The matter is ended, he is our King. Let us bring him out and take his hand and let all the people see him. They brought him out into the courtyard to the multitude and took his hand to signify that he was indeed their lord, and they proclaimed, Every word that he says we accept, and if any man refuse, and he says, Let him die, we will kill him by universal consent. The whole assembly responded. Then two oxen were killed, and the people ate and took their leave and departed each man to his own place. So the men of Vuga dwelt with their King, and he governed and enforced the laws, and all the country brought their questions to him and he decided them, and no one could dispute his decrees, all approved of them.

CHAPTER XIV.—THE BUILDING OF THE GREAT HOUSE AND THE BIRTH OF BUGE.

One day he called all the elders in the town and said, I want a large house, because I see that my wife has conceived and is with child, and I see that her days are nearly fulfilled; so I want a house quickly. The elders answered, We have heard, we will set all the people of Vuga to work. He said, It is well.

In the morning the people were called together and were told about the building and they agreed and fixed a day to cut trees. When the trees were ready they were brought in abundance, and they went and told Mbega, The trees are all here; and he said, To-morrow we will set up the house. In the morning all the people came and they asked the King, Where do you want the building? And he said, The plot is up here. They set up the house and

they bound the poles together and finished their work. Mbega brought an ox and gave it to the builders and they slew it and they gave him a leg and half the breast, and then they went home to sleep.

The next day the trees for the roof were brought in, and the third day builders came and set the roof beams in order and fastened them and finished their work. Mbega brought an ox and gave it to them and they slew it and divided the flesh and they ended and went their way. The people of the town said to the Headman Turi, In the evening blow the horn that all the women may bring mats, and he said, It is well. At sunset Turi gave orders, Let the crier go and blow the horn to tell all the women, Bring mats quickly, and if any is away, tell her when she comes, and in all the villages outside tell them, Bring mats. So the crier went out and cried, H-u-u-u-u, silence, silence, listen to me. To-morrow the women are to bring mats. All of you tell every woman who has a house to bring one mat. The house of the king is to be thatched. Then he returned to his house, and they lay down to sleep. In the morning all the women came with mats in abundance, and those who were outside the town in the farms and villages brought mats. So the people told Turi and said, The mats are here in abundance; what are we to do? Turi said, Wait, let us report to Mbega, and he went and told Mbega, and Mbega said, Begin work to-morrow. At dawn the people came, and they thatched the house, and nothing was left undone; they finished the work in one day. And Mbega brought an ox and gave it to the doers of the work, and they killed it and divided the flesh and went home.

After this the elders said to Turi, What is to be done now? The house is finished; let us go and tell him. Turi said, Yes, let us go; and they went and told him, I have come with the elders, we want to know your mind, the house is finished. Mbega said, Wait till sunset, and then do you, Turi, come with one boy. He said, It is well. In the evening he came and said, I have come, and Mbega said, Wait a little till the sun has set and the people are in their houses, and let no one go out of his house. And Mbega said to Turi, Come into the house; and he went into the house, and they performed their rite, and they bound up the charm, and they took a sheep and killed it, and they took the head and put the charm into it and wrapped it up in a black cloth, and they went with it into the house and they dug a hole in the middle where was the centre post and they buried the head there. Then they lighted a fire with firesticks, and they went away. Young unmarried men were gathered to the house and they were told, Take this flesh and go eat at the new house, but do not lie down to sleep, put firewood in the kitchen, and when day breaks go and look for many palm ribs and bring them. Mbega and Turi went and lay down.

In the morning all the young men went to cut palm ribs, and in the evening they returned and they were given a goat. Then Mbega said to them, To-morrow look for two heavy poles and large stones. They went and brought the stones and the poles, and when they brought them they were given a goat. Next morning Mbega said, I want two men to go to cut very straight palm

ribs, and they went and brought them. Then he said, To-day is a day of much work; bring adzes and trim the posts, and they set them up and laid the stones on this side and that, and they laid the palm ribs so that they were level, and he fitted up his bed chamber, and it was finished. Then he said to the young men, Sweep all the house, and they swept it; and they took the palm ribs which were over and made a door, and they finished when the sun had set. Those who did the work were given an ox, and they ate.

In the morning Mbega said to the young men, Bring logs of wood that there may be a great fire in the house, and they brought logs in abundance, and they were given a goat. Then he called Turi and said to him, Bring out the crier to call women and men to come to-morrow to plaster the house, the women to carry water, the men to dig clay, and others to mix it and others to carry it, and Turi answered, I have heard, they shall be here at dawn.

At dawn the women brought water, the men dug clay, others mixed it, and others carried it and set it in the house, and others did the plastering, and at sunset the house was finished, nothing was left undone. Mbega brought three oxen, one for the men, one for the women, and one for the young men. They killed them all and they divided the flesh and they went to their houses.

Now Mbega determined to move house. That night he called the people and said to them, To-day we must not lie down. I and you have work to do. They said, Tell us all that you desire and we will do it. He gave them root fibres and said, Cleanse them thoroughly; to others he said, Twist them into a crown, and fit it to my head, I want it even. They made it fit, and then they put cloth round it and sewed it, and they put on it charms, and the claws of the lion which he killed, and ostrich feathers, and beads, and when they had finished, they killed a black sheep that night.

At cockcrow their work was finished and the flesh cooked, and they ate and then they went with Mbega to his house. The young men were sent away, and the Chief entered with his wife and when they went in the others departed. Then Mbega told one man to bring the skin of the lion, and he brought it; and Mbega said to his wife, Get up now upon the bed and lie on it, and she did so. Instantly his wife said to him, My pains are upon me, fetch a woman to come. Mbega went and opened the door and called a young man and sent him saying, Go and tell the Headman Turi to bring his wife here quickly. The lad went and knocked and cried, Here, and the headman answered, and the lad said, I have been sent by the chief to call you and your wife. Turi answered, It is well, and he said to his wife, Come, let us go. They came and they stood outside and cried, Where are you? He answered, This place is Burira. That word Burira is derived from the speech of Zigua, it suggests that the name of the house is Burira, and Burira signifies the Great House of the King of Vuga. He who is born in it is King of Vuga, and the wife who lives in it, is the great wife of the King of Vuga.

When the wife of Turi entered the house, she said to those who were there, Go out, she is on the point of giving birth. Other women were called, and they came, and soon she brought forth a child safely. Mbega took an ox

and slew it, and put the whole carcass in the house of the young mother, and much food with it, and the people came to offer their congratulations. Every one who came brought a goat. In every town when the people heard that the wife of the King had given birth, they came with rejoicing and fine presents, and sweet kernels and bananas. The whole country heard the news of the delivery of the King's wife.

After that the women were called by King Mbega and he asked them, When my wife gave birth was the skin on the bed? They said, It was there. He asked, Is the child a girl or a boy? They said, A boy. Mbega asked, Have you not given him a baby name? They said, No. He said, A boy is *Simba*,* a girl would have been *Masimba*.

This child was called Simba son of Mwene,† either because Mbega's baby name was Mwene, or because the name Mbega underwent a little change in men's mouths.

[To be concluded.]

*Simba = Lion.

†Simba Mwene probably means *Simba! Tumemwona!*

NOTES

Some Notes on Kilwa *Compiled from various sources*

I.—HISTORICAL.

KILWA KISIWANI is eighteen miles to the south of Kilwa Kivinje and possesses a deep harbour sheltered from all winds by protecting coral reefs. The island is separated from the mainland by a shallow, narrow channel. The population is about six hundred.

On the island of Songo Manara at the south end of the bay hidden in dense vegetation are the ruins of another city unknown to history⁽¹⁾. Fragments of palaces and mosques in carved limestone exist and on the beach are the remains of a lighthouse. Chinese coins and pieces of porcelain have been found on the sea shore, washed up from the reefs.

The Sultanate of Kilwa is reputed to have been founded about A.D. 957 by Ali ibn Hasan, a Persian prince from Shiraz, upon the site of the Greek colony of Rhapta. The new state, at first confined to the town of Kilwa, extended its influence along the coast from Zanzibar to Sofala, and the city came to be regarded as the capital of the *Zenj* empire⁽²⁾.

An Arab chronicle gives a list of over forty sovereigns who reigned at Kilwa in a period of five hundred years. Pedro Alvares Cabral, the Portuguese navigator, was the first European to visit it. His fleet on his way to India anchored in Kilwa bay in the year 1500. Kilwa was then a large and wealthy city possessing, it is stated, three hundred mosques. In 1502 Kilwa submitted to Vasco da Gama, but the Sultan neglected to pay the tribute imposed and in 1505 the city was occupied by the Portuguese. They built a fort (Santa Iao) there, the first erected by them on the East Coast of Africa. The present one, with its three towers, is Arab and is superimposed on the Portuguese fort.

Subsequently Kilwa became one of the chief centres of the slave trade. Towards the end of the seventeenth century it fell under the dominion of the Imamas of Mascat and, on the separation in 1856⁽³⁾ of their Arabian and African possessions, it became subject to the Sultan of Zanzibar and was acquired by the Germans in 1890.

II.—MILTON'S REFERENCE TO KILWA.

The passage in Milton's *Paradise Lost*, Book XI, referring to Quiloa, appears likely to have been suggested by a line in *Stanza LIV* of *Canto I* of Camoens' *Lusiad*. There the Arab chief of Mozambique tells Vasco da Gama

that that particular roadstead is the one sure place for every ship that sails, "from Quiloa, Mombasa and Sofala."

Milton's words are :—

" . . . nor could his eye not ken

Mombaya and Quiloa, and Melind and Sofala, thought Ophir"

Camoens died in 1579 and Milton wrote these lines some time about 1670—so there is a probability that he had read Camoens' poem in some form or other and the names had stuck in his memory. He gives for metrical purposes a wrong accent to *Sofala*—*Sófala* for *Sofála*.

III.—THE CHRONICLES OF KILWA.

The Chronicles of the city and sultanate of Kilwa came into the possession of the Portuguese when they took Kilwa from the Shirazis in 1505. No copy is known to exist now, but Sir John Kirk presented the British Museum with an original abstract prepared from the Chronicles which came into his possession while he was in Zanzibar⁽⁴⁾. The following is a brief summary of the events recorded in this work.

A sultan named Hasan of Shiraz on the Persian Gulf left with his six sons in seven ships. The sixth ship came to Kilwa with Hasan on board. On landing the immigrants found a "muslim already settled at Kilwa with his family and a mosque."⁽⁵⁾ The son of Sultan Hasan bought the island of Kilwa from the chief of the neighbouring Almuli tribe, at the price of fencing it round with cloth. The newcomers found, however, that Kilwa was only an island at high tide, and the first thing they did after completing the purchase was to deepen the channel which dried at low tide. The first sultan of Kilwa was Ali, the son of Hasan, who ruled over Kilwa during the middle of the tenth century and reigned forty years. He established his son Mohamed as ruler of Mombasa.

After some years Kilwa was overrun by incursions of the neighbouring native tribes, and the then reigning sultan—a grandson of the original founder of the city—fled to Zanzibar. Eventually the Kilwa people drove out the invading negroes and the sultan returned and reigned for fourteen years.

The state of Kilwa rose to a position of great influence and prosperity during the eleventh, twelfth and thirteenth centuries. She extended her sway down to Sofala, whence the gold from the Zimbwabwe mines was shipped, and introduced amongst the Persian settlements on the east coast and its islands a high standard of architecture and a refined civilization altogether foreign to Africa.

During the thirteenth century a pretender named Said claimed the throne of Kilwa and he went to Zanzibar to beg the sultan of that island whose name was Hasan, son of Abu Bakr, to assist him in his designs against Kilwa. Said and an Emir of Sultan Hasan set out for Kilwa with a large force but dissensions arose which resulted in the designs of Said coming to naught.

Just prior to the arrival of the Portuguese in East African waters in 1497, the Sultan of Kilwa was named Fudayl and his throne was threatened by a

person called Hasan, apparently the son of a former ruler of Kilwa. Hasan determined to make war on Kilwa, but the Sultan of Zanzibar intervened by sending an emir to Kilwa, with the object of promoting peace between Hasan and Fudayl, on the basis of the restoration of the former to his previous title and power. This intervention was ineffectual and it is related that when the emir was returning to Zanzibar, Hasan advanced and attacked Kilwa but met with a severe defeat. It was during Fudayl's reign that news arrived of the coming of three Portuguese ships under the command of Vasco da Gama.

Abdul Hasan el Masud, an Arab of Baghdad, who died in Egypt in 956, left an account of his journeys to the East Coast of Africa.

Ibu Bahuta, an Arab of Tangiers, visited the East Coast in 1324. He describes Kilwa as large and composed of "wooden houses." In 1331 he called it "the most nobly built city on earth." The king's name was Abu-el-Moyaffir Hussan, who had obtained great victories over the infidel Zenj.

Translations of both the above works are in the British Museum.

According to another authority, the tribute exacted from Kilwa, the predominant state on the East Coast, was two thousand meticals of gold (about £1,100) in 1503.

In 1512 a Portuguese named Duarte Barbosa wrote a description of Kilwa:—

"It is composed of handsome houses of stone and lime, and very lofty, and their windows are like those of Christians . . . it has streets, and these houses have their terraces, and the wood worked into the masonry with plenty of gardens. This island has a king over it, and from hence is trade with Sofala with ships which carry much gold, which is dispensed thence throughout all Arabia felix . . . when the King of Portugal discovered this land, the Moors of Sofala Zuama (Zambesi) and Angoche and Mozambique were all under obedience to the King of Kilwa, who was a great king among them . . . and there is much gold in this town, because all the ships which go to Sofala touch at this island (Kilwa) both in going and coming back. These people are Moors, of a dusty colour, and some of them are black and some white: they are very well dressed with rich cloths of gold and silk and cotton."

IV.—KILWA KIVINJE.

Towards the end of the eighteenth century, it is said, three Nyasa natives with their wives and families eventually arrived at the coast about eighteen miles north of Kilwa Kisiwani. Their names were Mkwinda, Mpangapanga and Muloka. At that time the Persians were still living in Kilwa Kisiwani and the country between Njengera and Tikwira, near Mpara hill, was occupied by the Matumbi of the Mkwera clan. These Nyasa cleaned the bush and settled down, Mkwinda at Mnago. Mpangapanga at Magongeni and Muloka at Matandu, according to the present names of these localities. The head of the Mkwera clan, fearing that these strangers might prove aggressive, went to ask the advice of Sultan Yussuf of Kilwa Kisiwani, who called the three Nyasa to his court. Mkwinda went as their representative and took an oath before

the sultan that they would live in peace with the Matumbi. The boundary between Mkwinda's and Muloka's settlements passed near the house of the late Surbaji Ebji in the present township. In this manner is Kilwa Kivinje reported to have been founded.

REFERENCES.

(1) Burton, who visited the place in 1857, thus describes the ruins: "The most remarkable are the remnants of the Nabhani Mosque, which, blackened and decayed, represents the three hundred and sixty-six of Kilwa Island in her day of pride; the well-cut gateway, the Mihrab decorated with Persian tiles, and the vestiges of ghaut-steps, and masonry lining the shore, showed a considerable amount of civilization. Around it lay the tombs of the Shirazi Shaykhs . . . strewed with small water-washed pebbles." *Zanzibar*, vol. II, pp. 358-9.

(2) "Zeng" or "Zing," Arabic form of the Persian "Zaugh," meaning negro; *bar*, Arabic for *coast* or *country*—hence Zanzibar. The people were known as *Wa-zenji*—? hence *Shenji*.—EDITOR.

(3) i.e. on the death of Seyyid Said of Zanzibar, when he was succeeded there by his second son, Seyyid Majid and, in Oman, by his eldest son, Seyyid Themwaini.

(4) Mr. John Walker, in a recent article in the *Numismatic Chronicle*, states: "Sir John Kirk, who received the Arabic manuscript from the Sultan of Zanzibar in 1877, the year when it was transcribed, presented it to the British Museum in 1883. Before doing so, he wrote on the fly-leaf these words, descriptive of its contents: '*Notes on the History of Kilwa by Sheikh Moheddin of Zanzibar, 1862. From arrival of Persians to Portuguese Conquest.*' Sheikh Moheddin (*Muhyi-l-Din*) must, of course, be understood to have been merely the compiler of the work, since the original author, we are told, was born in the year 904 (i.e. A.D. 1498), during the reign of Al-Fudail, the forty-fourth ruler of Kilwa." *Numismatic Chronicle*, fifth series, vol. XVI.

(5) Major Pearce in his book *Zanzibar* suggests that this Mohammedan was an Indian trader.

An English Flower Garden in the Tropics

By C. Whybrow

NJOMBE, on the southern highlands of Tanganyika Territory and less than ten degrees south of the Equator, is six thousand feet above sea-level. It has a rainfall of about forty inches per annum, all between the months of November to April; the nights and mornings are very cold: for the greater part of the year there is a cool easterly breeze, but during the day the temperature generally rises to about eighty degrees. Such conditions include many of the elements of the English climate, but so distributed that few English garden flowers could flourish, especially during the six months of dry weather, were it not for the plentiful supply of water. The residence of the district officer is on the edge of a steep hill, and close by is a large waterfall, on the Ruhuji river. At the foot of the hill, below the fall, is the vegetable garden and just above the fall a narrow channel has been cut to lead a stream along the top of the hill. From this channel it has been possible to irrigate the face of the hill and to form a remarkable terraced garden, the whole of which is watered with a minimum of effort. The result is that all kinds of English flowers flourish, besides others which are unfamiliar in England. It is a veritable Garden of Eden, in which there may be a serpent, though I did not see one; but the worst enemy of which I heard was a herd of four elephants who walked through the garden one night a year ago!

On the occasion of my visit in September 1935, I counted the following fifty-four kinds of English garden flowers, all blooming at the same time: Ageratum, aloysia*, alyssum, balsam, barberton daisy, begonia, campanula, candytuft, canna, carnation, chrysanthemum, clarkia, cornflower, cosmea, daffodil, dahlia, delphinium, dianthus, eschscholtzia, flax, forget-me-not, French marigold, freesia, geranium, gaillardia, helianthus, heliotrope, hollyhock, iris, lobelia, love-in-the-mist, lupin, mignonette, montbretia, nasturtium, nemesia, ox-eye daisy, pansy, petunia, phlox, polyanthus, rose, salpiglossis, salvia, scabious, snapdragon, stock, St. Brigid anemone, sweet peas, sweet sultan, sweet william, verbena, violet and zinnia.

It will, of course, be noticed that several of these species are not English garden flowers in the sense of being indigenous in this country, but at any rate they are all familiar in our English gardens and are suited to our temperate climate. The amazing fact is that they should all be in bloom at the same time, daffodils and violets side by side with dahlias and chrysanthemums. It will be of great interest to receive a corresponding list of the species which are in bloom in March, towards the end of the rainy season.

*The lemon-scented verbena.

Amongst all the flowers at Njombe there seems to be none which grow in greater profusion than carnations and petunias, and I have noticed the same in other gardens in the Tanganyika highlands, even where the soil is little better than loose sand. Nasturtiums have seeded themselves to such an extent that one frequently finds them growing wild.

Raid!

By E. D. Hone

THE acting district officer at Ngudu had long since forgotten his cares in the heavy slumber of honest weariness when a motor-lorry belonging to the chief of Usmao drew up at his gate and delivered itself of a messenger who did not delay to arouse the sleeper to a dazed consciousness and to hand to him with trembling fingers an urgent and important letter from his master. This was at 3 a.m. on Saturday, the 8th of February, 1936.

The reason for so violent a wrenching of the dark gown of sleep was immediately apparent, for the chief's letter brought news that hundreds of his people were in flight from a ferocious Masai raid that had already resulted in the butchery of men, women and children, and the rape of thousands of head of cattle. "This report, however," continued the chief's letter, in the manner of a BBC news bulletin, "is not confirmed," and he added that he had gone off towards the scene of the alleged attack to find out exactly what had happened.

The district officer meanwhile made his preparations for an immediate expedition against the marauders, but even before he had started the light of dawn revealed in the valley that lies before Ngudu an endless procession of refugees seeking safety in timely retreat. To the people at any rate this raid, confirmed or not, was stern reality. Before them they drove their cattle in thousands, an immense wave that flooded the countryside, sweeping down crops and anything else in its path.

The first step was to get into touch with provincial headquarters at Mwanza by telephone from Bukwimba station in the middle of the Usmao chiefdom, in order to co-ordinate action and, if possible, to secure reinforcements of police. The provincial commissioner was no stranger to the report now made to him by the district officer, for already the roads into Mwanza were filling with frightened Sukuma, and were shortly to become so blocked that motorists were compelled to abandon any idea of using them.

From information collected through various media at the station it appeared that the raid had taken place in the lakeshore chiefdom of Magu and the little border chiefdom of Ndagalu, and it was reported that the chief of the latter had been beheaded by the raiders. Arrangements were therefore made to meet the detachment of police promised from Mwanza at a point on the Mwanza-Musoma road from which it would be possible to penetrate to the headquarters of the chief of Ndagalu (which is inaccessible by road) and at the same time to discover the extent of the havoc wrought in Magu.

Any doubts that might have been held as to the authenticity of the original report received at Ngudu were by now dispelled, and it was therefore with considerable amazement that the acting district officer on his arrival at the

appointed rendezvous met the chief of Magu and heard that no sort of disturbance had occurred in his chiefdom. Evidently the brunt of the attack had fallen on Ndagalu, away out in the bush, and the panic had spread from there direct into the heart of Usmao and thence through all Sukumaland.

But the surprises of this unusual day were not yet complete. On the arrival of the stalwart and well-armed force from Mwanza the expedition set off on foot for the capital of Ndagalu, expecting at every step to be confronted with a horrifying scene of carnage. But the countryside seemed to be as placid as ever; the peasants were quietly working in their plantations and knew nothing of the raid, still less of the death of their chief. Shoulders were shrugged and the cavalcade moved on. And in the evening it arrived at the the chief's village. The first to welcome the district officer was the chief of Ndagalu himself, who was politely incredulous when he was told that by all accounts he should have been a headless corpse. As for the Masai, he knew nothing of a raid by them or any one else. At this point, then, the terrifying bogey was transformed into a wild goose; it but remained to catch and examine her.

On the following morning the police constables were sent out in pairs in every direction with instructions to attempt to trace the scare to its origin and also to pacify and reassure the peasants with whom they came into contact. This excursion fulfilled its main purpose for by that evening the whole story came to light.

In the chiefdom of Ndagalu lived a certain old lady, herself a Sukuma but connected by marriage with the Masai. At some period of her life she had lived with her relations-in-law and had learnt many of the traditional ceremonies of the tribe, one of which was a ritual designed to heal the sick. Having been in poor health for some time the old woman decided to cure herself by arranging a performance of this Masai health rite. She accordingly collected her friends and relatives and expounded to them her scheme. Without ado the party—consisting, incidentally, mainly of women and girls—proceeded to array themselves in Masai war costume under the directions of the old lady and to arm themselves with such weapons as they could lay their hands on. By chance one stalwart possessed a genuine Masai spear which he had purchased in Mwanza some years previously, and this was gladly included as adding a touch of reality to the proceedings.

Preparations complete, the performers set off into the bush and ceremoniously slaughtered a goat in the presence of the headman and elders of the village and many of the villagers. This, however, completed the public part of the ceremony, and those unacquainted with the rites that were to follow returned to the village, leaving the initiates to prepare themselves for the real business of the day, which consisted in a mock raid on a herd of cattle, conducted—and this was essential to the success of the ritual—as realistically as possible.

In a nearby glade there chanced to be a grazing herd which seemed to the performers to be ideally suited to their purpose. Carefully they stalked their

fictitious prey, then suddenly sprang out from the cover of the bushes, brandishing their weapons and uttering the fearsome cries enjoined upon them by their instructress.

So far all had turned out according to plan, but at this point first flickered the terror that was soon to rage through half Sukumaland, to disorganize traffic on the main roads and to call forth the resources of Government in three districts of the Lake province. A young herd boy suddenly found himself partially surrounded by a yelling band of robbers descending upon his charges—no ordinary raiders but as he plainly saw the dreaded Masai themselves. Incontinently he fled to his home and there spread the story of what he had seen. Panic did the rest.

Not in the least aware of the momentous effects of their charitable performance (they had not seen the herd boy at all in the excitement) the quasi-raiders continued their brave charge upon the herd until a bull, furious at this unseemly interruption of his peaceful meal, turned upon his tormentors and drove them in their turn in headlong flight. This concluded the ceremony, and the participants quietly returned to their homes, doubtless with the comfortable feeling of a day's work well done.

It would perhaps be unkind to let it be known among the Sukuma that the old lady at the root of their discomfiture has recovered from her indisposition and is now enjoying excellent health!

The Cleveland Clinic-Museum Expedition to Northern Tanganyika

By Daniel P. Quiring

THE expedition from the Cleveland Clinic Foundation and the Cleveland Museum of Natural History, under the direction of Dr. George W. Crile, has just* completed its work in northern Tanganyika and two of its members have migrated to Masindi in Uganda Protectorate for the purpose of collecting chimpanzees while Dr. and Mrs. Crile have returned to the United States of America. The task to which this expedition had set itself was to make a series of dissections of the so-called endocrine or ductless glands and their nerve connections in a large variety of animals living under natural conditions where the struggle for existence goes on with relatively little interference on the part of man and where it may be assumed that only the fit survive.

When the expedition was first talked of, Africa suggested itself as the most likely locale for undertaking such a study and after Africa had been decided upon Tanganyika promised the most desirable spot in Africa considering our particular needs. After our brief two months' stay in the Territory the author feels that Tanganyika is one of the most desirable spots in all the world, partly for the grandeur and beauty of its scenery, partly for its great variety of animal and plant life and finally for that feeling of individual freedom which one seems to breathe in the very air of the land.

Our camp lay on the western shore of Lake Manyara some ninety miles south-west of Arusha near some hot springs known locally as Map Moto. On one side of us rose the great Rift wall and beyond the mimosa forest extended to the lake. The area formed a natural game pocket and we experienced little difficulty in obtaining the specimens we required. During our short sojourn in this region we secured over two hundred and twenty specimens, representing some ninety species of animals, and performed dissections in the field on one hundred and two specimens.

We were extremely fortunate in having as our professional hunter, Captain J. R. H. Hewlett, of Moshi, who spared no exertion in leading and directing us to the specimens which we required. His constant anxiety for us while in the field was the best evidence of his sincere interest in our individual welfare.

We cannot hope, in a paper of this type, to enter into an extensive discussion of our objectives or of our findings. In due course we hope that they may make their appearance in the proper journals. We cannot omit, however, a word or two concerning the nature of our quest. Briefly, it may be stated as follows: Organic nature is engaged in the utilization and the

*At the end of 1935.—EDITOR.

liberation of energy. Most of this energy originates directly or indirectly from the sun. In the case of the back-boned animals the system which expends energy on a large scale is the muscular system, which acts on the skeletal system, on the vascular system and on the digestive tract. The muscular system in order to liberate the energy supplied by the food which the organism takes in must be activated by a controlling system which is represented in the body by the nervous and so-called endocrine systems. The latter is simply another name given to the ductless glands or the glands of internal secretion. These ductless glands must act constantly in order that the muscular system may do its work. Among these ductless glands the thyroid and the adrenals are primarily concerned in the liberation of energy. The thyroid controls the rate at which the body tissues are burned or metabolized and by their secretions the adrenal glands speed up this action. These last glands are known as the emergency glands of the body. When the animal, whether man or lion, is faced by a sudden emergency or the need for the spending of great amounts of energy in a short period, the adrenals, by pouring a greater than usual amount of adrenalin into the blood, speed up the heart action, increase the blood pressure, build up the muscular tone of the body, restrict the flow of blood to the digestive tract (for digestion may well wait until the emergency is passed) and in general, make an alert fighting machine out of an organism which but a moment before may have been the most docile of creatures. Since some animals are shy, some aggressive, some retiring, while others employ strategy in their struggle for existence, it is obvious that different types of animals expend varying amounts of energy in their battle for self-maintenance. Hence, they may be expected to exhibit varying degrees of nervous and endocrine development. If the amount of energy habitually released is dependent upon the activity of the nervous system and the ductless glands, then such differences should express themselves in differences in the degree of development of these systems. In order to test this thesis it was necessary to examine a large number of animals living under natural conditions in an area where pathologic disturbances in the system are unknown or rare. In the United States our investigations were seriously hampered by the prevalence of goitre in our captive as well as in many of our wild animals. Therefore, we chose Africa for the further pursuit of our study.

If this thesis becomes definitely established it will have a significant bearing upon a number of diseases to which civilized man falls heir. If our premises are sound the explanation of certain of these diseases may be given in terms of hypo-, hyper- or general dis-function of the endocrine system. It has been our object to establish the physical and the physiologic basis for the activating system of the animal body. This thesis we have attempted to prove or disprove by a series of careful dissections and measurements of the magnitudes of these systems.

Our stay in Tanganyika has come to a close. Aside from the scientific aspects of our work, our visit has been most revealing. The unmatched

beauty of the Lake Manyara district has imprinted itself deeply upon us. The wide variety of bird life—European storks in a flock of at least ten thousand, the whirr of countless flamingo wings on a moonlit night, the buffalo herds, the snorting of belligerent rhinos, the thrill of a close approach to an elephant herd, the rush of hippo in what Captain Hewlett calls a “sporting swamp,” the giant bowl of the Ngorongoro crater, the majesty of Kilimanjaro, the long Rift wall, all represent sense experiences which have become our permanent acquisitions.

Some Stories from the Haya*

Compiled by A. W. Wyatt

I.—The Story of the Hen and the Hawk.

ONCE upon a time a hen and a hawk were friends and they lived together in the same hut. Then came a famine and the hen went out to search for food. She was successful, for she met a man from whom she obtained a load of bananas. She was carrying the load along the path to their home, when she met the hawk. "Hallo, hen," he said, "how much did you pay for that load?" "I bought it with my foot," she replied; for, when she saw the hawk coming, she had hidden her leg under her wing. When the hawk saw the hen standing on only one leg he said, "Where is your other leg?" The hen answered, "I cut off one leg to pay for the food. Now when you get there you must also cut off a leg and buy more food." The hawk said, "Certainly."

So he went to the man and after greeting him, said, "Look here, man, you may cut off my leg and give me a load of food." The man said, "Stretch it out, then, so that I can cut it off." The hawk put out his leg and the man cut it off. Then he went into the house and brought out a load of food and handed it over. The hawk put it on his head and went away. He had to walk on one leg only and soon had no strength left to go on. He went along stumbling and falling so that at last he threw down the load. When he got home he saw the hen standing on two legs, and exclaimed, "Hen, you have cheated me! You told me to go and get one leg cut off. Now I have had it cut off and I cannot walk. You were my friend, but now you have cheated me. I shall kill you." The hen said, "No, you won't, for I can run away." So she ran away and came and dwelt among men where she hid herself. The hawk said, "Go then, but there will be a child of the hawk which, whenever he sees a hen will say, 'I will kill her'."

So now, whenever a hawk sees a hen, it tries to kill it.

II.—No Wise Man Moves House in the Daylight.

There was once a chief who gave out an order saying, "I desire you to kill all the old men and to clear them out of my country completely. I wish to live with young men only." So they killed them all. But one young man took his father and hid him amongst some rocks and he stayed there. He used to bring him food there.

Now, the chief became so seriously ill that he called his people and bade them go and search for doctors who knew medicines to cure his illness. They went. Whilst they were on the way, they began to consider this order. Then

*Haya is the language of the Bukoba district.—EDITOR.

they came back and said, "The doctor ordered us to kill an ox and to skin it and wrap you in the raw hide. This is the cure." They told him that to deceive him, that they might kill him and divide up his chiefdom.

Then the chief ordered them to bring an ox. They brought one and slaughtered it. Then they skinned it and laid him in the skin and bound it round him. When the hide dried it contracted and gripped him very tightly. He cried out, "I am dying." They replied, "Sir, you are certainly dying." Each day it was so, and not one of them would unfasten the hide.

Now when the others had gone away from there, that young man came and asked the chief, "Sir, do you wish me to go and call a man who can treat you properly for the illness and release the hide?" The chief said, "Go, bring him that I may not die." So the young man went away and brought his father. When he arrived, he said to the chief, "Did you not have all the old men killed off in your country? See now what the young men, whom you liked, have done to you." The chief could find no answer. Then the old man ordered them to bring water. They brought it and poured it in a beer canoe and filled it. He took up the chief and brought him and put him in the water so that the hide dropped away from him and he recovered.

When he had fully recovered, the chief had the drum beaten and all the people came and stood before him. Then the chief gave out another order saying, "Every chief who takes the drum shall not fail to have elder men to consider all matters, because young men are bad; they would kill for no reason and cannot think." He also ordered that the old man who had healed him should have a village and the son became an adviser to the chief.

A Note on the Wambulu

By E. C. L. Lees

RECENTLY whilst on safari in Mbulu district one of my porters requested leave of absence to visit his wife who was sick, and his request was readily granted. A few days later I received a letter from the local *Gausmo* (sub-chief) informing me that the woman had died in childbirth and that the husband wished to remain at home beyond the period originally granted; he also particularly requested that I should keep the man's place open for him on his return. To this I replied with appropriate sympathy and with an assurance that I would take the man on again when he returned later.

In due course he arrived and on the evening of that day, at the time when one begins to think that the cares of the world may be laid aside for a while, six others of my following presented themselves at my tent wearing that queer, wooden expression which one immediately recognizes as the symptom of a *shauri* (matter for discussion).

When eventually one of them could be persuaded to act as spokesman it transpired that owing to their tribal customs they could no longer remain with me if I retained the bereaved husband; especially they could not, on any account, draw water with him as, in this event, their own wives would most certainly die also. They also said that they had intended to work for me until I left the district, a matter of several weeks, and as they were all useful boys I was rather unwilling to part with them; at the same time I had promised to take back the bereaved husband.

I was, however, able to overcome the difficulty by placing the man in charge of my *posho* store at my base camp some miles away and everybody was quite happy with this arrangement.

A few weeks later another porter asked for leave as his child was sick; the child died, and when the father returned I was somewhat anxious to know what was the *desturi* (custom) in this case as I could not provide another job as watchman at a base camp. In this case, however, it was the mother who was taboo.

In both instances the bereaved man was a Christian as was also the *Gausmo* who, no doubt, had a very good idea of what would happen and got a word in ahead so that the first man should not lose his job.

I learned later that among the non-Christian Wambulu, tribal custom demands the isolation of near relatives when a death occurs; this continues for a year and, in cases of death from particularly serious diseases, it extends to two years. No one dare go near the afflicted house, which is allowed to become dilapidated and is eventually used as *kuni* (fire-wood) when the ban is raised. For this reason the Wambulu do not build their habitations in

villages or even small groups of houses, but spread their dwellings in single units over a wide area; this is no doubt a convenient custom as, if houses were built in close proximity to one another, a death would probably result in the evacuation and eventual destruction of a whole village.

The houses are constructed in an interesting manner, being built into the hillsides; the back wall which is really natural hill, being about five feet high (perhaps one should say deep), and the house may extend as much as thirty feet into the cut in the hill; timbers support the mud roof, which becomes grass-covered in time; and when walking down a hill one may easily find oneself walking on somebody's roof!

“Dudu”

By C. B. Garnett

DURING the rainy season of 1927 the incident which I am about to relate occurred in the Kilwa district. I was travelling with porters on a *safari* (journey) in the Mbenkuru valley area and we had progressed for some two hours when the porters stopped for a short rest. The path on which we were travelling was a fairly broad track and walking was comparatively easy despite the tall elephant grass on both sides. I understood the village to which we were proceeding was still some three hours' march away, when the porters volunteered the information that they knew of a short cut which would enable us to arrive at our destination very much quicker. With the prospect of getting into camp before the sun was high I plumped for the short-cut and off we went.

The track certainly was “dead” as it was completely overgrown for long stretches. It was impossible to carry out my usual practice of walking slightly ahead of the porters, and I was eventually compelled to put one man in front of me to act as a guide. We progressed slowly in single file, when suddenly the guide imperceptibly hesitated in his stride and stepping rather higher than usual, said *dudu* (small insect) over his shoulder. I looked down expecting to see a *safari* of ants or something of that nature, but to my horror I saw a large green mamba slowly crossing our trail. I snatched my shotgun and shot the snake as it climbed into an adjoining bush.

In due course we arrived at our destination, and were greeted by the courteous old headman who was expecting us—but not by that route. In acknowledgment of his hope that we had had a good journey, I thanked him and added by way of a pleasantry that I did not like the class of snakes which lived in his area. The old man stiffened and said, “Did you meet it?” I nodded. “What did you do with it?” he asked. When I told him it was dead he and several other villagers who had been listening went off into a veritable paroxysm of jubilation, rolling on the ground, and chanting “*Alhamdu Lillahi*” (God be praised!) coupled with a very comprehensive eulogy of all white men and myself in particular! It was fully two minutes before any one was capable of enlightening me as to the reason for their uncontrolled and sudden happiness. Slowly the old headman explained. “You see, *Bwana* (Sir), the road by which you came has not been used by any one for some months now, that is why we were surprised to see you had come that way. The road had ‘died’ because that snake has been living on it for some time. Three of my people had been bitten and died and everybody was afraid to use it any more. You are the first white man who

has visited us recently, and when your porters saw you had a gun they wanted you to go that way so that you could kill the snake. This is what you have done, and now we shall be able to use the road again."

* * * * *

In the interest and excitement of the day's happenings I omitted to inquire as to the use of the word *dudu*, which seemed hardly an adequate warning of the presence of an ill-tempered and deadly poisonous serpent.

Some months later I was in camp in the northern part of the district and was enjoying my evening bath in my tent, when a snake entered under the canvas. To be divested of one's clothes and sitting in the centre of a small tin bath is not the most suitable position in which to cope with such a situation. I shouted to my boys "*Nyoka, Nyoka* (snake, snake) bring a stick." By the time they arrived the snake had crossed the tent and gone out on the other side. The boys followed but the snake escaped. I was finishing my bath when my headboy re-entered the tent. "*Bwana*," he said, "The snake got away, but I want to tell you that when you see a snake in future say '*dudu*,' then it does not know that it has been noticed, and we can catch it unawares and kill it. If you say '*nyoka*,' the snake hears and knows that you are referring to it personally, and so hurries away."

NOTE ON THE BOWL MENTIONED ON PAGE 36 OF *Tanganyika Notes and Records*
No. 1 OF MARCH 1936.



The bowl illustrated was given to the writer by the late Kadhi of Mafia, Ali bin Athuman, a few months before his death in March 1935. The donor stated that the bowl had been in his family for three hundred years.

It is of a light green colour and highly glazed.

According to ceramic experts, to whom it was taken in London, it is a fourteenth century Ming period trade piece. Such pieces are more commonly found in the ports of India. In spite of its age the bowl is not of any intrinsic value.

The fish's head, clearly to be seen in the photograph, is a Chinese symbol of fertility and is said to be seldom imprinted on articles of this nature. What lacunae of oriental and African domestic history lie hidden in it?—T. M. REVINGTON.

BOOKS REVIEWED

"Kenya, Contrasts and Problems," by L. S. B. Leakey, London, Methuen & Co., Ltd., 1936. 7s. 6d.

Dr. Leakey's views of Kenya's problems have been called "partial." To the present reviewer this seems a wrong estimation of a remarkable book written to show that "the greatest problem of all is that of winning the co-operation, friendship and trust of the natives and thus helping them to develop so that they can take their due place in the Empire." That, by the accidents of his birth and upbringing the author is eminently suited to interpret the natives' point of view to those of us, whether officials or settlers, who are less able to understand it, is obvious; and that, though being applied with the greatest fairness, his honest and courageous yet friendly criticism may "cause pain," is likewise obvious but should not detract from the usefulness of the book. A more serious objection may be found in the regrettable absence of constructive and feasible suggestions towards the solution of the luridly stated major problems.

In a vividly written first chapter the general atmosphere of contrasts, both in the physical environment and in human life, is well caught. Then follows a glimpse into the past million years or so of pre-history; a fascinating story in which facts and fancies, inseparable from the pre-historian's speculations, mingle freely and not always recognizably!

The chapter called "Oddities of Nature," though charmingly written, somehow does not fit into the whole (as the author himself realizes); it draws timely attention, however, to many interesting animals only too frequently overlooked by those who, whether with rifle or camera, are after "big game" only. The chapter on "Safari" is a fair exposition of the pros and cons of porter and lorry transport respectively; but one misses emphasis on the ease and comfort of the really well organized porter safari of the olden days, a slow but efficient mode of travel perhaps better suited than any other for that intimate study of Nature and Man without which the grasping of new lands and of their problems will always remain patchwork.

In "Administration and the Native" there is much sound advice and one looks forward with considerable expectation to the author's promised work on native land tenure for further elucidation of Kenya's most vital problem. Dr. Leakey puts his finger fearlessly on some very sore points regarding the all too frequent and, in his opinion, avoidable misunderstandings between the trustees and the "trusted." His views on the value of cattle and goats, however, will not be shared in their entirety by many and contain arguments dangerous to the future security of the land and its water supplies even though they include much which those who look too one-sidedly on over-grazing as the main source of soil-erosion might well take to heart.

In the chapter on "Missions" one finds some remarkably frank talk on such difficult problems as polygamy, initiation rites, etc., doubly welcome as it comes from the son of a missionary who, no doubt, fully knows what he is saying. But even he can offer no solution!

The difficult problem of the settler is, as already stated, on the whole fairly treated and with a very pleasant absence of that harshness or irritability which so often enters into the debates on this subject. Dr. Leakey maintains that, as a whole, the settler community is disliked by the natives and gives among the main reasons for this dislike those connected with the possession of the land; the fact that natives are not permitted to grow certain cash crops, such as coffee; and the threatening tone of much that is said by a minority of the settlers in association meetings and in the press. The author finds himself unable to justify the commonly held view that the Kenya Highlands are a White Man's Country and fortifies this view by a short but good exposition of the major geographical and economic handicaps.

On "Science and the African" he has much to say that is both interesting and valuable, the following extracts being typical of the sound advice given in this chapter: "Doubtless the methods of agriculture employed by the Kikuyu could almost certainly be improved in many details, but this could only be done if European methods of research were employed in trying to develop the African method of cultivation, which is a very different thing from trying to substitute European methods of planting for those which have been evolved out of research by trial and error" (page 122); and, with regard to Anthropology: "As an anthropologist I know only too well how easy it is to get what one thinks is a very deep and real knowledge of the customs of a tribe, only to find out later that the depths have not been plumbed at all, and that a very great deal has been held back" (page 129). In this connection the help of the cinema-camera is correctly emphasized. And "... any anthropological study which ... does not take into consideration the problems which are arising out of culture contact (with western culture), is not really worthy of the name" (page 131).

The conditions "bristling with difficulties" under which the natives live and work in Nairobi are well described, but again one misses solutions. Similarly, in the chapter on Education actual conditions are set out with fairness and a good deal of space is devoted to the ticklish question whether the early teaching of English is not preferable to the existing policy of teaching first Ki-Swahili to the many and later English only to the few. On pages 164-5 Dr. Leakey, not without contributing important new view-points, enters debatable ground by taking up the cudgels against the school of highly qualified research workers who have given us such valuable insight into the African's brain capacity. The concluding paragraphs of this chapter testify to the author's thorough grasp of the relations between Black and White, both as they are and as they should be!

When, finally, he turns to the future much of the earlier parts of his argument are marred by theories of recent climatic desiccation which cannot be accepted by many workers in the same field. Dr. Leakey here seems to overlook entirely the difference between decreasing rainfall and decreasing rainfall efficiency; and to draw earthquakes or volcanic activities into an argument against a bright future for Kenya seems a little farfetched. However, he soon returns from his theoretical flight to realities and then becomes most enlightening in his short and accurate review of the economic trends and the human factors which will shape the future. Among the latter the case of the Indian artisans and traders is fairly put and the diagnosis of the future of all three communities as set forth in the last pages appears to the reviewer perfectly sound.

The book cannot only be strongly recommended to all interested in East African affairs but should be read by everyone whose official duties or private work force him to participate in them. However, Shs. 7/6 is too high a price which may well debar the little volume from that wide circulation which it undoubtedly deserves.—C. G.

"*La Campagne du Tanganika*," par le Colonel du Genie G. Moulaert, Vice-Gouverneur General honoraire, ancien commandant des troupes du Tanganika. (L'édition Universelle, S.A., 53 Rue Royale, Bruxelles.)

This book is the record of the part played by a section of the Belgian Colonial Army during 1916-18 in Tanganyika Territory. Few British people realize the importance and weight of Belgian intervention in the campaign of 1914-18 and still less understand the fascination which the region about Lake Tanganyika has for the Belgian national mind. It may be a surprise to some to learn that Belgian troops and Belgian guns penetrated south of Mahenge, and that Belgian hardihood erected a fort at Karema in the Kigoma district in 1879 from which to combat the slave trade of the day.

Colonel Moulaert's book does not describe the engagements fought by Belgian officered Congolese troops throughout the campaign. We still have to wait for a detailed account of those long and hungry marches and of the fine fighting qualities of the "Bula Matadi." (It is curious to remark that these men should be known by Stanley's native name "Bula Matadi," i.e. the breaker of rocks.) The book describes a hard, if a less spectacular, side of the campaign. It describes events which may easily be forgotten but are, nevertheless, after the style of the foundations of an edifice.

In and before 1914 the author was "Commissaire General du District du Moyen-Congo." His headquarters were at Leopoldville (old Leopoldville, not the present place) on Stanley Pool; his numerous duties included the supervision of the large fleet of shallow draft vessels which maintained communications between Stanley Pool and Stanley Falls.

In his introduction Colonel Moulaert is enlightening with regard to the early war days on Stanley Pool and concerning the operations which were conducted as from the Congo side towards Kamerun. He explains that at the outbreak of hostilities the Governor General of the colony declared that the colony was "neutral." To those who remember August 1914 on Stanley Pool this fact will dispel some misconceptions.

Early in 1916 Colonel Moulaert, who is an officer of the Engineer Corps, was appointed to command "Groupe II" of the Belgian forces operating about Tanganyika. He arrived at his headquarters at Kalemie (Albertville) in February, and he describes in some detail the impressions gained in the five weeks' journey from Leopoldville. "Groupe II," as constituted at Albertville, comprised a head-quarter staff, a wireless section, engineers, artillery, a small lake flotilla, and the sixth battalion of the colonial army; other battalions and troops were attached from time to time. The duty of the "Groupe"—it became the "Groupe du Tanganika" later—at first was to maintain a strict watch on affairs on the lake and to set up an impregnable defence of the base at Albertville which was also the naval base. It follows that the "Groupe" was concerned with naval as well as land matters, hence the most interesting chapter of the book, at least to the present reviewer, is the description of the naval actions on Lake Tanganyika as viewed from the standpoint of a Belgian officer. His criticism of British naval enterprise on the lake is frank and thus has value, but it does not follow that it is entirely right.

At the commencement of operations the Germans had a vastly superior naval force. They had armed the *Graf von Gotzen* (now the *Liamba*), the *Hedwig von Wissmann* and two smaller vessels, the *Kingali* (later renamed the *Fifi*) and the *Wami* (now the *Wapi*). There was but one small Belgian steamer on the lake, the *Alexandre del Commune*, and she had been sunk at Toa. The only British vessel, I believe, was the *Goodnews* (not the *Cecil Rhodes* as Colonel Moulaert writes), a large steam launch which was destroyed on the slips at Kituta in Northern Rhodesia. The *Delcommune* was salvaged, armed and renamed

the *Vengeur*, and in December 1915, with the arrival of Commander Spicer Simpson, R.N., with his two swift Thornycroft motor launches, the *Mimi* and *Tutu*, together with the extremely fast despatch boat *Netta* transported from the Congo—a striking force was created. By the combined forces the *Kingali* was captured and the *Wissmann* sunk. The *Gotzen* was eventually scuttled by its crew when Kigoma was evacuated (29th July, 1916), and the *Wami* was sunk by the *Netta*. It is not a point of much importance but I think Colonel Moulaert is mistaken when he mentions the proposal to transport Messrs. Lever Brothers' shallow draft steamer, the *Comte de Flandre*, to the lake. Actually the *St. George*, a triple screw shallow draft motor boat built for the British consular service, and in commission on the Congo river, was dismantled at Stanley Pool and re-erected at Albertville. The *St. George* became the flagship of the British naval force which took over Kasanga as its base when it left Albertville somewhere about July 1916. The vessel can be seen on the stocks in the aerial photograph of Albertville, or Kalemie, which is included in the book.

When Colonel Moulaert arrived at Albertville it was a mere windswept camp, mostly of *bandas*, at the head of a long line of communications. A newly-constructed railway linked the place to Kabalo on the Lualaba, and thence by river steamer to the north, by more railways, via Stanleyville, the Congo, and the Colonel's old river steamers to Stanley Pool. There were also communications to the south from Kabalo.

Among the tasks of "Groupe II" was the fortification of Albertville, the creation of a harbour by constructing a sea wall (how the lake seas rolled over that wall) and to build ships—the *Baron Dhanis*, known to all lake dwellers, was erected at Albertville in 1916—and all seemingly out of little or nothing. Albertville was an extremely precarious perch in those early days and how well it was improved and extended can be gleaned from this book. A constant steamer service was latterly maintained with the eastern shore, and it is no wonder that Colonel Moulaert dedicates his work to "My dear comrades in the troops of Tanganyika . . ." for everybody seemed to make bricks without straw.

Later Colonel Moulaert's headquarters were moved to Kigoma, but before this seaplanes arrived from Europe and were based on Toa, north of Albertville. Flights were made over Kigoma and some bombing took place. There are two fine photographs of Kigoma from the air included in the book, both were taken before the town was evacuated. In one the German steamer *Adjutant* can be seen as she is burning on the slipway and the *Adjutant* has a history of her own. In the other the fortifications on Bangwe are clearly shown—they are buried deep in bush to-day. Indeed, all the photographs are both particularly good and interesting and from them much can be learned of the difficulties which confronted the Belgian forces. After Kigoma was evacuated—because of the Belgian threat to communications with Tabora—and the "Brigade Sud" under Colonel Olsen commenced their advance towards Tabora, a locomotive was brought across the lake. How it was done is the marines' own secret; it was followed by others. The state of the railway on which these "machines" had to operate can be seen in the photographs of the bridges over the Ruchugi at Uvinza station, over the Malagarasi and other rivers.

Colonel Moulaert includes a section on the operations of the sixth battalion which passed through the south of Kigoma and north Ufipa district to Tabora. The author also expresses his views with considerable energy concerning events after the capture of Tabora when the Belgian forces were withdrawn westwards. Doubtless he has the right to express them as he feels what most Belgians did and probably do. With that observation the matter can rest. The only criticism that I could make against the book is its title, which is somewhat misleading. We ought to hear much more about the "Brigade Nord" and "Brigade Sud" and the operations of General Tombeur before we can talk about "La Campagne."—F. L.

"*The History and Coinage of the Sultans of Kilwa*," by John Walker (*The Numismatic Chronicle*," Fifth Series, vol. XVI, 1935-36.)

Those not interested primarily in numismatics might be forgiven for glancing at this article and throwing it aside in the first instance but on taking it up again it would be found to contain matter of interest and would not so easily be set aside a second time.

It is, however, disappointing from the dilettante's point of view, which is unfortunately my own, that the knowledge gleaned from the hoards of coins examined by the expert are not correlated to the better known facts of the history of Kilwa.

It is not possible to review the article in the accepted term as it is a catalogue of indisputable statements of fact and history. As, however, the author hopes to publish an English translation of the Arabic Chronicle of Kilwa, which will be awaited with interest, it may not be out of place to suggest that a narrative compiled from the notes of Yakut and ibn Batuta (such as they are) the Portuguese records and the Chronicle would be eagerly absorbed, particularly so were it possible to reconstruct on paper the ruined mosques and other buildings at Kilwa in a manner similar to that which has familiarized the temples of southern Mesopotamia at Ur.

Who, reading of the murder of the Sultan Sulaiman ibn al Hassan the Accursed, would not wish to know the reason for his execration and the measures for revenge taken by his son Hassan from the people of Mafia? It may well be that legends are still repeated in Kilwa and Mafia which elucidate the murder and subsequent revenge.—T. M. R.

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This article of thirty-nine pages with two plates of Kilwa coinage is the work of one who is not only a numismatic specialist but also an excellent Arabic scholar.

The article gives a short summary of the existing hoards of Kilwa coins and of the two sources from which our knowledge of the history of Kilwa is derived, namely the Portuguese account by the historian de Barros, and the Arabic manuscript of the Kilwa Chronicle, which was presented to the British Museum in 1883 by Sir John Kirk. Then follows a comparison of the names of the Kilwa rulers as contained in the two sources mentioned above. The author gives their names and also short important notes concerning their rule. Then he constructs, on the basis of this comparison, a genealogy of the Sultans of Kilwa, basing his conclusions on the study of the Kilwa coins: first of the house of the founder of this state, which he calls the House of Ali, then of the house of the tyrant Sulaiman and lastly of the house of the Amirs Sulaiman and Muhammad. This genealogy is constructed in a clear and convincing manner and is the essence of the entire article. It throws light on this otherwise obscure dynasty.

Judging by the footnotes the author is acquainted not only with the English literature on this subject but also with the German, Italian, French and Portuguese writers who have dealt with it; and he has obviously made a careful study of the works of the Arabic geographers and travellers.

Apart from the interest which this article possesses for a numismatic student it will be of great value to students of East African history; and any one wishing to undertake a history of the Sultanate of Kilwa will find in it a fund of valuable information.—R. R.

CORRESPONDENCE

Editor, Tanganyika Notes and Records.

Dear Sir,—It was with great interest that I read the first number of your journal and I shall look forward to future copies.

There is one article in which I am particularly interested and that is "Native Materia Medica" about which there must be a great deal to learn.

The particular article deals with arrow poisons and I should like to know if the writer has come across a tree which is common in parts of Kenya and from which natives, especially the Giriama, make a very virulent poison. The tree is *Acokanthera schimperi* (Kikuyu *Muricho*; Masai *Murijo*), and obviously a variety of those found in Tanganyika Territory.

The Giriama produce large quantities of the poison which they get by boiling the roots of the trees and produce a dark coloured glutinous substance which they shape into sticks, about the size of a pencil, and wrap in dried leaf. There is a considerable illicit, but profitable, trade with the Akamba and Wa-Sanye and other hunting and poaching tribes.

So far as I know this poison must be fresh to be effective, but it must be very strong as only a few arrows will kill an elephant, and smaller game succumb quickly.

I write as a layman and I am not sure how much is known about the poison but it cannot be much as during a recent murder case medical evidence was uncertain of its effect and though there was strong presumption that the arrow had been coated with the poison it could not be proved.

My own idea that the poison must be fresh was gained during the Giriama rising in 1914 when I particularly noticed two casualties among the King's African Rifles. One man was hit by an arrow just below the heart, the barb was extracted and the man recovered. Another askari had a flesh wound in the thigh from an arrow and died in about three minutes.

It is a fact that the natives are very careful about wrapping the poison so that it does not get dry too quickly.

It is curious that elephants are particularly fond of the red berries of this tree from the roots of which poison is made to kill them.—Yours faithfully,
H. R. MONTGOMERY, *Chief Native Commissioner.*

The Secretariat, Nairobi, Kenya.

2nd June, 1936.

Editor, Tanganyika Notes and Records.

Dear Sir,—I have noted with considerable interest the further details concerning the preparation of *Acocanthera* poison recorded by the Chief Native Commissioner of Kenya Colony.

It is understood that the genus *Acocanthera* was revised in 1923 and it is doubtful whether the specific name given by your correspondent still stands. The species of *Acocanthera* occurring in Tanganyika are three. Two were described in the article as used for arrow poison manufacture in Tanganyika and both contain toxic glucosides closely related to, if not identical with, Ouabain.

A report regarding the probable use of the third species in the preparation of *Uchungu* poison has recently been received and the notes attached, prepared by the Assistant District Officer, Liwale, Mr. Dowsett, will probably interest your readers. The botanist of the East African Agricultural Research Station reports on botanical specimens collected at Liwale as follows:—

"*Uchungu* is an *Acocanthera* probably *A. veneata* (Thbg.) G. Don *Kikulo* is a species of *Fadogia*. In a recent monograph there is a passing reference to the use of *F. djalonensis* Cheval, in Nigeria as an antidote to arrow poison."

Regarding the question of the deterioration of arrow poisons, to be effective they must be absorbed rapidly into the blood stream so that it would be an advantage if the poison was moist. It is probable that older specimens of poison are less effective, due to their tendency to dry and become insoluble rather than to any actual chemical deterioration.

Reference may be made to the tentative methods worked out for the examination and classification of arrow poisons published elsewhere ("Analyst" 61 (1936), 100-3) regarding the chemico-legal aspects of arrow poisoning.

The non-toxic nature of the berries is a matter of considerable interest. According to Steyn ("Toxicology of Plants in South Africa," page 326), "Mettam (1929) states that the fruit of *Acocanthera schimperi* Scheveinpel and *A. longiflora* Stuhl. is edible and is used in the making of jam."

It is hoped it will be possible to carry out further laboratory work on some of the problems that still remain in the consideration of East African arrow poisons. I should welcome any information that your readers may have on this subject.—Yours faithfully, W. D. RAYMOND, *Government Analyst*.

Medical Laboratory, Dar es Salaam.

1st August, 1936.

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THE POISON *Uchungu*.

This poison is obtained from what is believed to be the tree *Acocanthera* sp. (native name *Uchungu*), which grows in one locality on the northern side of the watershed variously named Libungani and Mpapule in Liwale district (map ref. G.F.F. F.6.A. 6.7. 10 and 11). The trees are very dense in one or two areas, and it might be considered that the present distribution is due to the seeding of one or a few trees introduced at that spot many years ago. No information can now be obtained as to who introduced it and from whence it came. This locality is, however, the only one known in the Southern province.

The tree itself is unmistakable. The average size is some thirty to forty feet tall, with a circumference three feet from the ground of thirty to thirty-two feet. The bark appears of a greyish colour. The leaves are some four to five inches long by two inches broad and lancet shaped. They are, when on the tree, of a bright, glossy emerald green colour. The general effect from a distance is dark. The trees are perennial. There is no apparent malefluence on surrounding vegetation.

The poison is obtained by the following process. A section of a tree is cut and divided into slivers. These are then placed in a pot together with a certain amount of water and boiled until a black, sticky mass is produced, which can be stored, and which is smeared on the arrow head. The strength of the poison depends upon the quantity of water added to a given quantity of the slivers. It is, as may be deduced from the name, of an exceedingly bitter flavour.

The poison is well known among the natives of the southern area, many of whom come from surrounding districts in order to purchase it. It is also peddled by the makers in other districts at a price of some two shillings for a small phial.

The strength will remain unimpaired up to two or three years if kept from sun and rain. The manufacture is not secret, and is performed by as many as six or more different families living in the areas.

A concoction of average strength will kill a normal man in from half to an hour after being struck. It depends for its success on its being introduced into the blood by a wound. Thus it may be handled and even drunk with—if there are no sores or open wounds—no more effect than inducing an attack of dysentery. The elephant is considered immune, though this may follow from the difficulty experienced in penetrating its hide.

The antidote used for the *Uchungu* poison is the juice of the root of a plant, named in Swahili *Kikulo*.

The method of administering this antidote is to crush the root and rub it and the juice on and into the open wound. The effect is apparently to neutralize the poison in the blood. It is considered by natives to be effective, even if administration is delayed for a period. *Kikulo* is a bush with leaves lighter than but of somewhat similar shape to *Uchungu*. It is found near at hand to the poison tree, but its habitat is not so circumscribed.

