

TANGANYIKA NOTES AND RECORDS

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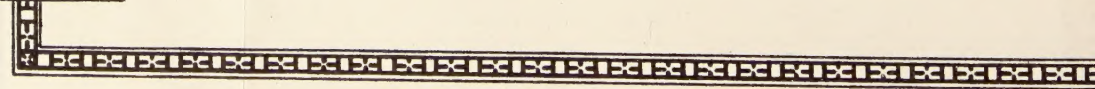
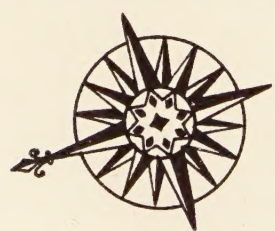
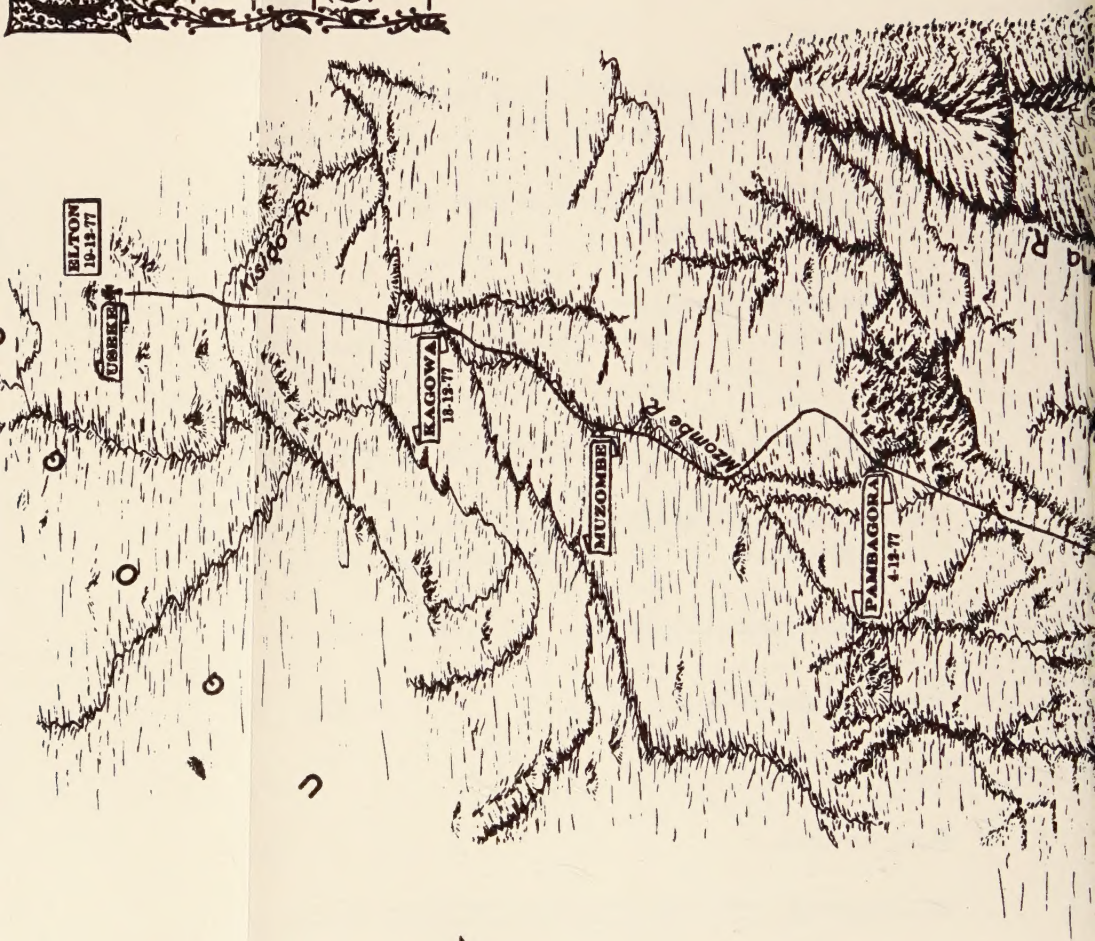
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Lop of the route followed
by Consul Elton in
his journey through
Tanganyika from Lake
Nyasa to Useke ~





Editorial Notes

THIS number of *Tanganyika Notes and Records* will appear without illustrations. I hope that the next number will be illustrated as usual and that readers will continue to give our paper all the support they can.

* * * *

This number also breaks fresh ground for two reasons. Firstly, it contains the first *Notes and Records* contribution from an African written by himself in English. We cannot, it is true, claim Sheikh Abdurahman as a native of Tanganyika but I hope his interesting paper will persuade some African of this Territory to send in an article for publication. Secondly, this issue contains two articles, of which Sheikh Abdurahman's is one, which deal with Zanzibar and not Tanganyika. This is an innovation which I wish to repeat, since there are many matters of common interest to all the East African territories and contributions from readers all over East Africa which, though primarily dealing with their own territory, yet are of direct concern to Tanganyika should certainly be suitable for *Notes and Records*.

* * * *

The first article in this number, a translation dealing with the medical side of the 1914-1918 war in this Territory from the German point of view will, perhaps, prompt some older readers who fought in the East African campaign to send in articles or old letters of the period which they may still have. There is no doubt that there is a lot of interesting information about the campaign still to be had in this country and it should be one of the functions of *Notes and Records* to see that it is preserved.

* * * *

We acknowledge with thanks the receipt of the following periodicals:—*Journal of the African Society, United Empire, Man, Bantu Studies, Soviet Sub-Tropics, Uganda Journal, Journal of the East Africa and Uganda Natural History Society, Journal of the Entomological Society of Southern Africa, Sudan Notes and Records*, and publications of the Musée du Congo Belge, the Société des Africanistes, and the Institut Français d'Afrique Noire.

* * * *

Notices appear elsewhere in this issue of a paper on African metallurgy by Mr A. E. Robinson, who has already contributed several articles to *Notes and Records*, and of the first two papers published by the Rhodes-Livingstone Institute. We have also received two papers from Professor Dr G. Lindblom, of the Ethnographical Museum, Stockholm. The first is on "Wire-Drawing, especially in Africa" and gives examples of the practice among various

Tanganyika tribes, including the Wanyamwezi, the peoples of Karagwe, the Makonde and the Wakinga. The author has no knowledge regarding the existence of wire-drawing in eastern Tanganyika and further information on this subject from readers would be of interest. Professor Lindblom does not consider the evidence at his disposal justifies definite conclusions regarding the age of wire-drawing in Africa or elsewhere, but is inclined to think Africa received the art from Arabia or India.

In the second paper, reprinted from the journal *Ethnos*, Professor Lindblom deals with African harpoon arrows. The only two areas where he knows of this type of arrow are in the areas inhabited by the Wasandawi and Wakindiga in Tanganyika Territory and the Congo Basin. The arrows are tipped either with wood or iron and the author quotes the mention of the wooden-tipped type for hunting rock rabbits by Mr F. J. Bagshawe, the former Provincial Commissioner, in his paper "The Peoples of the Happy Valley," *Journal of the African Society*, 1925, page 226. Professor Lindblom considers that it is tempting to believe that the harpoon arrow once formed part of a primitive hunter stage (*Urkultur*) but would welcome additional information to his material on this curious arrow type.

A German Account of the Medical Side of the War in East Africa, 1914-1918

By the late Staff-Surgeon Dr M. Taute

*(A lecture given on the 14th July 1919 to the Society of Natural
Science and Medicine at Tübingen.)*

EDITOR'S NOTE.—The original paper was published in the *Archiv. f. Schiffs-und Tropen-Hygiene* 1919, Nov., Vol. 23, No. 22, pp. 523-554. The publication of this translation was authorized in July 1939 by the publisher, to whom acknowledgment is gratefully made.

The word "sanitation" (*Sanität*) should often be read as "medical."

GENTLEMEN—Before I seek to describe to you something of the medical work in the East African field of war, I must glance quite briefly on the map over the war area and the important events. As you see, the Protected Territory was surrounded by British, Belgian and Portuguese colonies and the sea also was soon quite closed to us by the English. Immediately after the beginning of hostilities von Lettow-Vorbeck, then Chief Lieutenant (*Oberstleutnant*), collected his main forces in the north of the colony.

1914 At the battle of Tanga, against at least a ten-fold superior force of English and Indians, and the fight at Longido and Jassini, the first great onrush was beaten off and it became clear to the enemy that, in order to attain anything noteworthy against us, much more powerful armament would be needed. The Belgians, fighting in the area of Lakes Tanganyika and Kivu, and the English troops operating on Lake Victoria were also repulsed by our detachments there. The now increasing preparations of the enemy lasted during the whole
1915 year 1915. This was used by us to improve our preparedness and at the same time to inflict damage on the enemy wherever possible. Numerous scattered patrols against the Uganda railway and special undertakings of smaller detachments dealt with that business with the greatest success.

1916 With the beginning of 1916, the new great offensive, commanded by General Smuts, began in the region of Kilimanjaro and, on the other boundaries, our various enemies, with increased and well equipped masses of troops, began to move energetically. Not reckoning the Portuguese and Belgians, England had brought into the field against us East Africans, according to the statement later of an English general, from two hundred and seventy to three hundred thousand men—English, South Africans, Rhodesians, The King's African Rifles, Gold Coast negroes, Nigerian troops and Jamaicans, Cape boys and people of Beluchistan, Bengal, Kashmir and Punjab. On the other hand we had at our disposal all in all some three thousand Germans and perhaps thirteen thousand coloured soldiers, of whom, however, quite a large

part never came into question as fighting troops but were only used for depot service (*Etappendienst*).

It is clear that in these circumstances we could not hold the colony for long. However, in spite of this we succeeded, after the fights, with great losses, at Reata and Kahe in March 1916, in defending German ground up to the end of November 1917. I cannot here relate in detail the almost uninterrupted bloody events of war during this period. Especially severe were the fights in August and September 1916 at Morogoro and in the Uluguru mountains as well as at Kibata at the end of the same year.

1917 At the beginning of 1917, after General Smuts had been replaced by General van Deventer, the enemy again increased his armaments in order to give the supposed last blow. Among the ensuing severe fights are specially worthy of mention those of Narungombe and above all at Mahiwa from the 15th to the 18th October 1917 where about two thousand German troops successfully withstood an at least ten-fold superior English force. Our ammunition was nearly finished; we shot with black powder and this was quickly finished. In November 1917 at the foot of the Makonde plateau the resolve had to be taken to reduce considerably the number of our associated troops and then with the remaining nucleus of troops to seek Portuguese territory.

Tafel Our western portion under Captain Tafel had meanwhile fought in the district of Mahenge and had marched then in the direction of the Rovuma where they could no longer join with us but, hunger pressing, had to surrender to the English. A smaller detachment, under Captain Wintgens, had fought for a long time to the northward and inflicted important damage on the enemy who had finally again crossed the Usambara railway.

Last phase With the crossing of the boundary river Rovuma at Ngomano on the 25th November 1917 the last phase of the war began. The huge territory of Portuguese East Africa was now our field, where we, through incessant undertakings, notably damaged the English and Portuguese opponents; and always at the right time provided ourselves with what we needed, even, most important, ammunition and quinine.

We see on the map our intricate path which once led to the neighbourhood of the Zambezi. The severe fights at Kirekaberg, Tibaniberg, Namakurra, Namirruue, Numarroee, Lioma and Huluaberg form the most important war events in this period. On the 28th September 1918 we crossed the Rovuma for the second time and were again in German territory. The English, with the Belgians, now waited for us on the main railway between Kigoma and Dar es Salaam when the last catastrophe was again prepared for us. General von Lettow did not go there but we turned, after we had marched northwards above Nyassa, to the west and were soon in Northern Rhodesia. There, on the 13th November 1918, the news of the armistice reached us. It is no exaggeration if I assert that we could have maintained our resistance throughout the year 1919.

The health service To report on the health service in this campaign now presents some difficulties as records and other written material are almost entirely wanting.

Our statistical and especially scientific records are to be regarded almost without exception as finally lost. On account of the great dearth of paper there was also in the latter part of the war a great decrease in writing. Case sheets could no longer be made for some time. Little papers of the smallest dimensions and of the most varied origin served in their place for important records.

My observations that now follow are based chiefly on the general view and the experience which I could gain from the beginning of the war onwards as field medical officer, and later as a health officer on the staff of the commands of the territorial troops. When we, as soon occurred, collected all the doctors present in the territory we had sixty-three doctors at our disposal. This relatively high number is explained by the fortunate circumstances that all doctors who had been ordered for the sleeping sickness campaign could be released for the troops and, further, the mission doctors, railway doctors and also the ships' surgeons of the East African line were collected. Five veterinary surgeons found service later as assistants in the medical service and in microscopical work in the field hospitals. The sanitary non-commissioned officers were generally few in number. The foundation of sanitation schools partly helped. The Red Cross sisters of the colony were taken over by the Field and Base hospitals and were added to by numerous assistant sisters. Of the coloured personnel there were three to four health orderlies for the several companies and besides these several well-trained sanitation boys were employed in the hospitals.

The vicissitudes of the war soon tore important gaps in the ranks of our health personnel. Staff-surgeons Dr Schumacher, Dr Mohm, Dr Fickert, the bacteriologist of the field hospital, Assistant Veterinary Officer Dr Woelffel and numerous sanitation non-commissioned officers were killed. Staff-surgeon Dr Neubert was killed by an elephant. There were also killed in the war Staff-surgeons Dr Bartels and Dr Goettsche, the assistant ship's surgeon Dr Oehme and many persons of the assistant sanitary personnel. In Portuguese territory of the sixty-three doctors we still had at first thirteen and later only six in service. Of these six two were so reduced in health that sooner or later they had to be sent back.

As for the general health conditions the climate of the seat of war, on account of its position just south of the equator, is purely tropical. In the dry season the lack of water was often complete yet it rarely led to difficulties. Their occurrence among the scattered railway patrols, who in one case drunk their own urine and used the blood of birds to quench thirst, belongs to the exceptions. On the other hand the wet season gave us much more to do medically. The big rains of 1916 and 1917 were unusually heavy (*ausgiebig*) even for tropical conditions. The marches in those times resembled water pantomimes and were so named; unfortunately people were drowned. The river region of the Rufiji, where in the memory of man no such flooding had occurred, had become in February and March 1917 a gigantic sheet of water. Our camping places in that region were often seriously endangered and our patrols had often to seek shelter in trees. In such circumstances it was difficult

to live even moderately hygienically and as a rule the English used as far as possible only their coloured troops for actual warfare from the beginning of the heavy rains to the beginning of the dry season.

Clothing At the beginning of the war our clothing was good and suitable. On the establishment of new formations, however, our stocks of cloth and clothes were quickly finished. That was at first noticeable in our askaris for the thin khaki cloth had no great durability, so that in a short time it was so torn that it could no longer be mended and many companies appeared to be naked. Soon the whites became no better, especially as regards the need of boots. At first, indeed, we tanned leather and made shoes, but these were neither many nor durable. The lack of stockings was often unpleasant, hence it happened that here and there Europeans also appeared in the bush barefoot. Later, in Portuguese territory, it was better, for the larger game generally sufficed to clothe our diminished number of troops tolerably well. That of course was not much. Helmets, shirts, short trousers not reaching to the knee, stockings, boots, putties were all that the European had on his body. The much abused short trouser was incomparably convenient and suitable to wear but, unfortunately, somewhat unhygienic. The bare knees paid toll to the malaria-carrying mosquito bites and to the entrance of ancylostome larvae on the marches through wet grass. In this respect, an English pattern of short trousers in which the lower edge could be folded above the knee according to need and then came to lie under the puttee was freer from objection.

Blankets and tents For a long time the lack of blankets was troublesome especially for our hospitals. We had soon to dispense with the very fine tropical tents which we used to carry on our journeys in peace time, in order to decrease the army of porters and not cripple our mobility. Two small strips of tent from home replaced the tropical tents and fulfilled their purpose completely so long as they remained thick. Our coloured soldiers had only one, very often none. Repeatedly the strips of tent of whole companies were totally lost. He who knows the tropical rainy season knows what such loss meant in health to the troops.

Beds A grass bed with blankets served for the Europeans. The carrying of other bedding or of field beds had made too much luggage. Even the hospitals could no longer carry beds with them after 1917. At times there was a lack of mosquito nets, yet during the whole war each European usually slept under a mosquito net when not on patrol or fighting, which gave protection not only against mosquitoes but also against rats, snakes and other vermin.

Food The food was good and sufficient from the beginning of the war to 1916. Later the Europeans, as regards this, had to adopt the mode of living of the negro and this finally succeeded. This was so obvious after a time that one no longer got the impression of anything special or noteworthy and we first learned to be surprised again when we returned to the homeland. A quite palatable bread was often made from a mixture of the different kinds of cereals of the natives but of course did not usually equal the German war bread. A kind of gruel called "*uji*" played a large part in the food. It was acceptable

but very monotonous after a long time. The tubers of manioc (*muhogo*), sweet potatoes and, as a special delicacy, yam, provided us with a very good substitute for the European potato. As regards legumes different sorts of peas and beans were planted in the country and were always very palatable. The meat supply of the troops was many times almost superabundant, on the other hand often scanty. The tsetse regions where all cattle die of *nagana* were mostly good hunting country so we could provide ourselves with meat by shooting game if only we had reasonable time, which unfortunately was often not the case. The lack of fat for a long time was often very trying. Groundnuts, sesame and coconut oil were often quite finished. Coconut oil had a stinging rancid taste which could never be quite overcome. On the other hand the fat of hippopotamus and still more so of elephants was very palatable. Both were reckoned as most desirable requirements of the troops. At first by pressing and cooking the juice of the sugar cane, sugar was good and plentiful. Later in Portuguese territory this was no longer the case and there a complete lack of sugar lasting for a month was severely felt. There, fortunately, a little wild honey was used when it could be obtained. Our stocks of salt were frequently reduced to dregs and our coloured troops suffered much from this shortage. The search for a substitute by incinerating certain kinds of grass yielded only moderately small quantities of a salt rich in potash and therefore of little use. Red pepper was planted by the natives and was useful enough. Various plants that could be used as a sort of spinach grew wild in the bush. The leaves of manioc also served as useful green vegetables. In season all possible forms of mushrooms formed quite a good vegetable even if their palatability was far below that of the home-grown kind. As regards fruits such as bananas, mangoes, pineapple, "anonen," guavas and oranges there was hardly any lack during the first year of the war in harvest time; later, as substitutes, wild little tree fruits were gathered in the bush. After our preferable German East African plantation coffee was finished, we prepared coffee by roasting grains of *mtama* or maize. As a tea substitute leaves of various plants were used. Up to the year 1916 alcoholic drinks were prepared in the colony to a moderate extent from corn and sugar cane in improvised breweries. Later, as food became scarcer, this was obviously omitted. The lack of alcohol was on the whole an advantage to the troops but it must be admitted that many times after great strain or in rain in cold mountains, there was a great desire for a small analepticum. So, to the unwilling surprise of our opponents and often even to our own surprise, we succeeded in balancing to some extent the lack of supplies by the use of all means of livelihood in the country. This was an advantage to us as we marched during the war always to new food areas, whilst the enemy was ever further parted from his food base and so finally had a quite complicated line.

Admittedly we had often more than lean times, as, for example, in the first months of 1917 when the daily food ration, already reduced from one kilogram to seven hundred and fifty grammes of flour for the coloured troops and still further reduced to six hundred grammes of flour or four hundred grammes

of rice, must be set aside as the only food. Any askari who had a boy or wife must feed these also with this. At that time there was often no flour and then unripe maize cobs formed a still less sufficient ration. The first few weeks after crossing the Rovuma at the end of 1917 were also lean ones, where in the unknown country anxiety always hung over us whether we would have anything to eat for our six thousand souls for the next few days. Wild roots, plants, grasses, tree fruits, wild-growing itch beans, in short all that could be removed to serve as food was gathered. Our delivery from want, however, was the numerous hippopotami met with in the Lugenda river whose flesh even the Mohammedans had eventually to eat in spite of the great ritualistic considerations. We again had good times later in the area of Ubena-Langenburg where the herds of cattle provided us with meat and where both sick and well could be given milk. Up to 1917 we supplied food to the hospitals from the hospital kitchens. When this could no longer be done each sick person's food was cooked by his own boy and hospital feeding was only requisitioned for those severely ill and for intestinal affections.

The marches were very exhausting especially in the last period when there was often marching for successive weeks without a day's rest, all the more so as the pauses during the march had to be used to prepare food. On an average, even in a pathless country, about twenty-five kilometres per day were traversed, many a time much more. After 1917 there were no more riding animals for the officers. If we captured horses or mules they died regularly within a few weeks from *nagana*. Especially fatiguing were the series of unavoidable camps on the usual caravan march. On the Rovuma our whole caravan, consisting of only fourteen companies and two batteries with the baggage, was about thirty kilometres long and had to be marched day and night in order to keep this army worm moving together. Frequently the porters slept with their sixty-pound loads on their heads. In 1918 we changed and marched in from three to six tracks about twenty yards apart squarely through the bush. In spite of the lack of paths this procedure had the advantage that our people reached the rest-camp fairly well together and were less tired. As in our caravan, there marched also besides the fighting troops many porters, women, children, European's boys, and askaris' boys our march presented a very variegated picture. Children were born on the way, went along with the others and grew. The rest days were used to grind the harvested corn into flour and each native carried his food—often for as many as fifteen days, whereby the troops gained a great mobility.

In camp buildings a huge routine soon developed. The bases of the first year of war, where tents were replaced by grass huts, were partly quite habitable and were very suitable for rest for the troops as, for example, the big camp Madalla in the mountains of Usambara. Instead of large shelters I always arranged to put native bodies of men in single small huts; transmission of sickness was so much more easily avoided and spread of an epidemic more controllable. Also the askari himself prefers the small grass hut to all others. Apart from this we naturally maintained as far as possible those hygienic

measures proved at home and which in general could quite well be carried out. The water supply of Europeans and natives could almost always be well separated. The askaris always drank raw water; attempts to supply them with boiled water during times of typhoid fever led to no practical result—actually the askari still drank what he wished. On the other hand so long as we still fought on German ground, our Europeans, almost without exception, only drank boiled water. Later, in Portuguese territory where we had little rest, this was no longer the case almost throughout. This caused no epidemic, though, of course, I do not wish to say that I regard drinking raw water generally or in the tropics as harmless.

latrines Simple latrine trenches, separate for askaris and porters always proved efficient. In stationary hospitals or at bases so-called smoke latrines were made after the experience of the Kamerun railway doctor, Dr Peters, which are indicated for primitive tropical conditions provided that smoke will develop well in the passages, and in the Kamerun, as I hear, were already in use in many large works. In many ways the war has greatly educated our natives. One of the gloomiest features of tropical hygiene has been the disposal of the dejecta of natives. The proximity of a native village has often become noticed first by the smell. Superstition played a great part in this state of affairs and well-constructed caravan halts were often only avoided on this account, though clean latrine places were built there for general use. During the earlier time of the war I remember a camp where our good Wanyamwesi deposited their individual dejections in the middle of the camp and then covered them with clay cooking utensils as required. That naturally had to be changed and was changed. For how long after the war the improvement will be maintained is, of course, a question.

Though the constant wandering was very tiring for the troops it had the high protective advantage of frequent change of camp from the standpoint of prevention of epidemics. Old camps, even when they were still in good condition, were not again stayed at.

spitals During the first time of the war our hospitals were stationary and were quite well built under the circumstances; mission buildings and other solid erections were made ready and usually enlarged by barracks. In 1916 this was gradually changed; the hospitals had to be more mobile for they could hardly work for more than three months in the one place. In this second period of the war in which we still had ten field hospitals, two base hospitals and two convalescent places, only rarely were rooms ready available and then the building of hospital places, which were grass huts, was always the first and most pressing task on arrival at a new stopping place. However, after crossing the Rovuma even primitive buildings were only exceptional for hospitals, for the hospitals, like the troops, were almost continually on the march and hardly came to rest. Then simple tents were pitched for the European sick and personnel as well as for operations and for natives a protection from sun, wind or rain was improvised from mud and grass. That was the whole convenience that the three field hospitals which we had taken with us into

Portuguese territory could offer. In order to be hidden from enemy surprises and attacks of aviators we made our hospitals as much as possible in the bush and somewhat apart from the roads. On the other hand that had the great disadvantage that they were often difficult to find by our own people, for in the African bush whole companies can march past one another at a very short distance. The field hospitals had repeatedly the disturbing visits of elephants. It may be imagined that the work of the hospital staff, whose special daily work, after many hours' march, first began after the establishment of the hospital, was very tiring. It often lasted into the night and was carried out then by candle light, or in lucky cases in the light of a stable lantern. From the middle of July 1918 we had to be satisfied with two field hospitals, owing to the lack of medical personnel. One of these, at Lioma, was almost entirely lost during an English surprise on the 31st August 1918. In the kind of war of the last year it was no longer possible to secure sufficient military sanitary service, so our wounded and sick often spent very agitated hours. In the month of August 1918, for example, our field hospital, on the first day of the fight, was at Kirekaberg the special point of attack of the opponent. Usually only such sick were received into the hospital as needed special care and treatment or were unable to move for a long time; all other patients, especially malaria cases, were usually treated in the ranks. The individual doctors were distributed to companies or detachments yet, in time, it became practical for the same doctor, in order to be always mobile and useful, to form a group for himself and he carried the necessary medical equipment with him. Above all a microscope was necessary without which a doctor in the tropics is more or less helpless, also a case of surgical instruments. Each doctor, after deducting his personal luggage, two personal boys and a sanitary boy, had for his work a special staff of six natives. This number was found by many to be too little, still it generally sufficed, for we scarcely possessed any longer the medical works of reference and special scientific literature which we would have gladly carried with us. The mobility of the individual doctors greatly increased by this plan, and their greater freedom from the difficulty of shortage and change of porters proved to be very good and suitable for such conditions.

In the year 1916, as in the home sanitation companies, we had formed some chief dressing stations which marched with the troops and worked in the fighting. Later, these chief dressing stations expanded into field hospitals and chief dressing stations were established quite by themselves when fighting occurred by the coming together of several doctors with their personnel and equipment. There is nothing to say about the purely medical work of the dressing station that is different from similar work in Europe. Lack of light at night was a bad thing and often bandaging was done by firelight. The greatest anxiety was always the further transport of the wounded. This went quite well in the first period of the war when we could still work in greater peace, and had a sufficient number of porters for the sick and some automobiles as well as the Usambara and main railway at our disposal. A fine hospital train was arranged on the main railway. Later, when such aids failed and we

microscopes

Transport
wounded

performed our duties mostly on the move, the transport for wounded as well as for doctors was bad. During the big rainy season of 1917 I led such transport from Rufiji for eight days across the bush to Madaba. I used about eight hundred porters for the loads, hammocks and provisions and all that had to march in single file. In Portuguese territory these conditions were still worse. An example may be given. After the storming of Ngomano on the 25th November 1917 we carried the wounded, many with severe gunshot fractures and one with an amputation of the thigh on the journey, for twenty-eight days in hammocks, on troublesome paths and over difficult river crossings until, on the 22nd December 1917, they obtained a few weeks' rest in Chirumba. Under such circumstances it was necessary—quite apart from purely practical reasons—to leave behind the men who fell sick from time to time and whose recovery to a capacity for service was no longer expected, in the care of doctors or sanitary non-commissioned officers in order that they could then be taken over by enemy hospitals. Even this way out became later on a more difficult resolve, for leaving behind the sick in the middle of the bush was always a risk and we could with difficulty release from our rapidly diminishing health personnel any for the care of those left behind without endangering the onward marching troops.

Medical
stores

If, indeed, the health establishment of the colony was not prepared for war yet a real shortage of sanitary material did not appear immediately for, shortly before the outbreak of war, a large timely supply of medicines from home had arrived and, on account of the railway construction, quite an important amount of medicines and bandages were in the colony. The voluntary assistance of the women of East Africa, organized and led by Frau Gouverneur Schnee, had rendered very valuable service by preparing the necessary materials for the care of the sick. The result was that at first only such things were short as were intended for special war aims. Our whole stock of home-made bandages for example had already been sent out in the first days of October 1914 before it had come to big fighting. A substitute for this was soon established. In other respects also the sanitary equipment of the companies was in no way cut down and it lasted for some time until the several places for sanitary service for the needs of the war had been established as well as our means permitted. Meanwhile, at first, the sanitary service could be taken in hand without important shrinkage of materials.

Quinine

However, when it was shown that a quickly ending war was no more to be reckoned with, one of our most important anxieties quickly approached, namely the supply of quinine for the troops. The carrying through of a tropical war depends indeed in the first place on the question of quinine, for there is no substitute. It was therefore of great value that in the Usambara mountains some planters had occupied themselves with planting cinchona trees and could supply us with cinchona bark. By order of the Government the bark of the biological institute at Amani and by the help of staff chemist Dr Schulze in Mpwapwa and Kilosa was used for the preparation of quinine which was

hardly inferior in action to that prepared in Europe. Though the first of current needs could be supplied and we could preserve a certain stock owing to the arrival of two hundred kilogrammes from the hospital ship *Maria*, yet new difficulties must appear at once when our operations were distant from our places of supply. These were at first met owing to the fact that we took with us as much as possible of our stock of quinine on our journey to the south. This quinine bark had given us very valuable service even when it could not be converted into pure sulphate of quinine, as it was given in concentrated form, many times also as coarse powder and so formed a partial substitute for quinine. Eventually, however, neither by the quinine bark that we carried nor by the quinine of the hospital ship were we proof against severe embarrassments and I recall with depression the months of May and June 1918 when we had only four kilograms of quinine for use of the troops. However, we pillaged from the enemy at the right time as much quinine as was absolutely necessary to us.

bandages No less important was the supply of the troops with bandage material. Already in the early part of 1917 the lack of this had become very great and had reached such a stage that we could no longer treat the numerous tropical ulcers of our natives. By my direction bandages and compresses were now made from beaten tree bark which could be sterilized and had a fairly good absorptive power so that they found a widespread use with good results in Europeans and on the battle field. Later, after crossing to Portuguese territory, the fairly plentiful booty of cotton materials placed us in a position to improvise our bandages again in somewhat more convenient fashion. Surgical cotton-wool was made by removing the fat from raw cotton taken from the plants.

Drugs In addition to the preparation of quinine and bandage material I wish here to mention the preparation of *Ol. Ricini* which also served as a substitute for immersion oil, of *Tinct. Uzara*,* *Tinct. Strophanthi* and *Tinct. Erythrophloeii* (*Digitalis* substitute) from East African drugs; also of alcohol for disinfecting purposes from plants and finally of a very good benzine substitute of vegetable origin. Ointment bases were prepared from hippopotamus and elephant fat and from a mixture of wax and groundnut oil.

stores In the early time of the war our sanitary material was supplied from a so-called sanitary reserve at Morogoro and issued partly direct to the troops and partly through the medium of a field sanitary depot. Later, the sanitary reserve was converted into a more mobile formation under the name of Mobile Field Sanitary Depot. This mobile depot was formed from three sources (*Zuege*) which supplied the various detachments with sanitary material. At Mkindu near the Rufiji, one night in 1917, a part of this mobile sanitary depot was surprised by the English, plundered and burnt down. We lost by this incident about a third part of our stock of quinine, a large stock of bandages and the damage also was very severe.

March)

**Uzara*, the root of a plant of the order *Asclepiadaceae*, employed by native medicine men as a remedy for diarrhoea.

Before the crossing of the troops into Portuguese territory the whole of the still existing supplies of our sanitary material was formed into three field sanitary columns which were managed by apothecaries and distributed among different marching detachments. The supply of the troops with medicines and bandages was carried out by them in a very satisfactory manner up to the end of the war.

It would far outrun the scope of an evening's lecture if I now entered yet further into our scientific and practical experiences as regards details of observations of diseases that occurred. But I wish at least to give a short sketch.

Surgery In surgery our troops were well provided with several specialists. The surgical experiences of the war will coincide pretty well with those in Europe and vanish under the huge material of other seats of war. Special observations and results will yet be published I believe especially by our surgeons. I wish here only to mention that tetanus played only a very small part with us in spite of the fact that we also had a very abundant amount of lacerated and dirty wounds from shells, shrapnel, flying bombs, hand grenades and "minenwerfer" bombs. So we could eliminate prophylactic injections of tetanus serum without danger. In West Africa the conditions appear to be different generally, for there, in some districts, according to Manson, inhabited ground may be used by the natives as arrow poison. **Gas** Gas gangrene occurred with us but was **gangrene** infrequent. Healing of gunshot wounds was usually particularly good when not disturbed by tedious sick transport which, unfortunately, had to occur more and more in the later period. Among special wounds deep bites and tears from carnivora were frequently observed; they were almost always severely infected and healed slowly. **Snakes** Wounds by poisonous snakes were in general rare. On the other hand in the region of the Lukuledi valley severe eye inflammations from the ejected saliva of the African spitting snake frequently occurred (*naja haje*). This healed rapidly and after some days the temporary loss of sight was restored.

Appendicitis Appendix operations on Europeans were required rather often. Among natives true appendicitis was found twice by Staff-Surgeon Dr Hoering and myself and once or twice by government doctor Dr Thierfelder. This disease appears to be very rare in natives. This can hardly be attributed to diet as this was the same for natives and whites.

Malaria The chief sickness was naturally malaria. No one came through the war without a great number of attacks of malaria and even those who had remained spared throughout the previous years and had regarded themselves as immune on some ground or other had to believe in it. Now malaria was usually regarded by our troops simply as part of the war and often, on account of the shortage, the whole course of the attack was gone through by our porters while on the march. In course of time, however, these repeated fevers weakened our health very much. Chronic anaemia, cardiac insufficiency and diseases of the spleen and liver were the results and in 1917 the health of our Europeans was very bad. At times, in such formations as were daily in specially unfavourable regions, eighty per cent of our Europeans were sick and many times there

were companies in which only two or three Europeans were fit for service instead of fifteen to twenty.

Quinine prophylaxis It is true that a general strongly controlled quinine prophylaxis had been the rule with us when our stock of quinine permitted. In certain formations where it had been carried out very temporarily, and on account of shortage of quinine only one gramme and a half weekly in two doses of one gramme and one-half gramme could be given, it only partly fulfilled its purpose. Later through further shortage it had to be quite omitted.

Tropical malaria, as in peacetime, stood in the foreground during the war, yet in the further course of the campaign the tertian parasite appeared more and more. The English made the same observation; according to my information they had chiefly tertian fever at the end of 1918. Tertian malaria was usually severe and extraordinarily resistant. How this quite surprising amount of tertian malaria in the East African seat of war was caused escapes my knowledge at present. Partly it may be that after a treated mixed infection of *Malaria tropica* and *M. tertiana*, a tertian frequently remained.

Epidemic malaria In 1915 I had the opportunity to observe a severe epidemic in Usambara. There an epidemic broke out in the mountain village of Bungu, manifested by periodical fever, rigors, vomiting and in part bloody diarrhoea and had caused nine fatalities among the seventy male inhabitants. Owing to the danger of a further spread of the epidemic, unknown among the troops, I was sent to Bungu and established that almost all the men of the village were infected with *M. tertiana* and a number with *M. tropica*. Some of the sick were already in a very bad condition. In Bungu there were no mosquitoes, but they were present in great numbers below on the swamps of the Usambara railway and there the male villagers had been accustomed by turns to guard the railway at night for months. Amongst the women there occurred only quite a few light infections with *M. tropica* and *M. tertiana* which had arisen from marketing in a lower-lying place. The epidemic could now be brought quickly to an end by the use of quinine.

Treatment of natives Our coloured troops had to suffer severely from malaria but as a rule a man with fever was easily cured by one or two doses of quinine. We never came into the field quite without quinine even for the natives. Efforts to treat the malaria-sick natives in hospital without quinine on account of shortage, often turned out badly and removed from the troops for a longer time important strength which would otherwise have been quickly restored. At the same time it was repeatedly sought to save and shorten the quinine cure in Europeans, but it has been shown that such economy is false and that we should not deviate from a complete dosage of thirty grammes of quinine. In general it has proved good to give one gramme of quinine for seven more days after the fall of the fever and then to give an interval which in my experience should not exceed four days. In resistant malaria it was often necessary to give one gramme and a half instead of one gramme and then give the important quinine-free interval. One of our Europeans had been given one gramme and a half of quinine daily for five successive months without interval and in spite

of this during this time had tertian relapses. In such a case the use of salvarsan was usually but not always accompanied by good results. On Balfour's direction the English had introduced a form of treatment with very large (at least a two-gramme) dose which had been taken daily for from one to two months without interruption. The treatment appeared, however, to have been maintained only during the days of hospital treatment and, after release, to have been quite ignored. Thus is explained the still higher morbidity and mortality of the English from malaria as compared with us.

Blackwater fever Blackwater fever, about the always disputed etiology of which nothing can be said here, demanded severe sacrifices from us and each looks back on this disease with sadness. Its importance for us is best shown by the fact that of the deaths among Europeans known to me from the beginning of the war to the end of June 1917, not counting the fatal wounds, 64·2 per cent were caused by blackwater fever. In one specially interesting case after complete anuria for five days, 500c.c. of bloody urine were again passed. The English doctor who now took over the treatment, told me later that the sick man had been tormented with complete anuria for a further eight days up to his death. In another desperate case I tried, by strong irrigation of the bladder and by bladder injections, to exert a stimulus on the kidney secretion, which might be possible indirectly by influence on the ureters. After the bladder injection when the bladder emptied itself, usually much later, it appeared that more was evacuated than had been injected and the discharged fluid was strongly turbid and albuminous after filtration but this increase and change was only due to remains of urine and detritus. It was always noticed that a good physical action seemed to be exerted on the patient when the Janet method was used. It was of short duration and is worthy of further study. As I found later, washing of the bladder should be brought into use earlier in blackwater fever. Blackwater fever was not observed in natives.

Blackwater fever in natives **relapsing fever** With the return of rain on the road from Kimamba to Handeni, lying between us and the Central and Usambara railways, partly including old caravan roads, we had to expect that the troops would suffer considerably from African relapsing fever. The right lines for dealing with this disease, laid down by Robert Koch, were well understood by our Europeans, who had become somewhat prudent by their own sufferings and in peacetime the tick-infested rest-houses were almost always avoided. The causal connection between ticks and relapsing fever was long known even to the blacks. On the other hand European rest-houses were of great advantage to the European when he travelled without tent and baggage and were a necessity on the safari roads. The attempt to make these new rest-houses somewhat hygienic by cementing and by keeping at a distance the often tick-infested luggage of the natives, proved good. Indeed relapsing fever was often enough observed but never so much as to become an actual menace to the troops. The cases were often very severe and resistant; several natives died in collapse. Severe inflammations of the iris were frequent after effects. Salvarsan almost always proved to be an efficient remedy for relapsing fever. Immunity acquired against

African relapsing fever appears only to last a short time; twice I saw severe reinfections after only eight to nine weeks.

Sleeping sickness The appearance of sleeping sickness also among the troops had to be reckoned with as soon as military operations led us into the infected regions. The work of combating this epidemic disease had been undertaken by Robert Koch, and his pupil and successor in East Africa, F. K. Kleine, had to some extent completed the research and practical campaign against sleeping sickness which found ready acceptance abroad. What science had done in peacetime served now for the use of the troops. Hence the epidemic of *Tr. gambiense* on Tanganyika and in the Rufiji valley only caused extremely little sacrifice. Later, on our march to the south, we entered the regions of the more acute form of sleeping sickness caused by *Tr. rhodesiense*. We found some new foci both in German and Portuguese territory. By this opportunity, with the cooperation of the Veterinary Surgeon Dr Huber, I succeeded, by a large number of experiments, in refuting the view, held by many investigators, of the identity of the causes of tsetse disease of animals (*Tr. brucei*) with the human *Tr. rhodesiense*. Altogether one European and twenty-two natives fell sick of Rhodesian sleeping sickness. In the European, whose blood swarmed with trypanosomes, severe haemoglobinuria appeared shortly before death, whether blackwater fever as a complication or as a result of the trypanosomiasis must remain undecided. In advanced cases oedema of the legs and sexual organs was observed and once ascites also. Gland swellings were usually very slight or hardly recognizable and were more pronounced in cases of long duration. In this disease, so unfavourable prognostically, a combination of tartar emetic and atoxyl appeared to act best.

Staff-Surgeons Dr Breuer and Dr Kudicke, together with the late Dr Woelffel, have made a large series of experiments and will be able, I hope, to report later on.

Dysentery Dysentery is one of the diseases that cost us great sacrifice especially among askaris and porters. It appeared chiefly as amoebic dysentery but also very often as bacillary dysentery. So far as I know and so far as such investigations were possible it was a question in the later cases of the Flexner type almost exclusively. I was informed by the English doctors that bacillary dysentery (Flexner) was far more frequent among the troops than amoebic dysenteries that could probably be regarded as due to flagellates which were also observed by us. Emetin naturally played a large part in the treatment of amoebic dysentery. Unfortunately, our supplies of this drug were so scanty that we could only use it for natives exceptionally during times of very severe dysentery. Usually in acute amoebic dysentery, after a preliminary treatment with sodium sulphate, emetin hydrochloride was injected intravenously in doses of 0.08 to 0.1 gramme for adults according to body weight for four days and on the fifth day, in order to obtain a more lasting effect, 0.1 to 0.12 gramme intramuscularly and the same procedure repeated after eight days. We had favourable results with this in recent dysentery; in old cases with numerous

cysts the method failed, as is known, very often. The vegetative forms of amoeba often appear to become very resistant; at least I saw a fatal case in which large doses of emetin scarcely exercised any influence on these forms which were present in the stools in great numbers. It is so tempting to give still larger doses of emetin and to carry on the emetin treatment for a long time that great care is advisable, as the patients are weakened, doubtless by the poisonous action of emetin. I agree also with Martin Mayer's opinion that by a too long course of after-treatment the amoebic strains may become fast to emetin.

Intestinal douches, highly recommended from Kartulis' researches on dysentery, were a valuable aid to me in many chronic cases of dysentery and were usually well borne by the patients. Two litres of 0.5 per cent tannin, 0.1 to 0.2 per cent silver nitrate or 0.25 per cent protargol solution were used as irrigation fluid after preliminary emptying of the intestine by purgatives and enemata. Otherwise, rest in bed, which we could not often give to our sick, was always one of the most important means of treating dysentery.

Though we had to suffer very severely from amoebic and bacillary dysentery on the Rufiji and even as far as Mbemkuru, it rapidly disappeared almost completely when we went further south and entered the Lindi area. The appearance of the dry season exerted a favourable influence in causing the cessation of bacillary dysentery; in the case of amoebic dysentery perhaps the disappearance of the disease is connected with nutrition. During the periods of dysentery we had very little carbohydrate which was also of somewhat poor value, but much meat. The reverse occurred on the coast at Lindi where we remained free from dysentery and our provisions were plenty of good digestible carbohydrate and no meat. When later a very unusual supply of meat and shortage of flour again occurred, amoebic dysentery again appeared but never to such a troublesome extent as in the beginning of 1917.

Liver abscess repeatedly occurred as a sequel to amoebic dysentery and was treated by operation.

I wish to mention here shortly three dangerous cases of chronic catarrhal inflammation of the alimentary canal, about which it is not clear whether they are to be regarded as the result of chronic dysentery or as a disease *sui generis*. The clinical picture agreed with sprue. Especially were the bulky, frothy usually pale coloured dejections quite characteristic of sprue and the bodily strength and nutrition of the anaemic sick men was also much reduced; on the other hand the appearance of the buccal cavity was only characteristic of sprue in one case. In the two other cases there was no inflammation of the mouth and the mucous membrane of the tongue showed no marked atrophy. The action of pure milk diet in these three cases was very striking. We could then give this diet and combined it with good results with the fruit diet recommended for sprue. In one case it appeared to me that yellow photosantonin acted favourably. The bodily state of these three officers suffering from sprue was very doubtful for a long time but I hope that at least two of them have been finally restored to health.

Enteric

At the beginning of the war typhoid was no new disease in German East Africa though it was somewhat seldom seen. It was to be expected that the conditions of the war would cause an epidemic appearance of the disease. I already confirmed this in October 1915 in the main body of troops in the north and about the same time also in other formations. By general hygienic measures and also probably by vaccination a troublesome development of the epidemic was stayed and from the middle of March 1916 onwards, though we had now and then single cases of the disease among the troops, the power of the epidemic was broken. As in the case of dysentery it was almost always a question of contact infection and only once a small epidemic outbreak due to drinking water was observed. Otherwise as regards the course, sequelae and treatment of the disease, home experiences had full value. The mortality also according to my reckoning was the same as in Europe. A special infectious diseases hospital was built at Moshi for typhoid and dysentery and was removed later to Mombo.

Vaccine

For vaccination the vaccine of the Dar es Salaam institute was prepared at first. As, however, it soon appeared that conveyance of vaccine overland for great distances was not free from objection, I established an improvised field laboratory at Mombo and made the necessary vaccines by using the cultured typhoid bacilli from the blood and stools of our patients. A substitute for Fickers diagnostic was prepared in large quantity after the method of Proells' formalin typhoid broth. The vaccinations were carried out in eight companies including their porters, wives and children and naturally had some prospect of fulfilling their aim when done compulsorily by order of the commander. The general impression of the practical result of the triple vaccination was good, yet statistical records could not be made for we could no longer make a single sick list of our natives owing to the scarcity of paper.

Plague

Although some old plague centres existed in East Africa yet during the war it played a relatively unimportant part with us. Especially at Rombo on Kilimanjaro, where our camps were, the plague focus caused no damage. In Dar es Salaam the epidemic had entered through shipping commerce and at the beginning of the war had given rise to anxiety by the discovery of an epizootic among rats and the appearance of several human cases. Yet the danger became less through the stoppage of sea traffic and the epidemic soon came to an end. On Tanganyika two fatal cases of plague were observed in September 1914, which had been carried by the railway to Kigoma and Ujiji. There also there was no further spread. The campaign was conducted as usual by rat destruction and general hygienic measures.

Helminthic diseases

Of diseases due to worms, ancylostomiasis especially played an important part in wartime as in peace, when it had been one of the worst plagues in the country. Many of our natives were sacrificed to it and unfortunately, owing to shortage of Thymol, *B-Naphthol* and *Ol. Chenopodii*, we could often only give poor treatment. In Portuguese territory instead of these tried medicines we used picric acid with some success. Even among our Europeans ancylo-

stome eggs were not seldom found in the stools. As in them treatment was prompt there were seldom disturbances of long duration. *Strongyloides* larvae were frequently found in the stools. On the occasion of a complete examination of the patients of Field Hospital V, I found ten per cent of the Europeans infected with strongyloides. Such an infection, when weak, causes no special symptoms yet in some circumstances it may produce quite severe manifestations which can be explained by the fact that *Strongyloides stercoralis* can penetrate the intestinal mucous membrane and nourish itself on chyle. Between 1910 and 1917 I had the opportunity to examine repeatedly from time to time a European so infected. The stool regularly swarmed with strongyloides larvae. The patient was extraordinarily anaemic when I last saw him, was much reduced and had very frequent motions. I cannot judge whether the bad condition of his heart could be traced to the strongyloides or to his own earlier diseases. There was little treatment for strongyloides larvae; in the above case *Ext. Filicis* displayed more action than Thymol or Naphthol.

Digestive diseases Among digestive diseases the frequently fatal prussic acid poisoning of natives by eating bitter *muhogo* (manioc) roots calls for special mention. This manioc can be freed fairly well from its strong prussic acid content by dry heat or repeated long continued cooking in water and is then edible like sweet *muhogo*. There was often no time for this process and as manioc frequently formed almost the only food severe toxic symptoms often occurred. These poisonings are generally known in East Africa and have led Ziemann to form an etiological connection between them and sleeping sickness.

Manioc poisoning Scurvy and beriberi Scorbatic signs on the gums appeared at times in Europeans and were quickly cured by a diet of fresh vegetables. Diseases thought to be beriberi of the nervous kind were often reported yet it is questionable to me whether this was true beriberi. Two of these cases which I observed repeatedly were no beriberi in my opinion but to be considered as crippling manifestations after infectious diseases. The nourishment of Europeans at that time, if not particularly palatable was still not absolutely monotonous. Rice was always eaten in the unpolished form. We never observed Pellagra in spite of the fact that its presence in Central Africa is proved, especially through the investigations of Stannus, and that our natives had lived often for a long time almost entirely on maize which was bad and at times, indeed, very rotten. This does not support the theory of the alimentary origin of the disease through maize food yet, of course, is not quite opposed to it.

Pellagra Short interval fever, without the presence of parasites, whose etiology could not be more closely investigated owing to our kind of warfare, was repeatedly observed. Six Europeans and about twenty natives were sick with symptoms of a febrile exanthem. The very vivid eruption usually resembled measles, often rather more like scarlet fever. Otherwise the symptoms apart from the suddenly appearing fever and slight swelling of the superficial lymph glands over the whole body, were few; throat symptoms in particular were quite absent. Well marked pains in the joints and muscles, as in Dengue,

were not present, apart from lumbar pain. The sick persons complained of severe headache and felt very tired and weak. Jaundice was never observed. After from six to twelve days the patients recovered fairly quickly. There were no fatal cases. Slight short interval fever without parasites and without exanthem also occurred though not often. Species of *Phlebotomus* which came into consideration as carriers of a kind of Pappataci fever were numerous in many places.

Sandfly
fever

Small-pox
C.S.M.

If I now speak of an epidemic of small-pox, cerebro-spinal fever and croupous pneumonia in a special connection it is because these diseases succeeded each other rapidly in Portuguese East Africa and brought our troops into special difficulties by their united action. For, at that time, in spite of the epidemics a rest of long duration could not be contemplated and even a suitable isolation of the sick was almost impossible to carry out in the seat of war. After our crossing over into Portuguese territory, by repeated selection, constant supervision and fairly good vaccination, really favourable hygienic conditions had been established among our troops and their followers who came from German East Africa. There was, therefore, little anxiety that within this circle serious epidemics would arise to damage the campaign. The danger from outside was much greater, for the whole territory of Portuguese East Africa, where insufficient means existed for research into and combating transmissible diseases, must be regarded from the first as suspicious for epidemics. The porters and askari boys who came to the companies from the district were a very doubtful acquisition from a hygienic standpoint. However, from the indirect additions also which the troops received from distant districts the danger of an epidemic invasion was increased, for from news repeatedly received the frequent appearance of acute meningitis was observed in Nairobi, Mwanza and Zomba, and in Zomba and Blantyre a small-pox epidemic had appeared. The correctness of these suppositions was confirmed after March 1918 by the epidemic activity amongst our troops. At the end of February 1918 a number of small-pox cases had appeared amongst the local inhabitants which quickly spread about and soon affected the hitherto unvaccinated troop followers belonging to the district. We succeeded in again making highly active the almost useless remainder of the vaccine lymph brought with us from German East Africa, by repeated passages through man and calves, and to remove for the time being the danger of a small-pox epidemic amongst the troops by a thorough preliminary vaccination during the months of March, April and May of all those not vaccinated or insufficiently vaccinated. After the beginning of July 1918, however, some new cases of smallpox appeared which affected chiefly troop followers who had meantime entered as new additions, then even those natives who were successfully vaccinated three months previously. In many cases the exanthem was not well marked though it affected the face and frequently only slight eruptions appeared so that a differential diagnosis between varicella, variola or a different form of pox could not easily be made. Quite a number of cases, however, among those people who had been successfully vaccinated shortly before, ran a course of the typical

Vaccine
lymph

Modified
small-pox

appearance of true smallpox. I have myself observed some cases where in the same patients the large four-week-old scabs of our vaccination together with a full smallpox rash on the face and whole body could be seen. The secondary suppuration fever, when it appeared, was slight; the general symptoms especially ran a moderately light course. Only quite few cases, in whom also the visible mucous membranes were affected, ended fatally. If even the lymph protection is generally of very short duration in the tropics, still such occurrences contradict all that we know of immunity. As regards a part of our cases at least, it must have been a question of a form of pox such as have been described, for example, in the Cameroons, South Africa and America and investigated by von Prowazek more recently as Samoapox. I must refrain from entering into this more closely. Unfortunately similar observations, which Staff-Surgeon Kudicke had in hand, had been interrupted, for the hospital to which at that time our cases had been brought was attacked by the enemy on the march and only a small part of the cases were again met with. Later the epidemic increased among the troops so that during the march and in camp it was sought to make a true separation of healthy and sick, but a proper isolation in the infectious diseases section of a hospital was no longer possible. In some companies there were up to thirty sick at one time. Only quite severe cases were carried, the others had to march and our caravan displayed a curious appearance. At times we could not leave the sick behind lest they should be killed by enemy native tribes. In October 1918 all were infected and then peace followed. The rash usually healed without severe scarring but with light spots remaining. There could have been no object in an investigation to determine whether a later vaccination of our sick would have been successful for all our troops had been vaccinated against smallpox shortly before. It is astonishing that no European became infected.

U.S.M. The appearance of acute cerebro-spinal meningitis amongst the troops in the beginning of August 1918 and its further occurrence up to the armistice was not extensive but was a very serious occurrence owing to the constant danger to which the infection, flaring up here and there, exposed the troops. In all seventeen cases were observed, which ran a very acute course. Meningococci were recognizable in the cerebro-spinal fluid.

supous
monia
enza ?) The appearance of epidemic croupous pneumonia was of the greatest importance. This began in the second half of August 1918 at the time when, owing to the great strains of this period of the war, a weakening of bodily resistance was noticeable. Its origin can be determined when we know whether and when the English troops also were attacked by it. Epidemic bronchopneumonia, with a fairly rapid and severe course, had already in peacetime been repeatedly observed in German East Africa, especially on Lake Tanganyika, and had many times aroused the suspicion of the presence of plague which, however, was not determined. An active epidemic of croupous pneumonia as that which we had in the war had never yet been known to me; even the frequent occurrences of pneumonia among families, barracks and prisons left no doubt of such a possibility. The clinical picture, with its sudden

onset with high fever and pain in the side was usually quite characteristic and showed a critical fall of fever about from the seventh to the twelfth day. The scanty tenacious sputum was tinged with blood and showed either a rusty brown or even often a markedly red colour until resolution occurred. In some cases, when it was possible on arrival in camp later for me to stain and examine a smear of sputum, I found diplococci resembling Fraenkels pneumococcus. That, naturally, is not confirmatory especially as the number of these diplococci was very small. Among Europeans there were nine definite cases of croupous pneumonia of which two ended fatally. Amongst the natives the daily incidence was from 1·2 to 3·5 per cent of the troops, the whole number of cases in each company was from twenty-two to twenty-five and about two hundred and fifty cases altogether. Twenty-two fatal cases were observed amongst the natives; how many besides died of the disease amongst those left behind cannot be stated.

Transport The treatment of the sick was much hindered during the march and the more so as we were compelled, owing to lack of porters for the sick, to allow many of the slighter cases to go on foot. In spite of this at that time we had daily from ninety to a hundred hammocks with sick persons of all sorts and for this at least three to four porters for native sick and four to six for Europeans must be reckoned. Many of the porters themselves became sick owing to this very trying portering service.

Influenza In October the number of pneumonia cases rapidly diminished and later only sporadic cases were seen. This epidemic was clearly distinguishable from the so-called Spanish influenza of the existence of which we were not aware before the cessation of hostilities. It now affected us with great severity when we had to travel from Bismarckburg to Dar es Salaam on the infected railway and on infected ships at the end of November 1918 in the circumstances of the armistice. Of the whole one hundred and fifty-five Germans who had been able to hold out to the end of the war, eleven died of the disease. How many of our natives, after the cessation of war, now died of this pandemic plague I cannot say. From what I have seen and been informed, there was a great mortality.

Gentlemen, the tasks of our East African doctors in the war, of which I have sought to sketch a rough picture, were, as you have seen, very many-sided. That we have always overcome them fills us with satisfaction. To pick out single names of doctors here does injustice to others who have done no less. However, amongst the names of all East African doctors, I think that the conspicuous cooperation of our assistants, the sanitary non-commissioned officers as well as the sisters must be remembered. The professional cheerfulness and knowledge, the selfless help and bravery of our non-commissioned officers deserves the highest praise. And to the gracious work of the sisters the thanks of every single trooper are due. The services also of our black assistants, sanitary askaris and sanitary boys must not be forgotten. Their diligent cooperation in the medical service has relieved us of much: their courage in battle has saved the life of many wounded and the remembrance of their exemplary fidelity and attachment will live in our hearts for ever.

A Note on the Seasonal Rains in East Africa and their Causation

By A. Walter

IN a region situated as the British East Africa territories are under the influence of well-defined seasons of alternating rainfall and dryness, the advent of the rainy seasons is perhaps the most important event in each succeeding year.

These territories are almost entirely dependent on agriculture for their economic prosperity, and farmers, settlers, tradesmen and government officials alike each turn with anxiety to the prospects of the seasonal rains. Of recent years the inauguration of the Meteorological Service has given an added interest to the question of forecasts both seasonal and daily with a consequent hope and expectation that attempts at forecasting will prove sufficiently successful to be of real assistance to the planting interests.

During the past eighteen months, daily and weekly regional forecasts have been issued with a considerable amount of success from the central office of the service in Nairobi. The basis on which these forecasts have been made to depend has been communicated to the press on several occasions, and it is now considered advisable to summarize them for the readers of *Tanganyika Notes and Records* with special reference to Tanganyika Territory.

Correctly to understand and appreciate these attempts at forecasting, the main rain-producing factors in these regions must be understood.

Cloud and precipitation of moisture in any form can only occur when the humidity contained in the atmosphere is condensed by cooling the air below the temperature of the dew point. Such cooling on any extensive scale depends on forces which raise considerable bodies of air from a lower to a higher level where, under the release of pressure, expansion and cooling can take place. The main causes which produce such vertical convection or the transfer of air in a vertical direction arise—

- (a) when the lower layers of the atmosphere are heated by radiation from the surface of the land under the influence of the sun's rays: the air tends to rise and is replaced by colder layers above it;
- (b) when turbulence is set up in rapidly flowing wind currents due to obstacles of any nature;
- (c) when a wind current is forced up over high plateaux or mountain ridges; and
- (d) when two air currents of different densities are in opposition or overtake each other.

NOTE.—The author of this article, A. Walter, O.B.E., is Director of the British East African Meteorological Service.

The first of these causes is generally known as thermal convection and in many cases the term convection alone is used exclusively to indicate the lifting of air as a result of thermal action producing instability. In this case the different layers of the atmosphere in a vertical direction become liable to interchange.

In the tropical regions of East Africa the most prolific cause of rainfall is thermal convection. It may occur in any part of these territories at any time of the year, but the peaks in the seasonal distribution occur immediately under the sun in its journey north and south, or with a slight lag of several weeks.

As a consequence of this we should expect to find a single season's rainfall at the extreme north and south of the tropics and a two-seasonal rainfall in between, varying in length and in the interval between the seasons according to its latitudinal position between the tropics. On the whole this is found to be the case but with some interesting and notable variations which will be referred to in the course of this paper.

In producing rainfall and thunderstorms, thermal convection is most effective in the lake regions and in localities where extensive forest growth has still resisted the destructive efforts of man. The reason for this is not far to seek: both influences increase the absolute humidity of the rising air to a marked degree and it is rare that a day passes in these regions without heavy rain showers or thunderstorms.

Afternoon and evening thunderstorms in the plateau regions often persist into the night and the early morning, apparently due to radiation cooling of the upper surface of the cloud. The very heavy thunderstorm rains and hail always appear to be associated with the penetration of the top of cloud into the ice layer of the upper strata.

In order to understand the mechanism of the other causes of East African rainfall, it is necessary to consider the seasonal pressure distribution over the continent as a whole. It is sufficiently well known to most readers that the movement of large air masses, giving rise to the great seasonal wind currents or monsoons, depends on the relative positions of the high and low pressure systems. On examining the pressure charts of Africa we find two main zones of high pressure—one over South Africa, the other over Egypt—and a region of low pressure near the Equator. The equatorial low has no movement of transition in longitude whereas the high pressure zones are made up of a series of high pressure systems moving from west to east with an interval of about ten days between the high peaks. Naturally these high pressure systems vary in intensity and in the time interval which elapses between the peaks.

The result of this distribution of pressure is to direct two main air currents toward the region of low pressure from the south-east and north-east. These are the well-known monsoon currents. In addition, two other air masses have been detected, one from the north-west and the other from the west. It is suspected that both these currents are off-shoots from the main monsoon currents modified in their passage across the continent from the westward, but

there is still some uncertainty as to their origin which cannot be cleared up until the synoptic chart of Africa is completed by the development of the Central and West African Services.

With these main air movements in mind, let us now return to a consideration of the remaining causes of rainfall referred to above.

When the two great monsoon currents reach a moderate to strong velocity it is noticed that frequent showers occur, especially along the coastal regions. These are very noticeable in the neighbourhood of any small islands. Over and near Zanzibar it is easy to detect the turbulent condition of the currents, the obstacles being of a very material nature although the rise in the land is not sufficient to produce the third or orographic type of rain. Similar sudden showers are noticeable out at sea giving rise to the impression that the turbulence is caused by irregular columns of air rising under the influence of thermal convection throwing the main current into turbulent eddies.

These are the showers which are experienced all along the coasts of East Africa during the period of the two monsoon currents. The two seasons are clearly defined in this region, but the rains of the south-east trade wind are heavier and more persistent. It is believed that the principal cause of this differentiation between the monsoon rains is to be found—

- (a) in the wide expanse of ocean over which the south-east trade wind travels as compared with the north-east monsoon;
- (b) the steeper pressure gradients from the south leading to a greater strength of the south-east trade, thus giving rise to more active mechanical turbulence;
- (c) The more intensive thermal convection which occurs over East Africa in advance of the oncoming south-east trade as compared with the north-east trade.

The mechanism of *orographic rain* is simple. The oncoming air currents are forced up the mountain or plateau slopes and under the influence of the reduced pressure with height cool rapidly.

The height at which cloud and precipitation forms will depend on three factors—

- (a) the strength of the current;
- (b) the absolute humidity of the incoming air; and
- (c) the initial temperature of the current.

The cloud layer forms at a low level during the night hours and in consequence orographic rain is much more frequent at that time and in the early morning than during the daytime.

If the strength of the current is such that the rise up the slopes is gradual, the air tends to acquire the temperature of the land over which it is passing and rain is infrequent. Where the air is forced up the slope rapidly, the decrease of temperature due to expansion of the air under the reduced pressure is alone operative. This change of temperature is known technically as "adiabatic." Sometimes showers from both mechanical turbulence as well as from orographic influence combine.

Orographic rains occur all along the high mountain and plateau ridges in East Africa.

It remains to consider the fourth cause by which air is raised to a higher level, namely, the under-cutting of a warm damp air current by a colder and heavier one. The heaviest general rains are due to this cause. Vast masses of air over a wide area are raised and cooled, the moisture being precipitated copiously for long periods. This type of rainfall is generally termed "*frontal*" as it occurs along the front formed by the opposing or converging air currents. In East Africa rains of this type, although not entirely similar to the frontal rains of temperate regions which are associated with cyclonic action, always occur where any of the main air currents referred to in previous paragraphs are in opposition or convergence. If the south-east trade sets in late after the north-east monsoon has ceased to appear on the northern part of the East Coast, the so-called "long rains" of this region which extends all along the eastern escarpment of the Rift fail, and agricultural interests are left with the intermittent thermal convection rains and the light orographic rains. The same condition obtains along the Usambaras in Tanganyika.

If the westerly or north-westerly currents are in convergence on either of the two monsoonal currents, rains are also heavy and are often associated with forenoon thunderstorms. The rains do not form along a well-defined frontal line as in temperate regions, but are diffused over a large area.

The exact mechanism of these *pseudo-frontal* rains is not yet fully understood but every synoptic chart shows evidence of the under-cutting of the denser air when the rains are heavy in the regions indicated.

The mid-year rains in the Kenya Highlands —Plateau, Trans Nzoia and Laikipia—always appear to be associated with the incursion of westerly winds in opposition to the south-east trades.

In Tanganyika, it is becoming increasingly evident that the absence of westerly winds during the period of intense thermal convective action between November and April leave the country dependent on scattered afternoon and evening thundershowers.

It seems probable that these westerlies originate from the same source as those of the Kenya plateaux mid-year westerlies, the shift in latitude being seasonal.

Let us now consider some of the rules for forecasting which have been elaborated since the drawing of the synoptic charts in the central office in Nairobi at the beginning of 1937.

The daily synoptic chart is drawn from the plotting of results from over three hundred stations extending from the Mediterranean on the north to Cape Town on the south, from the Atlantic Ocean on the west to Seychelles and Mauritius in the Indian Ocean on the east. Fifty of these stations belong to the network of our British East African Service itself. The results from the remaining stations are received by wireless through Messrs Cable and Wireless, Limited, and are emitted by the following services :— Egypt, Sudan, Italian

East Africa, British and French Somaliland, Madagascar, Portuguese East and West Africa, Southern and Northern Rhodesia, South Africa.

The observations from all these stations are received within three or four hours of their recording and two synoptic charts are prepared, one for the 06·00 G.M.T. observations and the other for the 12·00 G.M.T. observations, the charts in the central office being completed by 12·30 and 18·30 respectively, local time.

In the British East African Service two charts are drawn, one on a scale of one in ten million for the whole of Africa and the other, used mainly for aviation purposes, on a scale of one in five million covering the region of British East Africa and those neighbouring territories such as Madagascar, Italian East Africa, Sudan, Belgian Congo and the Rhodesias, in which the conditions are considered likely to have an immediate bearing on the local forecasts.

The first work of the forecaster is to draw the lines of equal pressure, temperatures and humidity. From these he is able to estimate the relative position of the high and low pressure systems, and hence the probable strength and direction of the air currents; the region of high and low temperatures and the areas in which humidity conditions are sufficiently high to lead to the probability of low cloud formations. He next examines the results of the large number of pilot balloon observations showing the direction, velocity and depth of the various air currents. Although it is not possible to lay down hard-and-fast rules for forecasting in the tropics, it is possible to indicate the main lines on which the forecaster proceeds.

As already stated, the steepness of the pressure gradient from the north and south enables the probable strength of the main air currents to be estimated and the forecast of coastal showers, night or morning cloud, drizzle, light rain or mist, will depend on the forecaster's estimate of the probable changes in these currents during the next twenty-four hours. Instability or intense thermal convection is indicated :—

(1) By the absence or weakening of the main air currents.

(2) By great variability in direction or velocity of wind with height. For this instability to give rise to thunderstorms or afternoon showers, the humidity as indicated by the dew point temperatures must generally be above 60°F on the twelve-hundred-metre plateau level to which all pressures, temperatures and humidity are reduced before charting.

Frontal rains will occur in the region separating the main air currents and the under-cutting of the denser current is generally well indicated by the pilot balloon observations; for instance, south-east winds giving place to north-easterlies above them.

Naturally the interpretation of the chart is a task for the trained technical officers of the service, and there are generally a large number of small probabilities which combine to make a certainty in the mind of the forecaster.

It may generally be stated with confidence :—

1. That the seasonal instability rains never fail, although they may vary in intensity.
2. That the long and short rains may fail in the regions where they occur—
 - (a) because the south-east trade sets in after the north-east monsoon has receded northwards (the long rains fail) ;
 - (b) because the north-east monsoon sets in after the south-east has shifted southward (the short rains fail) ;
 - (c) because one or other sets in after the intense instability peak has passed northward or southward.
3. The mid-year plateau rains are short either because the south-east trade is not strong enough to penetrate into the highlands, or because the westerly winds are weak or absent.
4. The Tanganyika rains inland between November and April are short because—
 - (a) radiation and consequent instability is weak ;
 - (b) the north-east or south-east currents penetrate well into the interior and so decrease the chances of instability occurring ;
 - (c) the westerly upper winds are weak or absent.

There is little or no evidence to show that the north-east or south-east air currents lead to increasing rain in Central Tanganyika. They do, however, affect the rains on the high plateaux and in the Usambara-Kilimanjaro region and on the coast.

Naturally a great deal of work has yet to be done in the study of the synoptic charts which only date in their present complete form from January 1938. It is improbable that any further great advance will be made until it becomes possible to determine the upper air temperatures and humidity. So much of the forecast work is based on theoretical considerations and assumptions, but the cost of securing such upper air observations is at present prohibitive, and forecasting must proceed for the time being on a basis of patient trial and error.

There is one much discussed problem which, I think, should be referred to in conclusion. This is the possible influence of forest growth on rainfall. It will be noted that reference has been made in several paragraphs of this paper to the existence of considerable thermal convection leading to instability on days when the general monsoon wind currents are in abeyance. From an examination of the conditions in the inland regions of East Africa, there does certainly appear to be some justification for considering that the effect of forest growth in determining the incidence of local afternoon showers and thunderstorms is sufficiently marked to warrant further experimental plantations in those regions where a shortage of instability rains occurs during several months of the year. This is very marked, for instance, in the central plains of Tanganyika. To break the persistent drought by only a few showers would be of immense benefit to the regions concerned, but the cost of nursing young forest growth in regions at present subject to prolonged seasonal drought may be found too heavy.

Provisional Macroscopic Key to the Identification of certain Timbers of Tanganyika Territory

By J. Pitt

WITH AN INDEX BY L. WIGG

Requirements.—A good hand lens, a strong sharp knife (should be sharp enough to cut the hairs when scraped along the forearm) and plenty of patience.

Method.—Unless otherwise stated, all clues refer to a clean cut on the cross section of the specimen. Features are usually brought up more clearly with the aid of a little moisture (saliva).

Explanation of terms used: *Pore* (or vessel).—A feature of all angiosperms, used for conveying the sap.

Parenchyma.—Soft tissue used for storing food reserves; generally lighter than the surrounding tissues, but often not visible unless the wood is moistened. *Parenchyma* may occur as:

- (i) *Paratracheal Parenchyma*: enclosing the pores; this may be—
 - (a) *Vasicentric*, surrounding the vessels but with no lateral extensions;
 - (b) *Aliform*, as above but with wings or lateral extensions;
 - (c) *Confluent*, where the lateral extensions have joined to form bands; all pores are more or less “in” the bands.

- (ii) *Apotracheal Parenchyma*: which has developed independently of the pores; it may be—(a) *Diffuse*, isolated cells (these need looking for carefully); (b) *Terminal*, thin (generally one-celled) bands at the end of the growth rings; (c) *Metatracheal* bands (often broad and numerous), which do not include all the pores. This form is often difficult to distinguish from confluent, but if some pores are found without vasicentric parenchyma outside the bands, these bands are then of metatracheal origin.

Rays.—A special form of parenchyma in lines radiating from the medulla (or centre of the plant).

Fibres.—The tissues which occur in between the pores, rays and parenchyma.

Storied Structure (Ripple marks).—Caused by the various tissues, generally the rays or fibres, being built up in regular layers; generally best visible as fine “lines” on the tangential surface. These are probably twenty or so to the centimetre so they need looking for carefully; generally they are more easily seen with the naked eye.

Tyloses.—Outgrowths from the cell walls filling the pores. Should not be confused with *gum* which has a homogeneous appearance.

Pores when touching may be multiple:— σ ID or chain:—ooooo

The *Cross section* shows a plane cut at right-angles to the axis of the log.

- | | | |
|---|---|---------------------------------|
| 2. Numerous bands of parenchyma, rays whitish | 3 | |
| 3. Pores of cells in parenchyma visible with lens, bands wider than intervening fibres, black material in many pores | | <i>Erythrina abyssinica.</i> |
| 3. Pores in parenchyma cells not visible with lens, bands about as wide as fibres | | <i>Sterculia appendiculata.</i> |
| 4. Parenchyma absent or obscure ... | 5 | |
| 4. Parenchyma present, generally in bands | 7 | |
| 5. Pores visible to naked eye, wood brown, rays shallow (two millimetres) | | <i>Hagenia abyssinica. (?)</i> |
| 5. Pores not visible to naked eye, rays deep (over five millimetres)... | 6 | |
| 6. Pores generally in groups of three to four | | <i>Rapania neurophylla.</i> |
| 6. Pores single and numerous | | <i>Agauria salicifolia.</i> |
| 7. Pores filled with tyloses | | <i>Sterculia quinqueloba.</i> |
| 7. Pores not filled with tyloses ... | 8 | |
| 8. Pores visible to naked eye, parenchyma bands thin but not continuous ... | | <i>Anisophyllea laurina.</i> |
| 8. Pores not visible to naked eye, bands continuous | 9 | |
| 9. Pores often touching tangentially ... | | <i>Faurea saligna.</i> |
| 9. Pores generally separate | | <i>Rapania rhododendroides.</i> |

GROUP III.—STORIED STRUCTURE PRESENT (look for carefully)

- | | | |
|--|---|----------------------------------|
| Wood cream or yellowish | 2 | |
| Wood brown, light brown or dark brown ... | 9 | |
| 2. Wood bright yellow | | <i>Lonchocarpus eriocalyx.</i> |
| 2. Wood not as above | 3 | |
| 3. Numerous and conspicuous bands of parenchyma, pores easily visible to naked eye | 4 | |
| 3. Parenchyma not in bands, pores hardly visible to naked eye | 5 | |
| 4. Bands generally wide as spaces in between, fibres orange on cross section | | <i>Ostryoderris stuhlmannii.</i> |
| 4. Bands generally narrower than spaces in between, fibres light brown on cross section | | <i>Lonchocarpus capassa.</i> |

5. Pores tending to form tangential rows	...	<i>Lasiosiphon glaucus.</i>
5. Pores not as above	6	
6. All pores single and scattered	7	
6. Some pores joining radially	8	
7. Space between rays several times wider than pores		<i>Bersama holstii.</i>
7. Space between rays about as wide as pores		<i>Randia kuhniana.</i>
8. Diffuse parenchyma present		<i>Maba abyssinica.</i>
8. Diffuse parenchyma absent		<i>Maba</i> sp.
9. Parenchyma absent or obscure	10	
9. Parenchyma present—may be diffuse	11	
10. Pores mostly single and evenly distributed		<i>Pteleopsis myrtifolia.</i>
10. Pores often touching and irregularly distributed		<i>Cylicodiscus battiscombei.</i>
11. Only diffuse parenchyma		<i>Bombax</i> sp.
11. Bands both terminal and meta-tracheal or confluent	12	
11. Bands only terminal, vasicentric parenchyma present	17	
12. Bands very numerous	13	
12. Bands few, purple streaks on longitudinal section		<i>Dalbergia nitidula.</i>
13. Wood coffee-brown on cross section, parenchyma sometimes aliform		<i>Pterocarpus angolensis.</i>
13. Wood red-brown or dark purple-brown on cross section	14	
14. Bands little lighter than fibres and not very conspicuous	15	
14. Bands much lighter than fibres and conspicuous to naked eye	16	
15. Pores not visible to naked eye, wood deep reddish-brown	{	<i>Pterocarpus zimmermannii.</i>
15. Pores easily visible to naked eye, wood deep purple		<i>P.</i> sp. nov. (Mbosi).
16. White dots in some pores		<i>Pterocarpus</i> nr. <i>chrysothrix</i> . (?)
16. Dots yellow but very rare		<i>Schwartzia madagascariensis.</i>
16. Dark gum in pores		<i>Barringtonia racemosa.</i>
17. Pores easily visible to naked eye		<i>Entandrophragma bussei.</i>
17. Pores not visible to naked eye, very numerous		<i>Terminalia sericea.</i>
		<i>Brachylaena hutchinsii.</i>

GROUP IV.—PORES WITH OBLIQUE, TANGENTIAL ("RING POROUS") OR RADIAL
ARRANGEMENT

Pores sometimes grouped obliquely, vasicentric parenchyma generally present ...	2	
Pores sometimes grouped tangentially—"ring porous"	5	
Pores grouped radially, parenchyma present or absent	10	
2. Pores large and in large "islands" of parenchyma, only some joined obliquely; no terminal parenchyma		<i>Albizzia versicolor.</i>
2. Pores small (hardly or not visible to naked eye), nearly all joined obliquely; terminal parenchyma present	3	
3. Wood dark brown		<i>Combretum schumanii.</i>
3. Wood yellowish		<i>Combretum molle.</i>
3. Wood pale or reddish-brown, many bands of parenchyma	4	
4. Bands easily visible to naked eye, wood reddish-brown		<i>Mimusops</i> sp. (168).
4. Bands not easily visible to naked eye, wood pale brown		<i>Chrysophyllum zimmermannii.</i>
5. Wood of definite yellow colour		Mpafwa (Rungwe).
5. Wood not yellow	6	
6. Wood greyish	7	
6. Wood light or creamish-brown	8	
7. "Rings" really rows of large ducts, pores hardly visible to naked eye, generally in short radial lines rays rather thinner than pores		<i>Avicennia officinalis.</i>
7. Pores visible to naked eye, rays almost as wide as pores		<i>Vitex shirensis.</i>
8. Parenchyma present in many conspicuous bands		<i>Markhamia obtusifolia.</i>
8. Parenchyma not as above	9	
9. Pores easily visible to naked eye		<i>Vitex keniensis</i>
9. Pores not easily visible to naked eye		<i>Calodendron eickii.</i>
10. Parenchyma (other than terminal) absent or obscure	11	
10. Parenchyma present, generally diffuse or metatracheal	15	
11. Terminal parenchyma present	12	
11. Terminal parenchyma absent	13	
12. Rows of pores visible to naked eye as white dots, wood pale yellow-brown		<i>Boscia fischeri.</i>

12. Rows of pores not as above, wood coffee-brown	...	<i>Clausena melioides.</i>
13. Pores visible to naked eye ...	...	<i>Bridelia micrantha.</i>
13. Pores visible only with lens ...	14	
14. Nearly all pores in radial groups (of four to six)	...	<i>Olea hochstetteri.</i>
14. Only some pores in radial groups	...	<i>Olea chrysophylla.</i>
15. Parenchyma diffuse, no definite bands except terminal	16	
15. Parenchyma indefinite, though not always very conspicuous ...	18	
16. Pores not visible to naked eye	...	<i>Maba</i> sp.
16. Pores visible to naked eye ...	17	
17. Pores mostly in chains ...	...	<i>Mitragyna rubrostipulata.</i>
17. Pores mostly multiple ...	...	"Kuti"— <i>Sideroxylon</i> . (?)
18. Wood grey	...	<i>Maba</i> sp. nr. <i>buxifolia</i> .
18. Wood not grey	19	
19. Rays mostly broader than the pores	...	<i>Rawsonia usambarensis.</i>
19. Rays narrower than the pores	20	
20. Wood whitish, pores visible to naked eye, bands thin and irregular	...	<i>Chrysophyllum albidum.</i>
20. Wood light or dark reddish-brown, pores not or hardly visible to naked eye	21	
21. Pores in chains	...	<i>Gymnosporia</i> sp.
21. Pores multiple	22	
22. Pores in large groups, often arranged obliquely, wood light red-brown	...	<i>Mimusops</i> sp.
22. Pores in small groups, rarely arranged obliquely	23	
23. Wood dark red-brown ...	...	<i>Mimusops cuneifolia.</i>
23. Wood light red-brown ...	...	<i>Mimusops densiflora.</i>

GROUP V.—PARENCHYMA (OTHER THAN TERMINAL) ABSENT OR OBSCURE

Terminal parenchyma present	2	
Terminal parenchyma absent	11	
2. Wood cream, coffee or greenish-brown	3	
2. Wood brown or red-brown	6	
3. Wood cream	4	
3. Wood coffee or greenish-brown ...	5	
4. Pores very numerous and in more or less tangential bands, many visible to naked eye	...	<i>Calodendron eickii.</i>

- | | | |
|---|-----|--|
| 4. Pores frequent but rarely touching excepting radially, not visible to naked eye | ... | <i>Schrebera kiloneura.</i> |
| 4. Pores as above, visible to naked eye | ... | <i>Sclerocarya birraea</i> var. |
| 5. Pores (two to four) frequently touching radially, not easily visible to naked eye | ... | <i>multifoliolata.</i> |
| 5. Pores (two) only occasionally touching radially, visible to naked eye, gum in pores, ends of rays visible as black dots on tangential surface | ... | <i>Clausena melioides.</i> |
| 5. Pores almost all separate, visible to naked eye, gum in pores, ends of rays not visible on tangential section | ... | <i>Diospyros mespiliformis.</i> |
| 6. Light brown gum in pores | ... | <i>Lovoa swynnertonii.</i> |
| 6. No gum in pores | ... | <i>Commiphora ugogensis.</i> |
| 7. Pores easily visible to naked eye | 7 | |
| 7. Pores not easily visible to naked eye, wood hard | 8 | |
| 8. Wood light or pinkish-brown | ... | <i>Pappea ugandensis.</i> |
| 8. Wood dark reddish-brown | 9 | <i>Ekebergia rupelliana.</i> |
| 9. Rays lighter than fibres, fairly easily visible to naked eye | 10 | |
| 9. Rays much the same colour as the fibres, hard to see | ... | <i>Entandrophragma</i> sp. na. <i>utile.</i> |
| 10. Space between rays generally wider than pores, pore walls distinct | ... | <i>Entandrophragma stolzii.</i> |
| 10. Space between rays about as wide as pore, pore walls not distinct | ... | <i>Sclerocarya caffra.</i> |
| 11. Rays as wide or wider than pore | 12 | |
| 11. Rays not as wide as pores | 15 | |
| 12. Wood light reddish-brown, rays about as wide as pores | ... | <i>Agauria salicifolia.</i> |
| 12. Wood creamish- or grey-brown | 13 | |
| 13. Space between rays about as wide as pores | ... | <i>Vitex cienkowski.</i> |
| 13. Space between rays about three times as wide as pores | 14 | |
| 14. Pores (two to three) often grouped radially | ... | <i>Polyscias</i> sp. |
| 14. Pores generally single, individual fibres visible with lens | ... | <i>Cussonia spicata.</i> |
| 15. Gum present in some pores | 16 | |

- | | | |
|---|----|----------------------------------|
| 15. No gum present | 22 | |
| 16. Wood light pink-brown on cross section | | <i>Xylocarpus moluccensis.</i> |
| 16. Wood not as above | 17 | |
| 17. Wood green-brown on cross section | | <i>Warburgia stuhlmannii.</i> |
| 17. Wood coffee- or red-brown ... | 18 | |
| 18. Space between rays generally as wide as pores... .. | 19 | |
| 18. Space between rays wider than pores | 21 | |
| 19. Ends of rays visible as dark dots on tangential section | | <i>Khaya nyasica.</i> |
| 19. Ends of rays not visible on tangential section ... | 20 | |
| 20. Wood coffee-brown ... | | <i>Ocotea usambarensis.</i> |
| 20. Wood purplish-brown | | <i>Allanblackia stuhlmannii.</i> |
| 21. Wood coffee-brown, terminal parenchyma sometimes present | | <i>Diospyros mespiliformis.</i> |
| 21. Wood red-brown ... | | <i>Hagenia abyssinica. (?)</i> |
| 22. Pores more or less invisible to naked eye | 23 | |
| 22. Pores easily visible to naked eye | 25 | |
| 23. Pores tending to form short radial chains | | <i>Olea chrysophylla.</i> |
| 23. Pores nearly all single ... | 24 | |
| 24. Pores very evenly distributed | | <i>Osyris tenuifolia.</i> |
| 24. Pores with slightly irregular distribution | | <i>Adina microcephala.</i> |
| 25. Ends of rays not visible on tangential section | 26 | |
| 25. Ends of rays visible as dark dots on tangential section | 29 | |
| 26. Wood dark brown | 27 | |
| 26. Wood light brown | 28 | |
| 27. Pores single and evenly distributed | | <i>Pygeum africanum.</i> |
| 27. Pores generally single but occur mainly in the early (or "spring") wood | | <i>Ochna holstii.</i> |
| 28. Pores generally single or double, space between rays about as wide as pores... .. | | <i>Sonneratia caseolaris.</i> |
| 28. Pores often multiple, space between rays much narrower than pores | | <i>Macaranga kilimanjarica.</i> |

29. Wood pinkish-brown	30	
29. Wood cream or pale brown ...	31	
30. Wood soft, space between rays generally wider than pores		<i>Commiphora eminii.</i>
30. Wood fairly hard, space between rays only about as wide as pores		<i>Cylicodiscus battiscombeii.</i>
31. Space between rays much wider or narrower than pores...	32	
31. Space between rays about as wide as pores	33	
32. Space between rays wider than pores		<i>Cussonia spicata.</i>
32. Space between rays narrower than pores		<i>Allophyllus</i> sp.
33. Rays dark coloured and not easy to see on cross section...		<i>Lannea humilis.</i>
33. Rays light coloured and easy to see on cross section	34	
34. Pores very numerous occupying about twenty-five per cent of surface ...		<i>Croton</i> sp. nr. <i>megalocarpus.</i>
34. Pores frequent but not so numerous as above ...	35	
35. Rays about two millimetres deep (on <i>split</i> radial surface)		<i>Cephalosphaera usambarensis.</i>
35. Rays about one millimetre deep		<i>Lannea schimperii.</i>
		<i>Lannea fulva.</i>
		<i>Lannea stuhlmannii.</i>

GROUP VI.—DIFFUSE PARENCHYMA PRESENT

Pores hardly visible or invisible to naked eye	2	
Pores easily visible to naked eye	6	
2. Rays conspicuous as dark dots on tangential section, wood white		<i>Cornus volkensii.</i>
2. Rays not conspicuous on tangential section	3	
3. Pores mostly separate	4	
3. Pores mostly multiple	5	
4. Wood grey-brown		<i>Balanites</i> sp.
4. Wood cream, tending to storied arrangement		<i>Randia kuhniiana.</i>
5. Wood greyish, pores just visible to naked eye		<i>Royena fischeri.</i>
5. Wood cream, pores invisible to naked eye		<i>Maba abyssinica.</i>

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| 6. Rays conspicuous as dark dots on tangential section, wood white | ... | <i>Cornus volkensii.</i> |
| 6. Rays not conspicuous on tangential section | 7 | |
| 7. Wood light brown | 8 | |
| 7. Wood whitish, yellowish or grey-brown | 10 | |
| 8. Pores few, large and filled by tyloses | | <i>Bombax rhodonaphalon.</i> |
| 8. Pores many and no tyloses | 9 | |
| 9. Tendency to storied arrangement | | <i>Pteleopsis myrtifolia.</i> |
| 9. No tendency to storied arrangement | | <i>Mitragyna rubrostipulata.</i> |
| 10. Space between rays as wide as or wider than pores | 11 | |
| 10. Space between rays narrower than pores | 12 | |
| 11. Diffuse parenchyma very abundant, space between rays much wider than pores | | <i>Rauwolfia obliquinervis.</i> |
| 11. Diffuse parenchyma not very abundant, space between rays little wider than pores | | <i>Cassipourea redslobii.</i> |
| 12. Many pores multiple, wood grey-brown | | <i>Royena fischeri.</i> |
| 12. Few pores multiple | 13 | |
| 13. Cells of fibres visible with lens, wood whitish | | <i>Syzygium</i> sp. nr. <i>owariensis.</i> |
| 13. Cells of fibres not visible with lens, wood yellow-brown | | <i>Sapium elipticum.</i> |

GROUP VII (A).—(PARENCHYMA VASICENTRIC.)

PARENCHYMA PARATRACHEAL BUT NOT IN DEFINITE BANDS (EXCEPT TERMINAL)

- | | | |
|---|----|------------------------------|
| Parenchyma mainly vasicentric, not winged but sometimes confluent | 2 | |
| Parenchyma mainly aliform (winged) but sometimes confluent | | Group VII (b). |
| 2. Pores small and very numerous in large irregular masses of parenchyma, few large ducts with white "pith." | | <i>Strychnos heterodoxa.</i> |
| 2. Pores not as above | 3 | |
| 3. Terminal parenchyma absent | 4 | |
| 3. Terminal parenchyma present | 10 | |
| 4. Pores not visible to naked eye, wood whitish | | <i>Dialiopsis africana.</i> |
| 4. Pores visible to naked eye | 5 | |
| 5. Large "islands" of parenchyma easily visible to naked eye | | <i>Albizzia versicolor.</i> |

5. Parenchyma not easily visible to naked eye 6
6. Gum in pores, wood greyish-brown *Combretum splendens*.
6. No gum in pores 7
7. Wood brownish 8
7. Wood yellowish 9
8. Wood reddish-brown ... *Piptadenia africana*.
8. Wood golden-brown ... *Piptadenia buchananii*.
9. Pores many, often multiple *Antiaris usambarensis*
9. Pores few, generally single *Maesopsis eminii*.
10. Wood grey-brown, parenchyma sometimes confluent *Acacia nefasia*.
10. Wood not grey-brown 11
11. Pores not easily visible or invisible to naked eye 12
11. Pores easily visible to naked eye... 17
12. Ends of rays visible as dots on tangential section (use lens) ... 13
12. Ends of rays not visible on tangential section 14
13. Wood light or yellow-brown *Boscia salicifolia*.
13. Wood red or dark brown ... *Piptadenia hildebrandtii*.
14. Pores very numerous and evenly distributed, storied arrangement generally apparent... .. *Brachylaena hutchinsii*.
14. Pores not very numerous and generally unevenly distributed 15
15. Rays visible to naked eye ... *Teclea glomerata*.
15. Rays not visible to naked eye ... 16
16. Terminal parenchyma irregular and bands wavy *Terminalia stuhlmannii*.
16. Terminal parenchyma not as above *Zizyphus mucronata*.
17. Wood soft and light brown with dark brown streaks *Oxytigma msoo*.
17. Wood not as above 18
18. Bands of "terminal" parenchyma very numerous *Parinari excelsum*. (?)
18. Bands not numerous and sometimes broken 19
19. Wood red or red-brown on cross section 20

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|---|--------------------------------|
| 19. Wood dark brown on cross section | <i>Acacia campylacantha.</i> |
| 20. Dark coloured gum in pores, wood red | <i>Acacia benthamii.</i> |
| 20. No gum, but white dots in some pores | <i>Enterolobium africanum.</i> |

GROUP VII (B).—(PARENCHYMA ALIFORM.)

PARENCHYMA PARATRACHEAL BUT IN DEFINITE BANDS (EXCEPT TERMINAL)

- | | | |
|---|----|---------------------------------|
| Parenchyma mainly <i>aliform</i> but sometimes confluent | 1 | |
| Parenchyma mainly vasicentric but sometimes confluent | | Group VII (a). |
| 1. Gum in pores | 2 | |
| 1. No gum in pores but possibly tyloses present | 12 | |
| 2. Wood light, yellowish or pinkish-brown | 3 | |
| 2. Wood brown, dark brown or reddish-brown | 5 | |
| 3. Wood pinkish-brown, parenchyma whitish on freshly cut surface ... | | <i>Combretum zeyheri.</i> |
| 3. Wood not as above | 4 | |
| 4. Parenchyma difficult to see with naked eye, very rarely confluent, wood light brown | | <i>Combretum grandifolium.</i> |
| 4. Parenchyma easy to see, sometimes confluent, wood yellow-brown | | <i>Acacia hebecladoides.</i> |
| 5. Wood purplish-brown on tangential section | 6 | |
| 5. Wood not as above | 7 | |
| 6. Parenchyma sometimes confluent, sapwood yellow | | <i>Albizzia anthelmintica.</i> |
| 6. Parenchyma very rarely confluent | | <i>Trachylobium verrucosum.</i> |
| 7. Rays not visible to naked eye and even difficult to see with lens ... | 8 | |
| 7. Rays visible to naked eye ... | 9 | |
| 8. Rays visible as dark dots on tangential section | | <i>Albizzia brachycalyx.</i> |
| 8. Rays not visible on tangential section, wood almost black on cross section | | <i>Acacia roovumae.</i> |
| 9. Terminal parenchyma rare and bands not continuous ... | 10 | |
| 9. Terminal parenchyma present and bands continuous | 11 | |
| 10. Wood light coffee-brown... | | <i>Albizzia gummifera.</i> |

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| 10. Wood reddish-brown ... | <i>Albizzia harveyi</i> . |
| 11. Parenchyma sometimes confluent, few bands terminal parenchyma ... | <i>Acacia senegal</i> . |
| 11. Parenchyma rarely confluent, many bands terminal parenchyma ... | <i>Acacia pallens</i> . |
| 12. Tendency to irregular but storied arrangement, best seen on tangential section ... | 13 |
| 12. No such above tendency ... | 14 |
| 13. Wood reddish-brown ... | <i>Vangueria edulis</i> . |
| 13. Wood not reddish, but may be light pinkish-brown ... | <i>Brachystegia</i> spp. |
| 14. Wood dark or reddish-brown ... | 15 |
| 14. Wood light or yellowish-brown ... | 17 |
| 15. Rays visible to naked eye ... | <i>Afzelia quanzensis</i> . |
| 15. Rays not visible to naked eye ... | 16 |
| 16. Wood reddish-brown on cross section, pores very large, ends of rays visible on tangential section ... | <i>Vangueria edulis</i> . |
| 16. Wood dark brown on cross section, pores visible to naked eye, but not very large, rays not visible on tangential section ... | <i>Brachystegia microphylla</i> . |
| 17. Rays not visible to naked eye, parenchyma rarely confluent, wood light brown ... | <i>Englerodendron usambarensis</i> . |
| 17. Rays visible to naked eye, parenchyma quite often confluent, wood yellow-brown ... | 18 |
| 18. Some pores black on cross section and giving dark streaks on longitudinal sections ... | <i>Acacia hebecladoides</i> . |
| 18. Pores not as above ... | <i>Stereospermum kunthianum</i> . |

GROUP VIII (A).—(CONFLUENT). PARENCHYMA IN DEFINITE BANDS

Bands developed from confluent paratracheal parenchyma (that is, all pores in parenchyma bands) ... 1

Bands of metatracheal parenchyma, developed independently of pores (that is, some or all pores not included in bands) ...

Group VIII (b).

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|---|---|
| 1. Pores hardly visible or invisible to naked eye ... | 2 |
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| 1. Pores easily visible to naked eye ... | 4 | |
| 2. White stuff in pores on longitudinal section, rays narrow ... | 3 | |
| 2. No white stuff in pores, wood pinkish, rays about half as wide as pores ... | | <i>Garcinia</i> sp. |
| 3. Wood reddish-brown, white stuff in pores visible also on cross section ... | | <i>Syzygium cordatum</i> . |
| 3. Wood brown, white stuff in pores not visible on cross section ... | | <i>Syzygium</i> nr. <i>intermedium</i> . |
| 4. Rays not easily visible to naked eye ... | 5 | |
| 4. Rays easily visible to naked eye ... | 6 | |
| 5. Wood red-brown, red gum in pores ... | | <i>Cassia abbreviata</i> . |
| 5. Wood pink, tendency to storied arrangement ... | | <i>Brachystegia flagristipulata</i> . |
| 5. Wood greyish or yellowish-brown ... | | <i>Stereospermum kunthianum</i> . |
| 6. Wood darkish or orange-brown ... | 7 | |
| 6. Wood light or cream or greyish-brown ... | 9 | |
| 7. Ray cells on split radial surface clearly visible with lens, wood orange-brown ... | | <i>Allanblackia ulugurica</i> . |
| 7. Ray cells not clearly visible as above ... | 8 | |
| 8. Wood brown with narrow zone almost free of pores, little or no tyloses ... | | <i>Xylopia holstii</i> . |
| 8. Wood dark brown, no zones as above, much tyloses ... | | <i>Chlorophora excelsa</i> . |
| 9. Gum in pores ... | | <i>Acacia spirocarpa</i> . |
| 9. No gum in pores ... | 10 | |
| 10. Ends of rays as dots on tangential section, wood soft and greyish ... | | <i>Parkia africana</i> . |
| 10. Ends of rays as brown dots on tangential section, parenchyma bands about half width of pores ... | | <i>Markhamia platycalyx</i> . |
| 10. Ends of rays not visible on tangential section, parenchyma bands very thin ... | | <i>Ficus sycamorus</i> (?). (No. 4.) |

GROUP VIII (B).—(METATRACHEAL). PARENCHYMA IN DEFINITE BANDS

Bands confluent (all pores in bands) ... Group VIII (a).

Bands metatracheal (some or all pores not in bands) ... 1

1. Pores not or hardly visible to naked eye ... 2

1. Pores easily visible to naked eye ... 10

2. Bands of parenchyma pale purple and conspicuous on longitudinal section ... *Pleurostyliia africana*.

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| 2. Bands of parenchyma not as above ... | 3 | |
| 3. Some pores tending to be grouped radially | 4 | |
| 3. Pores not tending to be grouped radially | 5 | |
| 4. Some pores also grouped obliquely, wood light brown | | <i>Chrysophyllum zimmermanianum.</i> |
| 4. Pores grouped only radially, wood reddish-brown | | <i>Mimusops densiflora.</i> |
| 5. Wood pinkish or dark brown ... | 6 | |
| 5. Wood yellowish | 8 | |
| 6. Wood pinkish-brown | 7 | |
| 6. Wood dark brown (sapwood yellowish) tendency to storied arrangement | | <i>Schwartzia madagascarensis.</i> |
| 7. Some rays as wide or wider than pores | | <i>Elaeodendron stuhlmannii.</i> |
| 7. Rays narrower than pores, hardly visible even with lens | | <i>Catha edulis.</i> |
| 8. Ends of rays easily visible (with lens) on tangential section | | <i>Fagara merkeri.</i> |
| 8. Ends of rays not easily visible with lens on tangential section | 9 | |
| 9. Bands of terminal parenchyma easily distinguishable, pores often in bands ... | | <i>Turraea fischeri.</i> |
| 9. Terminal parenchyma absent or obscure, pores separate ... | | <i>Cassipourea mollis.</i> |
| 10. Wood yellow or creamish-yellow... | 11 | |
| 10. Wood light, reddish- or grey-brown | 12 | |
| 11. Wood dark yellow and hard, much tyloses in pores | | <i>Morus lactea.</i> |
| 11. Wood creamish and soft, no tyloses ... | | <i>Myrianthus holstii.</i> |
| 12. Rays not visible (even with lens) as dark dots on tangential section | 13 | |
| 12. Rays visible with lens as dark dots on tangential section | 16 | |
| 13. Space between rays much narrower than pores | 14 | |
| 13. Space between rays about as wide as pores, pores very numerous, wood deep brown, "gum" in pores visible on longitudinal section | | <i>Berchemia discolor.</i> |

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| 14. Bands of parenchyma not conspicuous to naked eye, wood light and soft | Macaranga nr. ruwenzorica. |
| 14. Bands of parenchyma conspicuous, wood heavy and hard | 15 |
| 15. Wood light brown on tangential section | Parinari mbola. |
| 15. Wood reddish brown on tangential section | Parinari holstii. |
| 16. Wood darkish reddish-brown | 17 |
| 16. Wood light brown, pinkish or greyish-brown | 18 |
| 17. Dark gum in pores, marked tendency to storied arrangement ... | Entandrophragma bussei. |
| 17. Tyloses in pores, little or no tendency to storied arrangement ... | Parinari excelsum. (?) |
| 18. Broad bands of parenchyma about as wide as pores | 19 |
| 18. Narrow bands of parenchyma not as wide as pores | 20 |
| 19. Wood greyish-brown | Ficus sycamorus (No. 106). |
| 19. Wood generally pinkish-brown | Ficus sonderi. |
| 20. Light brown dots in some pores | 21 |
| 20. No dots in pores | 22 |
| 21. Space between rays generally wider than pores, bands sometimes broken | Baikiea eminii. |
| 21. Space between rays about as wide as pores, bands mostly continuous | Cassipourea elliottii. (?) |
| 22. Bands of parenchyma numerous and light coloured | Bosquiea phoberos. |
| 22. Bands of parenchyma few and brown | Harungana madagascarensis. |

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Vitex keniensis, 31 (Nyamwezi : Mtalali; Sukuma : Msunugwi).
Vitex shirensis, 31 (Nyamwezi : Mpulu).
Warburgia stuhlmannii, 34 (Shambala : Mlifu; Swahili : Mkarambaki).
Xylocarpus obovata ?, 34 (coast name : Mkomavi).
Xylopia holstii, 40.
Zyzyphus mucronata, 37 (Nyamwezi : Mugugunwa; Swahili : Mkunazi).

A History of *Robusta* Coffee in Bukoba

By T. S. Jervis

INTRODUCTION

ROBUSTA coffee in Bukoba has generally been accepted as a true native of that area, an assumption based on the observations of the first European travellers who found it already established in the native gardens. Such information as I have been able to collect, however, leads me to regard this theory with considerable doubt, and in the following pages I present an argument in support of the contention that *Robusta* coffee is not truly indigenous to Bukoba, but that it was introduced into the area some three hundred and fifty years ago.

HISTORICAL BACKGROUND

The history of *Robusta* coffee in Bukoba is the history of the local aristocracy whose actual origin is wrapped in obscurity. Who they were and whence initially they came are matters rather of conjecture than of certain knowledge. We only know that when the dawn breaks in 1862 (Speke) the ruling class are of the so-called Hamitic stock and are established here, in what is now called Bukoba, as a result of a series of infiltrations which may have lasted many, many years.

This migration appears to have originated as a tribal wave somewhere in Ethiopia, and to have eddied down to the less disturbed waters of indigenous Bantu life as it then existed west of Lake Victoria.

“On the north and west of Lake Victoria a series of people—the Ganda, Nkole, Toro and Nyoro of Uganda, the eight Haya tribes of Bukoba district in Tanganyika and the Ruanda of the Belgian Mandated Area—have arisen from the conquest of Bantu agricultural people by Hamitic pastoral invaders from the north, which is believed to have occurred not more than three hundred years ago.”⁽¹⁾

We gather that these invaders came originally from Abyssinia; that they had broken away from the parent stock to form a separate people called the Galla who became very powerful and ranged, as semi-nomad tribes, throughout the desert country immediately south of Abyssinia, from the Sudan to the Indian Ocean, raiding and devastating until famine and internecine wars drove some of the tribes and their vast herds to seek a more leisured existence further south among the negroes of Central Africa. Fragments of the main body settled for a time in Bukendi which lies north of Lake Victoria on the right bank of the Nile, but receiving no peace from the hostile Nilotic inhabitants of that area, they crossed the Nile and grazed their way west, across the rich pasture lands of Bunyoro, until held up by the forests of the Congo, whence they turned

south and proceeded with but little opposition from the Bantu Pygmy population to somewhere in the region of Ankole.

There they founded the first of the Hima kingdoms in Uganda, and called it Kitara. They intermarried with the native people and prospered exceedingly, gradually extending their sovereignty over all the land lying between the Congo forests and Lake Victoria, and between the Nile marshes on the north and the Kagera river on the south, and southward beyond that again to embrace the country now known as Kiziba in Bukoba district. Dissensions in the Royal Family caused the younger members to flee with their followers to the extremities of this far-flung kingdom, where they established themselves peacefully as hunters and such-like and in course of time intrigued themselves into power, forming the independent chiefdoms in which we find their successors to-day.^(2, 3, 4)

We know that these Hamites introduced much that was new to the negro population, including ideas of organization, new weapons, planked canoes, the long-horned straight-backed cattle, dogs, crops, and in all probability the coffee which had been in use amongst their own people for generations, for we must remember that Ethiopia is the acknowledged home of coffee.⁽⁵⁾

The existing aristocracy in Bukoba traces its ancestry back to the kings of Bunyoro, in the Western Province of Uganda, but Bunyoro was once a part of the original kingdom of Kitara and it is here we find, hidden away behind veils of folk-lore, some glimmer of the truth which, in conjunction with certain established facts of those early times, provides a framework on which to build up our local historical record.

TRADITIONAL REFERENCES

According to Nyoro tradition there was a kingdom north of Bunyoro ruled by the Kings of the Bachwezi clan. One of them, Nyamionga (King of Hell), offered blood-brotherhood to a certain Isaza Nyakikoto, King of Bunyoro, sending him a present of two coffee berries. The connection became even closer by the marriage of his daughter, Nyamata, to Isaza and of this union a son, Isimbwa, was born whom we find regarded as a Muchwezi.

In later years Isimbwa undertook a hunting expedition to the south. He makes his appearance on the plateau lying between Lakes Albert, Edward and Victoria by arriving at Bukendi (North Buganda) in search of game. From there he went to Bunyoro accompanied by a servant, Nyamitale, and it is related of both these men that they were in the habit of chewing coffee. He remained in Bunyoro and married Nyanamwiru, the daughter of Bukuku who had usurped the throne of Bunyoro during Isaza's absence, and after much intrigue resulting in civil war their son, Ndahura, gained the Drum of Royalty, thus becoming the first king of the Bachwezi dynasty in Bunyoro.

Ndahura fought successful wars with the north, and on several occasions his warriors were sustained entirely by coffee berries in the devastated and foodless deserts in which he operated and through which he had to pass. Realizing the immense importance of coffee as an "iron ration" he had it

planted at Bugoma and Kijura (Kyabaranga Mwenge), and it was also planted at the time by his brother Kyoma at Muhwala (Kyagwe). It is to these early leaders of the semi-nomad tribes of East Central Africa that we are indebted for the introduction of coffee. It was their appreciation of the stimulating and sustaining properties inherent in the coffee bean that led them to use it as a concentrated and easily portable food supply. Of its early use for this purpose we read :—

“Bruce in his *Travels to Discover the Source of the Nile*, informs us that the Gallae were a wandering African nation, who, during their journeys into Abyssinia, travelled over vast deserts, and that the only food that they carried consisted of coffee berries . . . roasted and pulverized . . . which were mixed with grease, rolled into balls, and carried in leathern bags. Each ball . . . the size of a billiard ball . . . would sustain an individual for a day, when on a marauding incursion or in active warfare, better than a loaf of bread or a meal of meat, because it cheered his spirits in addition to feeding him.”⁽⁶⁾

Ndahura was succeeded by his son Wamala who during his father's lifetime had been sub-chief of the Buddu province of Bunyoro, which then included two of the divisions of the present Bukoba district, namely Missenyi and Kiziba. Wamala in continuation of his father's policy had coffee planted at Buiru (Buddu) and at Kiziba in Bukoba about A.D. 1600.⁽⁷⁾ By gift from the chiefs it was planted by the nobles—the Bahima, tribal followers who had accompanied the chiefs in their migration south. Speke writes :—

“In the earliest times the Wahuma of Unyora regarded the lands bordering on the Victoria Lake as their garden, owing to its exceeding fertility, and imposed the epithet of Wiru, or slaves, upon its people, because they had to supply the Imperial Government with food and clothing. Coffee was conveyed to the capital by the Wiru . . . Now Wiru in the northern dialect changes to Waddu in the southern; hence Uddu, the land of the slaves, which remained in one connected line from the Nile to the Kitangule Kagera until eight generations back.”⁽⁸⁾

TRADE

In the course of time as the yield from the early plantings in Bukoba increased and supplies in the hands of the chiefs accumulated, coffee in a non-viable form began to be traded into the territories to the north—Ankole, Bunyoro, Uganda and the Sesse Isles—in exchange for cattle which increased and, it is estimated, attained by 1862 the astounding figure of approximately four hundred thousand, or seven cattle per head of the estimated adult population.⁽⁸⁾ It may at first sight appear strange that coffee from Bukoba should have found a market in areas which themselves produced it. The reason lies in the local method of preparation which, though in principle similar to that in the north, had been influenced by the Arab ivory and slave traders operating from Dar es Salaam and Tabora. They had introduced the use of spices which they employed in the preparation of coffee in their own country,

thereby making the finished product much more palatable without losing any of its intrinsic nutritive qualities.

"The Arabs of Yemen abstained from the use of coffee as prepared from the roasted and ground seeds in the present European and American fashion; but they powdered the sun-dried pericarp and prepared a favourite beverage called Kicher, Gichr or Qichr which was aromatized with ginger and other spices. . . . Turks and Persians boil their coffee with a little Badiana, a species of anise . . . Others added two cloves cut into pieces, cinnamon, cumin seeds, or some cacouleh, a seed of cardamom."⁽⁶⁾

In Bukoba these spices were replaced by indigenous scented and sweet herbs of the *Ocimum* and *Coleus* varieties, to which were added the roots of certain plants (*Sapium* sp., *Butyraspermum* sp.) which gave the coffee a bleached appearance.

Trade with the Sesse Isles was particularly active and continued so until 1901-02 when sleeping sickness in the islands forbade further intercourse with the inhabitants, and it was from this source that several other forms of the *Robusta* species of coffee were introduced into Bukoba and planted both in the interior and throughout the coastal belt.

RELIGIOUS ASSOCIATION OF COFFEE WITH THE BACHWEZI

With this quickening of Bukoba's economic life Wamala's fame grew, and through the coffee introduced by him—his seed—his name eventually came to be associated with all the subsequent prosperity, productivity and fertility of this land and its people. During his reign he had extended his sovereignty beyond Bukoba as far as Uzinza and Biharamulo, and in that period the temporal power of the Bachwezi had reached its zenith. After his death they had ceased to exist as a ruling family but they had become venerated as culture-heroes, till in due course Wamala developed into the God and Sovereign of the universe, supreme in the hierarchy of the spirit world. He was believed to preside over every aspect of life. He was feared, venerated, loved, and his power has persisted even to the present day, for he still has ardent worshippers among the last of a generation unaffected by all Christian persuasion, who continue the ancient rites in acknowledgment of his sovereignty. It is these followers who provide us with our all-important link with the past.

The principal religious observance is that which takes place at the first sign of the new moon. The head of the house takes coffee prepared for chewing, and presenting it on an undamaged leaf of the castor-oil tree places it before Wamala's shrine inside the house, where it is left until the following morning. This offering is accompanied by an invocation beginning "*Kaboneke Waitu, Kaboneke Rugaba!*" and entreating the blessings of health and fertility and deliverance from all evil.

Coffee is similarly offered at the shrines of other powerful Bachwezi, as, for instance, Mugasha the Guardian of the Lake, Irungu the Guardian of the Soil, and Lyangombe the Guardian of the Cattle, whose shrines are all situated outside the house.

MISSIONARY RECORDS

It is recorded by the first arrivals of the White Fathers' Mission in 1892 that at that time coffee belonged to the chiefs alone, and that such coffee trees as were found in individual native gardens had been planted by the chief's orders, were regarded as his property and were maintained by the occupier of the plot for the chief's use. The crop was collected and treated by specially appointed men called the Wabona, who then took it to the Royal Presence. On receiving coffee and prior to eating any himself, the chief would distribute some with his own hands amongst those in attendance upon him, in order of precedence.

That coffee was regarded as a royal crop of which the common people were unable to partake except by royal favour, by gift from the chief, is borne out by the absence of any considerable number of really old trees to-day. Here and there a tree may be found of an age well over one hundred years, but the bulk of the older coffee in the native gardens averages no more than thirty-five years, which corresponds with the first awakening to the economic possibilities of this crop and the measures for increased planting initiated by the German Administration in 1903.

SUMMARY OF HISTORICAL EVIDENCE

Combining these various facts—that coffee was a royal prerogative, the crop being presented to the chief by any who cultivated it, and that offerings of coffee were made and are still made every month to Wamala—we may reasonably assume that Wamala was the first of these northern immigrants to be acknowledged as ruler in Bukoba and that it was he who introduced the coffee, otherwise we should expect to find one greater than himself receiving this oblation from a tribe of ancestor-worshippers inclined to deify their powerful chiefs. We thus see that the proposition that coffee was introduced into Bukoba and is not truly indigenous there finds support in tradition, folk-lore and religious observance. These considerations would hardly, however, by themselves be a sufficient basis for any definite conclusion, but we have other evidence all pointing in the same direction.

BOTANICAL CONSIDERATIONS

In a small patch of forest known as Kantale, in the chiefdom of Kiziba which was once a part of the Buddu province of the Kingdom of Bunyoro-Kitara, there is to be found a *Robusta* coffee, a form of *Coffea canephora*, which is now known as *Bukobensis* and which has been the source of most of the earlier plantings in northern Bukoba. In none of the other blocks of forest in the district is there any trace of *Robusta* coffee except as an obvious escape from existing plantations, and this particular patch of forest lies near the Uganda border in the very middle of a closely settled area. Nyoro tradition states that coffee was planted in Kiziba by Wamala. Local tradition, on the other hand,

ascribes its planting in Kantale to a local ruler, but this apparent confusion is readily understandable since the peasant would naturally associate the coffee with the man who actually supervised the planting rather than with the distant king.

Coffee is to be found in a similar "wild" state in two of the forests of Buganda and is discussed by T. D. Maitland, Government Botanist, Uganda, as follows :—

"*Coffea Robusta* has been found in the Congo and the Gaboon, these localities are no doubt the natural home of the plant . . . It extends to the Forest of the Semliki Valley and to the Forest of the West Province where it is exploited by the natives. It is doubtful if it is indigenous to the Forest of Buganda proper. I know the tree is to be found in Mukuno Forest in Kyagwe and in Bowa Forest in Bulemezi. I have seen the trees in both forests and they seem much too localized and too near habitation to indicate a wild habit. They do now nevertheless exist as wild plants." (9)

This statement might equally well apply to the so-called wild coffee in Kantale, and in conjunction with the tradition that it was in fact originally planted gives us a very strong argument in favour of the contention that the coffee tree in Bukoba is not a native of the area. That it has characteristics differentiating it from other known forms of *Coffea canephora* is not extraordinary considering the many years it has been in the district. Environmental influences of soil and climate have doubtless had their effect in producing the superficial changes peculiar to *Bukobensis*. R. H. Cheney⁽⁶⁾ comments on the extremely variable nature of *Coffea canephora* Pierre ex Froehner and says that :—

"As many as nine varieties have been described. Pierre recognized and described seven of which I believe only one is distinct enough in its individualistic composition to warrant description as a separate economic form at the present writing."

A wild plant found by H. Gillman in the Kaigi Forest at Buembe, Nyakato, Bukoba, has been identified by Kew as a coffee species near *C. eugenoides*. As, however, it is one of the uneconomic forms of the coffee family and is related to the *Arabica* rather than the *Robusta* species, it does not affect this history.

PHILOLOGICAL CONSIDERATIONS

Further evidence supporting the theory that coffee was introduced into Bukoba is to be found in the local names given to the plant and the crop, *mimwani* and *mwani* respectively, both of which are in use in Bunyoro, and it may be noted that a wild plant resembling coffee and found in the forests of the Bukoba district—*Oxyanthus speciosus*—is called *mimwani kibila* meaning coffee of the forest. Furthermore, the different forms of coffee, with the exception of one known as *mibona* and described later, have no names of their own but are called after the local varieties of banana : *nshansha*, the close-clustered ; *nshakara*, the long ; *beri*, the bitter ; *ntobe*, the short and fat ; and so on.

ORIGIN OF BUKOBA COFFEE

Having traced the introduction of coffee into Bukoba from somewhere north of Bunyoro, we have now to ask where, in fact, it did originate. We must consider the known sources of the *Robusta* species in East Central Africa and examine each in relation to our history as we know it.

Botanists are agreed that this species is a native of the forests of the Congo, from which it has spread into the Semliki Valley, of the forest south of the Sudan and of the forest lying in the south-western corner of Abyssinia. We have no information regarding any early use of coffee in the first two of these three areas; its exploitation by natives now inhabiting them is of very recent date.⁽¹⁰⁾ These two areas were protected geographically by mountains which separated them from the plains across which marched the northern pastoral invaders in their migrations south, and it is more than probable that the newcomers remained unaware of this boundless source of supply to the west, bringing their coffee all from the one area which they already knew—the forests of south-western Abyssinia.

THE PROPAGATION OF COFFEE

In Bukoba it would appear that vegetative propagation was practised up to the year 1900 when Emin Pasha, as German Resident in the area, had coffee nurseries planted near the military station and so introduced the method of generative propagation.⁽¹¹⁾

The original practice was a system of layering by means of which a branch would be bent down and pegged into the soil where it eventually took root. Once it had established an independent root system the branch was usually severed from the parent stock to form a separate tree. Sometimes, however, it was left and then together with the original tree it developed into an amorphous growth straggling over a considerable area. A few of these trees are still in evidence, their age unknown, producing crops which in quality and quantity is equal to the yield from trees planted several generations later.

A second and less common method was to take a branch as a cutting and plant it with both ends in the ground. When the two ends took root and threw out young shoots the branch would be cut in half leaving each end to established itself separately.

It is not altogether clear why coffee was not propagated from seed, but it must be remembered that the number of trees was very limited owing to the royal monopoly and that the whole crop from them was used for making chewing coffee, for which purpose the beans were picked before they ripened. For this reason there would be very little mature seed falling to the ground and thus few seedlings. Furthermore, cuttings would crop much earlier than seedlings and would probably be preferred on that score.

Local superstitions regarding coffee trees are also suggestive in this connection. It was held until comparatively recently that if a man himself planted coffee in his own shamba he would not live to see the crop, and that

should a coffee tree die the man who planted it would not long survive it. These superstitions very possibly arose out of the peculiar social status of coffee, which was jealously guarded by the privileged. When a man was ordered or permitted by his superior to plant a coffee tree, he would receive a branch from some particular tree whose owner could thereafter be held as a witness regarding the source of supply. This branch would be actually planted by a friend, a second witness. Planting was thus rigorously controlled, and it is probable that to be found in possession of coffee or to have it growing in the shamba without evidence as to its source and proof of permission to plant entailed severe penalties, very possibly the death penalty, since the offender would be treading on royal preserves. In the circumstances it would not be difficult for the idea of unfortunate consequences to become associated with the planting of a coffee tree in one's own shamba. Moreover, generative propagation would be discouraged because, coffee trees being few in number and each a much prized possession, it would not be easy for a man to cut a branch from one unnoticed, and so anyone rash enough to risk planting coffee unauthorized would have to look for a chance to steal a stray seedling, thus tending to the association of generative propagation with lawbreaking and danger.

The second superstition probably arose out of the fact that only the old and tried followers of the chief were allowed to plant coffee, so that in most cases the planter would die long before his coffee and, if a tree did die prematurely, its planter being an old man did in fact not survive it very long. The idea of a connection between the death of a coffee tree and the death of its planter would thus easily arise in men's minds and would act as an additional supernatural sanction against any surreptitious planting, besides weighting the scales in favour of planting cuttings which, once established, were less liable to die than seedlings.

LOCAL PREPARATION OF MASTICATORY COFFEE

We now come to the preparation of coffee in Bukoba which, except for the addition of herbs as already described and the fact that the berries are picked before they ripen, shows no change in method from that recorded of the Hamitic progenitors of the local aristocracy and described in *All About Coffee*.⁽¹²⁾

"Research shows that perhaps as early as A.D. 800 this practice started by crushing the whole ripe berries, beans and hulls, in mortars, mixing them with fats and rounding them into food balls. Later the dried cherries were so used. It appears that boiled coffee (the name is anathema to-day) was invented about the year A.D. 1000. Even then the beans were not roasted. We read of their use in medicine in the form of a decoction. The dried fruit, beans and hulls, were boiled in stone or clay cauldrons."

Preparation is in the hands of the older men only, who are very particular indeed regarding the cleanliness of the pot used and keep a special narrow-necked clay cauldron for this purpose. In a village there may be perhaps three or four of these pots which go the rounds and are borrowed as necessity arises.

Any one of the several forms of the *Robusta* species of coffee may be used, but not *Arabica*. Preference, however, is given to that which produces a large round cherry which, when ripe, becomes a golden-yellow rather than the normal red and is known for this characteristic as *mibona*, a name derived from *mabona*, a small round creamy-yellow fruit of an egg-plant variety. The coffee is collected when the bean is fully developed but before the cherry is ripe. It is placed in the pot together with the herbs, being sandwiched between three layers of herbs—herbs first, then coffee, then herbs, then coffee, then herbs again—to within a few inches of the mouth of the pot. In some areas where herbs are scarce the middle layer may be dispensed with. Water is now added and the pot set on the fire, which is maintained for twelve hours. As the water in the pot evaporates it is replenished, failure to do so resulting in smoked and discoloured beans of unpalatable flavour. After twelve hours the process of cooking is complete and the pot is taken outside, the water and herbs removed, and the coffee transferred to a basket where it is left to drip. It is later spread on a mat and kept in the outer compartment of the house to dry. From there it is removed to a platform erected over the hearth and smoked. Special woods are used for this purpose, *minazi* (*Parinari* sp.) and *mushasha* (*Sapium* sp.) being those principally favoured. These are used alone for the first day only, thereafter, that is for the next five days, they are used together with the stems of a tall reed called *mishanji*. On the sixth day the coffee is returned to the basket and scrubbed clean with tufts of grass. It is then replaced over the fire and the smoking continued for another two days, when it is thoroughly scrubbed in the basket as before except that in place of grass dried *kalaza* (one of the scented herbs used in the cooking process) is used in this final cleaning. The coffee is then put away ready for use.

It has a minty flavour, quite pleasant, but it is as hard as a stone and not too easy to chew. Too much of it is liable to upset the digestion, but taken in moderation its invigorating, sustaining and stimulating properties are indisputable.

TRADITIONAL DOMESTIC OBSERVANCES

As propitiatory offering, coffee prepared in this way figured prominently in all the spirit houses of the deceased members of the family and, without fail, in similar shrines built to propitiate the spirits of the more powerful Bachwezi. In cases of prolonged, repeated or acute illness in the home, Wamala's shrine within the house would be supplied daily and in addition handfuls of coffee would be cast north, south, east and west, inside the house and outside as well, with prayers to the spirits of the dead to have mercy and to remove the curse of ill-health. The traveller on returning from a long safari had to give due warning of his impending arrival in order that the presiding spirits might make ready to receive him. A messenger would be sent ahead and the parent or wife would stand at the door awaiting the approach of the absentee. When he came in sight coffee would be cast as in sickness, but on this occasion it would be an expression of thanks to the ancestral deities. On reaching home

the traveller would be given coffee at the door and, as he entered, he would cast it before him into the house with an expression of gratitude for his safe return, at the same time asking for the blessings of health and fertility now that he had come home again.

BLOOD-BROTHERHOOD

By far the most important function of coffee in the social life of the native was its use in the ceremony of blood-brotherhood. At a time when men's lives were subject to the whim of autocratic rulers and those in authority under them, all people sought the protection conferred by this institution, which provided them with some chance of escape through the timely assistance of blood-brothers in a position to convey information regarding impending danger. A blood-brother was considered as one of the family whose members had to protect him as one of their own blood. Chiefs sought the relation with chiefs; nobles sought it amongst themselves and with their chiefs, and the humbler members of society bound themselves together by this means for mutual protection and sought the honour of this relationship with those in the social scale above them. The coffee seed with its twin halves bound together within the outer covering, which was taken to represent family obligations, was the ideal symbol for the purpose.

The ceremony was conducted as follows. The two men would stand stripped to the waist on a sheet of bark-cloth representing the home. An elder of the tribe, called in to officiate, would admonish and instruct them in the implications of the ceremony and the obligations undertaken. He would then make incisions in their navels, drawing blood, after which, taking a whole cherry, he would extract the twin halves of the seed and give one to each of the participants who would smear it, each with his own blood, and place it in the palm of the other's hand. Having vowed to regard one another as brothers of the same blood, they would then swallow the coffee. In the event of either failing to keep his pledge the aggrieved party would appeal to one of the *Bachwezi* spirits, and it was believed that the wrongdoer would be afflicted with a distended stomach which would ultimately burst. To prevent this awful calamity, he who had failed in his pledge would seek the forgiveness of his blood-brother by taking coffee, a goat, a few cowries, at one time the only currency in the district, and a piece of bark-cloth, and presenting them at the shrine of the spirit invoked by the aggrieved party he would say : "I have wronged my brother and am deserving of the punishment with which I have been afflicted; but I admit the wrong done, and offer these gifts in propitiation of my sin. Accept this my oblation and return to me my health."

His blood-brother, who would be present at the time, would then take the coffee offered and casting it about him would address the presiding spirit thus : "This brother of mine has admitted the wrong he has done me, and vows that in future he will be true to his pledge. I beseech you now to remove your spell and to make him well."

COFFEE IN PRESENT-DAY SOCIAL LIFE

When friend meets friend coffee is exchanged and, in entertaining guests, it is invariably offered before all else. Done up in fancy parcels of banana fibre, the women take gifts of it to their lovers, such presentations being known as *urutwa* or *rushansha*. When conveyed as gifts to girl friends or to their parents, the coffee is presented in artistically decorated baskets and known as *ntukuru*. The chief's coffee, prepared only by his own men, the Wabona, is known as *mbona*, and that prepared for the nobility as *ndimurungi*. Coffee prepared for the use of the common people is known as *mwani*. Friends visiting the family on the occasion of a death in the house are entertained with coffee. When a girl is married, her father visits her ten days after she leaves her home and takes with him a gift which includes coffee. On arrival at his son-in-law's house, the visitor is presented with coffee. Having distributed and consumed this, he in turn presents his own gift of coffee, after which ceremonial exchange of compliments the ordinary business of the visit can proceed. No man, particularly among the older men, will leave home in the morning without a fistful of coffee. It is said to stave off hunger, keep off thirst and counteract the too rapid effects of alcohol. I am informed that natives from Bukoba employed as porters during the war were known to have bartered their wives, their daughters and even their birthrights for a handful of chewing coffee. Small packets wrapped in banana fibre, containing about thirty cherries, are a feature of every marketplace and find a ready sale at two cents a packet.

CONCLUSION

With the passing of the older generation all the ancient customs are fast dying out, and but few to-day are acquainted with the old associations of coffee and its traditional ritual uses. Tradition continues to associate the introduction of coffee into Bukoba with past rulers, but the Bachwezi to whom the credit for this introduction is due and who, for generations past, have received honour in recognition of this benefaction, are to-day rejected as mythical beings, the malignant devil-gods of a disreputable pagan yesterday. They are no longer a force in the land, but the coffee they brought with them remains to punctuate social intercourse among the people they once governed, and so to perpetuate their memory.

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Anthropological Notes from the Zanzibar Protectorate

By Muhammed Abdurahman

Introduction — Circumcision — Female Initiation — Education and School Life — Marriage — Daily Life — Domestic Life — Life in a dhow — Arts and Crafts — Etiquette — Black Magic — Miscellaneous — Death — Swahili Cradle Songs and Songs of Circumcision

INTRODUCTION

DURING my many visits to the various rural areas in the Island of Zanzibar I saw and heard many customs of the people which immensely interested me. When I was stationed in villages as a schoolmaster, I tried to learn more of these customs, and I noted down many for my own personal interest. Lacking a scientific background, I wrote my notes at random and thus they lay for about four years. Luckily for me, through the great kindness and keen interest of Miss Nicol Smith, Curator of the Zanzibar Museum, I was loaned the anthropological guide book, *Notes and Queries*, and thus arranged the material in a better way.

The average native is very suspicious, especially to Europeans and government officials. Although he himself is inquisitive, yet if he finds another man, a foreigner in particular, inquisitive he tries to misinform him. If one wishes to note down anything of interest in the native customs one should not do so in front of him. As there is no doubt he will give some incorrect information. Direct questions will have the same effect.

While collecting various customs I had to show that I sympathized with them especially with the magic beliefs. A native is very much annoyed to find his beliefs ridiculed. I learnt some while in conversations, some when visiting their homes and others by asking questions. Some of my school pupils, too, helped me in collecting a lot of the information. Being an Arab and a Muslim there was not much difficulty in getting on well with them.

The natives of Zanzibar Protectorate are divided into four classes:—

1. The Wahadimu who live in large villages of the east coast and also on the coast in the extreme north and south of Zanzibar Island.
2. The Watumbatu who are settled in the Island of Tumbatu, about three miles north-west of the main island.
3. The Wapemba who inhabit the sister island of Pemba.
4. The Waswahili who are the outcome of the mixing of Arab and African coastal peoples from early time. They live in towns and in suburbs. Many have scattered along the west coast of the Zanzibar Islands. As I have never lived either in Tumbatu or Pemba I have not attempted to write about their customs. So the customs which I shall describe are those practised by the Wahadimu and the Waswahili, though some of them are practised in the other two islands.

With the coming of European ways and ideas into the villages and the influx of pagan or Muslim or Christian mainlanders many native customs are ebbing away. A young man who has been to school or has had long town influences finds himself ridiculed for adhering to his own customs. He is told they are primitive. He unconsciously gets the impression that if he leaves his own customs he will become Europeanized. He does not realize that even the white man has his own customs which he cannot leave. In this way the young villager drops his own customs, some of which are quite good, and tries to imitate the European ones most of which are expensive. He will ultimately find himself nowhere. The most pitiful thing of all, to me, is the ebbing away of the knowledge of native medicines. I have no doubt that when some of them are investigated scientifically they will be found of great use.

In such a way, then, the native customs are fast disappearing and if they are not recorded immediately they will get mixed up with the mainland ones, as many are at present, and will not be of great scientific value in the near future.

Perhaps the most interesting fact which emerges from the study of the native mode of life in Zanzibar is the effect of culture contacts. It will be seen in the following pages that there is a welding of Arab, that is Mohammedan, customs with practices which are purely African and the reverse.

I may add that the following notes are not in the least exhaustive.

BIRTH AND CHILDHOOD

When a pregnant woman is about to deliver, a midwife is summoned to receive the child. On such a day the expectant mother lies on a low wooden bed. Some, when about to deliver, are seated on a low stool and sometimes they may be seated on wooden mortars. Then the midwife is ready to perform her duties. Usually the mother's parents consult a fortune-teller to foretell whether the delivery will be successful.

When a child is born women clap hands and shout rejoicingly. Immediately after birth before it is washed it is kept on the floor and its mother says ; "Oh, it is you who have been troubling me. O ! O ! you child." The aim of saying these words is that when other people cast evil eyes to it, it will not be affected as its mother has already cast evil eyes on it and they have not harmed it.

There is also another custom when the child has been born. Many people lay the child in a winnowing tray which is put on a threshold and the mother comes and jumps very slowly indeed seven times over it. Then a pestle is lightly kept on the child's throat and the mother says : "Press, press." This aims at stopping the child from being greedy as it grows up.

Sometimes the mother takes her right big toe and sets it lightly on its throat and says : "If you see someone's belonging you must not covet or need it." That is, it should not be covetous when it grows up.

The umbilical cord is cut immediately after birth with a sharp razor ; but it is not completely cut. Only the mark of a cut is made and then the cord is tied with a black thread the other end of which is tied round the child's neck. When the cord dries it drops down by itself. But care should be taken lest the cord falls on the child's urine otherwise the child may be a bed-wetter at night when asleep even when it is grown up.

After a child is born a Sheikh or a religious person is summoned to repeat the Mohammedan call for prayers at the child's ears. When doing so he holds its right ear first and then says the call to prayers very slowly. After that he does the same with the left ear.

It is believed that a child who has never had "prayers" repeated in its ears becomes very troublesome and does not listen to its elders. That is the reason why one hears people telling a child ; "Look at that child as if he has never had the prayers call said in its ears, because of its troublesomeness."

The child stays in for seven days, and in the second week it is washed daily every morning and afternoon, with *jimbo* water (*jimbo* is a root of a certain plant). This kind of bath is continued until it can walk or even run. It is smeared with coconut oil every day and also warmed and frankincense burnt before it.

After the seventh day it is put in a winnowing tray and taken to be shown the sun. There, then, water is taken and thrown over a roof and when it drops down people say, "Rain, rain." Then seeds of seven kinds are planted along the drain of the rainwater from the roof.

After seven days an amulet called "an amulet of Yasin" (a chapter from Quran) is made and tied round the child's neck. It is done so that it may not be harmed by bad people or jinns or devils. The amulet is not removed unless the thread gets cut by itself. If it cries very much a special amulet is given to be worn round the neck.

The majority of children are given names on the seventh or fortieth day and when they are found to be crying very much. But some are given such childish names as *Bwanamkubwa*, *Bimkubwa*, *Ubwa*, *Hababuu* (usually an Arab), etc. Common names among the Wahadimu are : *Fum*, *Makame*, *Haji*, *Simai*, *Usi*, *Vuai*, *Pandu*.

On the fortieth day "Maulidi" is recited and the child's head is shaved by any village barber. The hair is buried in a damp place near the sea-shore beside a water-pot. It is believed then that the child's head will not be dry. Cotton-wool soaked in butter or coconut milk is put on the crown of its head. Some people shave the child's hair after three months and the hair, sometimes with the umbilical cord, is buried and coconut is planted on it. Others tie the hair in a cloth and keep it on the roof just above the kitchen.

The umbilical cord is buried and usually a coconut tree is planted on top of it. When it bears it is the child's own property, and the crop is his own too. It is considered to be ill luck if it dies before the tree bears. This custom applies to girls as well as to boys.

There are certain mothers who are unfortunate enough to have children who die after birth. Such mothers, in order to safeguard future children, prefer to sell them so that they may become "slaves." On the seventh day when the child is taken round to be shown the sun (*kuona jua*) the midwife carries it to the neighbours to whom she says such words: "Oh people, a child for sale!" If the owner of the house wishes to buy it he or she says the price, anything from shillings thirty to one hundred. If the midwife agrees to the price then the child becomes a slave of the buyer. In reality the purchaser does not pay a single cent out of the price he or she fixed. He or she pays the broker's fee, that is the midwife's, which is normally only three shillings.

It is believed then by selling them they will live longer. Such children are usually called by the names of *Mtumwa* (slave), *Kitwana* (a small slave) and *Matwana* (a big slave).

After the child has been bought her master or mistress looks for a black fishing line which, when found, is tied round its neck and hip. It is its duty to go every Friday to serve the master or mistress and he or she gives it five cents or anything. During the Mohammedan festivals—Id-Alfitr and Id-Alhaj—it is given the best clothes by the purchaser in order to show that it is loved.

That thread is not cut until it is married. When about to be married the purchaser must be informed first; and on the day of the marriage the purchaser is given a certain amount of money called *Kilemba cha mtumwa* (the turban of the slave); and then the thread is cut. Sometimes when the slave wishes to be "freed" at any time a load of firewood is sent to the slave owner.

This custom of selling the children is thought protective probably because the mother's devil will not harm it as it is no longer hers. (A devil who haunts the mother is supposed to be the cause of the children's death.) It is said that certain women promise their devils to give them a gold or silver ornament, usually a ring, or hold a certain devil-dance in their honour. When the promise is not fulfilled then they torment them by killing their children or making them unwell every now and then. A toothache is sometimes believed to be caused by a devil.

The work of rearing and feeding children is usually the mother's but if there is a grandmother the work is left to her. Normally grandmothers love very much to rear their grandchildren. It is a rare thing for a child to be reared and fed by someone else, but immediately after the child has been weaned, some parents do give their children to other people as they are assured that they will be fed and clothed. These children are not sent back home until they are about to be married, if they are girls.

At the time when the child is weaned—about two years—the mother puts the juice of the aloe plant (*shubiri*) on her nipples so that the child may taste the milk bitter and it may thus refuse it. Some mothers put salt or even rub chillies on the nipples.

When the child wishes to sleep it is usually kept on the mother's lap or carried on the back supported by a *khanga* tied on the mother's chest. At the same time the mother sings beautiful songs. But if it is very young it is merely kept on the lap. The songs, because of the beautiful voice and nice words make the child sleep quickly. Some of these cradle songs are printed below.

SWAHILI CRADLE SONGS

- No. 1. Kangole ngole mwanangu
Mwanangu nakuchombeza,
Ukilia waniliza
Wanikumbusha ukiwa,
Ukiwa wa baba na mama
Baba na mama katenda
Kunioza dume kongwe,
Halisafiri halendi
Kazi kupiga matonge
Likiingia mivunguni
Huvunja vunja vikombe
Likilala kitandani
Languruma kama ng'ombe,
Ooooooh mtoto Ooooooh.
2. Kile kidau kijacho
Hamkosi mna changu
Mna mkufu nitunge
Kadiri ya shingo yangu
Siuvai siutupi
Wala simpi mwenzangu
Tampa mama shangazi
Msiri wa kunga zangu.
3. Kangole ngole mtoto
Mtoto mla tototo
Ukila ubwabwa umoto
Kitumbo cha fuka moto.

CIRCUMCISION

Circumcision is obligatory to every male Muslim, so every Muslim boy must be circumcised. When a boy attains the age of eight or ten years he is ready for circumcision. Muslim girls have their ears pierced: in fact even boys have their ears pierced, one hole in each ear, believing that by doing so they will not suffer from nervous ailments. This custom is common even among the Arabs. The writer himself had his ears pierced.

When a boy is ready for circumcision he usually must wait until a number of boys are ready so that they may be circumcised together. When a sufficient number of boys are ready a shed or fence near a house is built. It is usually

called *kumbi*, meaning a porch. Then the circumcisor hangs a bag of medicine to stop evil people from doing harm to the boys during their stay, or also lest his work should be spoilt by being harmed by other medicine-men or even his fellow circumcisors.

Before all this all the parents should agree to the quantity of food and clothes of the children. Also they have to decide about the circumcisor's fee, which is usually three shillings for each boy. Then some people look for a man who is to stay with the boys during the ceremony and that man is called *kungwi* (nurse); some people do not keep a *kungwi*, but the boys' parents themselves become the *kungwi*. When they have agreed to all these things then they are ready to announce to the neighbours and far distant relatives about the ceremony.

The usual circumcision hour is very early in the morning, before the sun rises. Some people do it in the evenings, but not very many.

When the ceremony is about to start a wooden bed (charpoy) or a low stool is brought on which the boys are seated one at a time. The boy's face is either turned or covered, and then the circumcisor catches hold of the foreskin and cuts it with a sharp knife (specially made) or a razor. After the foreskin has been cut and the medicine has been applied he is taken and is seated on a section of banana tree trunk. Then he is given a very young coconut to drink so that he may pass urine. The first boy is usually known as *kiranja*, among some people in the north of Zanzibar. The food given during their stay is usually a not properly cooked rice, known as *bondo*.

Normally the boys are made to sleep on mats on the floor with banana trunks on the either side. On the ends of the trunk, one on each, sticks about a foot or so high are kept. The legs are set apart so that they may not touch the wounds. Even the clothes for covering their bodies have their ends tied to the stick, and when they wish to cover themselves they simply pull the cloth. This work is usually done by the nurse or the parents.

During those days they are taught various songs, mostly profane, in the morning and evening.

On the seventh day, if healed, they are taken out and rice is thrown over them so that bad people should not say that the boys have been ailing in the *kumbi*.

Some villagers, especially in the northern part of Zanzibar, do this on the seventh day. A man with faeces on his posterior comes before the boys. He goes in front of each boy and bends with buttocks towards him and says *Mkubwa*. If the boy laughs the man looks for a coconut husk and makes him clean the faeces with it.

In the yard when the children want food or water they must do so by singing. For example, if they want water they sing thus: *Chura lia lia mdomo hauna maji*, meaning "Frog, cry, cry, the pot has no water."

When the boys are completely healed the circumcisor comes and instructs them in good morals and tells them not to indulge themselves in sexual inter-

courses otherwise their ulcers will reopen, and also they should not insult people or do anything bad to them.

By now they are ready to be taken out. On such a day there is usually a big feast and celebration. When they go out they wear new clothes, shoes, etc. Their faces are painted with lime and *wanja* (kohl). They have beads and silver chains across their shoulders, and thus being ready to go out they are covered with a *khanga* lest they should be coveted by the public. They are taken round to their respective relatives who give them a few coppers. The money is usually taken by the circumcisor.

Of course the majority of these customs are not practised nowadays. The present custom is to call a circumcisor who after cutting the foreskin goes away and leaves the work of curing the sore to a village government dispenser, or other modern circumcisors have a stock of Iodoform which they use in healing the sore. They are now ready to get prepared for youthhood and later for marriage. Songs of circumcision are appended.

SONGS OF CIRCUMCISION

- No. 1. Netumwa kiasi tugu
 Nachimba cha mnyelele
 Kizongozongo mabugu
 Ndani kina uchelele
 Ukikichocha hakigwi
 Kitunga mambelembele
 Kitamu sili na ndugu
 Jirani simtoche
 Kitiwacho sitarani
 Funga na lango komele.
2. Mtu kibuwa katumwa
 Katumwa shamba kaua
 Kala mkungu wa ndizi
 Na kuku kyumba kizima
 Mwacheke cheke mwa ndege
 Haiwa mwana haiwa
 Kwetu kuna mashindani
 Ya kurukia ngamia
 Kuna mafuta ya chawa
 Kombe kwa riali mia.
3. Sisimizi mbumbua
 Aliona lake jua
 Akapata uchanja akatua
 Nimeona kindi leo
 Limeze vua hata chua.

4. Howani mama howani
Kitunguu na ubani
Maji ya kaza kujaa
Hujaa kinyerenyere
Yakifika magomani
Kofi na vigelegele
Hooooowa mtoto.
5. Naona mastaajabu
Kukukuvaa viatu
Kwata akafika kwa watu
Akatoa shingo yake
Yapata ziraa tatu
Chini kwalia kigoma
Juu kwalia upatu.
Wari mwetwa Maskati
Kwa Rashidi mla watu.
6. Naona mastaajabu
Chupa kuingia mkono
Wakaingia Waarabu
Watu kumi na watano
Masiku kumi na mbano
Wewe ushike ujamu
Wakaingia Waswahili
Mimi nishike kiyamo.

THE FEMALE INITIATION

Every young girl has a *Somo* or female teacher. (She is sometimes known as *Kungwi*.) When the girl reaches puberty and her courses appear for the first time she informs her mother and female relatives who soon after summon the *somo*. On an appointed day the *somo* comes and washes her and later rubs her with simsim oil and the flour of sandalwood. This is known as *Kusinga*. Women are usually invited on such a day. After this simple ceremony the girl is known as *Mwari* and has to run away from all male people who can marry her.

For the benefit of young girls who are to be taught the sexual relations of men and women and behaviour and good manners towards their husbands when they are married, a special dance called *unyago* is held. It takes place either inside a house or in a fence built near a house. A girl who has never taken part in such a dance is not allowed in to see. She is usually known by the name of *Msungu*. As the dance is held while the women are in a state of nudity no male person is ever allowed to see it. In fact, woe betide a man who is found out peeping as they will beat him almost to death.

The songs are usually profane. The young girls or initiates are made to swear that they will never divulge any secrets of the guild; and then they are cursed by the leaders as a precaution against their giving out the secrets. I can safely say that these dances have been imported from the mainland.

EDUCATION AND SCHOOL LIFE

When a boy attains the age of six or seven, his parents think it time to send him to school. So they go to a teacher to bargain with him about the fees. The majority of the boys are sent to the Quran schools at the age of eight or over.

After the parent has fixed with the teacher about the fee he looks for a lucky day on which he is to send his son (in some cases the village fortune-teller is consulted). He believes that if he sends his son on the particular lucky day the son will *hitimu*, that is complete the whole Quran quickly and his intelligence will also be good.

On the appointed day the boy is clad with nice clothes and he is accompanied by his parents. When he gets to the school the parent pays a shilling and a half which is called *ufito* (cane) that is money with which the teacher should buy a cane or stick with which he is to punish the child. In reality the teacher does not buy the stick at all, but simply spends the money for his own personal use.

When a boy gets to the school he is seated among the fellow pupils on a mat or *jamvi* or a rotten piece of mat, and if there is none of these the boys themselves plait coconut leaves to serve as mats.

The child must come with a *juzuu* (a section of the Quran) and a board or slate to write on. If he does not bring the *juzuu* then he will learn the Quran on the board or slate. That is to say the teacher will write when necessary a *sura* (chapter) on the board so that the child may read until he is *hitimu*. There is no doubt that this is a difficult way. To begin with the teacher writes the chapter in pieces, and if the pupil understands one piece it is rubbed off and he is given another one and so on. When he wishes to revise he cannot do so as he has nothing to help him. So he is in great difficulty and no doubt it takes him a long time to *hitimu*. Also when writing the teacher might make a mistake and the pupil reads the mistake without knowing. The difficulty does not lie with the pupil only but also with the teacher, because it is rather tiresome to write slowly on the board.

In most village schools the boy is taught to write on Thursdays, before he goes home or goes to hoe the teacher's field. He learns to write on a piece of board specially made for this purpose and others write on the shoulder blades of animals, such as a cow. His pen is a piece of bamboo. He copies on the board or slate or bone the letters or words from his primer. The ink is the powder of the coral limestone. The powder is put in a coconut shell and then water is put in it to make it liquid enough to enable one to write with it. The boy himself has got to procure this coral powder.

At the beginning the teacher teaches a boy to hold a pen. Other teachers do not agree to do so until they are given a hen or some money.

After writing the boy goes to his teacher's field to hoe and to make furrows and all sorts of necessary pieces of work. But if the boy pays five cents to the teacher he is exempted from such work.

At first, every day he is taught the Arabic alphabet and later on words and then verses from the Quran. In some Quran schools if a boy reaches a certain *sura* he sends a certain present to his teacher. For example, if he reaches "Altin" he sends a *pugi*. They believe that a *pugi* reads that *sura*. ("Pugi" is the dove).

If the boy reaches "Alam Nashrah," the father sends a *shore* with the same belief as above. ("Shore" is the East Coast black capped bulbul or selgat). If "Al-Kureish" he sends a hen with a belief that it reads this *sura* on a hot day when it is alone basking in the sun.

Friday being a religious day to all Muslims the schools are closed so that the teachers may go to say the Friday prayers. On these days the boys have nothing in particular to do so they spend their time playing at home or under trees. Some go to the bushes to snare birds by *urimbo* (resin) or kill them by a *panda* (catapult). When they get them they roast and eat them there in the bushes.

The school hours are from seven to twelve, and from two to five. During the month of fast, Ramadhan, the boys go only in the morning.

On the night of the Persian solar year known as Nairuz they go to read Quran and sleep at their teacher's house. Every boy sends his share of food in money or kind. (Usually they are told the kind needed.) They go in the evening and sleep there until the following morning when they go to sea to bathe. They prepare their breakfast on the previous night, and at dawn the teacher's wife completes it by adding the coconut milk. Their breakfast may consist of beans and gruel.

To and from the sea-shore they read the following *sura* on the way: "Ashams," "Attin," "Alikhlas," "Alnajm," "Walayl," "Walfajr," "Almulk" and "Zilzala." One of the boys does the reading. He reads a little and then stops and when he does so the other boys say thus *Kombe chaza* (literally meaning the shell of the oyster). When tired of this they sing the following song:

Si letu si letu	It is not Ours, it is not Ours
La mwalimu wetu	It is Our teacher's.
Upanga na ngao	The sword and the shield
Na kalamu zetu.	And our pens.
Alfoli Bandarsalama or	Alfoli Bandarsalama or
Nasrun minallahi.	Help from God
Kamkosa mshare.	He missed him with an arrow.

When they get to the shore it is compulsory for all to bathe. If a boy refuses to do so on the ground of feeling cold he is beaten or thrown into the water. The teacher himself bathes.

By the time they get to their teacher's house the breakfast is ready and they help themselves to it, and later disperse homeward. Some go to take part in the dances which are held on such a day.

When a boy runs away from the school and his father wishes to remove him he has to pay the full fees, even if he is not *hitimu*.

Most of the other parts of education the child learns practically from his parents or elders. If it is a girl she learns such domestic work as cooking, plaiting *ukili*, (leaves of date-palm) rearing children, making mats and food covers, etc. The boy learns from his male parents. The fishermen take their sons to sea to teach them how to fish. Such work as blacksmithery, carpentry, hoeing, tending cows and goats are learnt in this same way. But also it depends upon whether the parent wishes his son to follow his calling.

Many village boys nowadays run from their parents' home into the town where they go in search of work to the Indians, who pay them about two to five shillings a month with food and old clothes. Their chief work is to take care of babies by taking them in their carriages in the afternoons, playing with them when their parents are occupied with domestic work, washing clothes and utensils and also fetching water. Others get to the motor stand where they try to earn their living as town boys. They are paid daily about fifty cents.

Girls also attend the Quran schools, but not so many as their brothers. They usually help their teacher's wife in domestic work instead of going to the fields. They are not taught how to write as parents have the impression that if they know how to do so they would write love letters to their lovers. The only other education she gets is a domestic one as described above.

MARRIAGE

When a boy reaches the age of fifteen or over his parents start to look for a suitable wife. Sometimes the young man himself looks for one.

Before the parents of the would-be wife are informed the husband's people go to a medicine-man for divination. It is known as *kupiga ramli* or *kupiga bao* (*ramli*=sand, *bao*=board). He is asked whether the marriage will be a happy and a successful one and especially to divine whether the wife is an ill-omened one or not.

Then if the omens are good the parents of the girl are approached and if their consent is given the dowry is named. It is called *Mahari*. It ranges from about twenty shillings to three hundred shillings. A special day is kept for the marriage ceremony which is a part of Islamic Sheria or Law. Again the diviner is consulted as to the best time for the ceremony to start. They then go to a marriage officer (any learned man is appointed) at the appointed time and day. After the ceremony the people are served with sweetmeats and coffee.

Besides the dowry the husband is expected usually to give the father-in-law some money known as *kilemba* (turban), while the money given to the mother-in-law is known as *mkaja* (which means a cloth or a band of beads worn round the mother's stomach).

Up to this time the husband has not seen his wife. Now comes the ceremony of *Kuingiya nyumbani*, that is the day of the husband entering the wife's house. The diviner is now consulted for the last time and is asked to tell them the best and lucky time the husband to go in. He finds it and tells them. People are invited and delicious foods are prepared. On the appointed day the bridegroom, in his best clothes, then leaves his home accompanied by his people and friends. On reaching the bride's house where there are a lot of dances, they are welcomed to a special room. There they are served with whatever food or light refreshments have been prepared.

At the time which has been divined by the medicine-man previously the bridegroom leaves the people and enters the bride's room. At the door of the room he meets a woman, the *somo*, who asks him to pay some money before he is allowed in. This money is known as *kifungua mlango*, which means a thing which opens the door. Inside the room he sees his wife, fully clothed. The husband is then given new clothes known as *kisutu*. Then his feet are washed, but he has to pay some money known as *kiosha miguu* before he is washed. Then the *somo* leaves them alone, but she stands outside the door waiting for the husband to knock on it and announce that he has finished the intercourse.

The question of virginity of the girl is of great importance. Because if an unmarried girl is not found to be a virgin on the marriage day she brings a lot of shame to her people. Everybody will say that she was not a decent girl. To the bridegroom the greatest importance lies in his ability to commit the intercourse, otherwise there will be no celebrations of any sort. Everybody will be disappointed. Even the bridegroom himself will be disappointed. In fact he will be in shame as we will be afraid of people saying that he is impotent.

After the intercourse the *somo* comes in and when she sees the blood on the bed-sheet she shouts rejoicingly and immediately all the women present join her in singing and rejoicing. The husband is allowed to go to the lavatory and wash himself and the bride is carried on the *somo's* back to the lavatory to be washed too. Outside the dancing goes on the whole night. If the husband is rich he remains in for seven days during which time there is feasting and dancing. Others stay for three days only or less. This period is known as *fungate*.

After this period the husband takes his wife away to his home to lead a happy, or otherwise, life.

DAILY LIFE

The majority of the villagers wake up when the crow of the first cock is heard, that is about half-past four in the morning. The pious hurry to the mosques for prayers and during the harvesting of rice many leave to go to their fields before the birds have awakened. At the same time the milkmen get ready for the work of milking the cows. The wives prepare the breakfast which usually consists of the previous night's remnants of food.

Those who work in the fields, the majority of whom are women, carry their small hoes and baskets and *ukili* (leaves of the date palm). The men carry large hoes and matchets. The women plait the *ukili* on the way to and from the fields and also when they are resting in the fields. In fact some of them have their fields as far away as four miles from their homes.

Those who send their produce to town by bullock carts have to start very early, about three o'clock in the morning.

At noon those who have fields near their homes return, while those who are far away usually come back at about two.

About five in the evening the women go to the village wells to draw water for cooking their night meals. There they spend the greater part of the time conversing and gossiping. There is no communal pail but everyone comes with her own vessel made of the fruit of the baobab or a tin.

The men go to the market, because most markets which are far away from the sea do not get the fish supply until the afternoon and so the customers do not go until that time.

Between two and five the cows and goats are sent back home from the grazing fields. This work is usually done by younger boys who take them to the fields at about six or seven in the morning.

The village people have neither clubs to which they could go during their leisure time nor a recreation park where they could play games like football and cricket. Football has recently been introduced and is very popular among the younger folk, while cricket has never been touched. So they spend their time in the following ways :—

Coffee-shops.—Here many villagers meet for conversation as well as gossiping until sunset when most of them go home for their dinner. Most villagers have their dinner at night between six and eight. Many coffee-shops can be found along the main roads or in villages which are near the main roads. The owners of these shops try to attract as many people as possible so that they may sell their things quickly.

Playing "Bao".—In many villages, in fact in almost all, there are places where people meet to play *bao*, the well-known African game played on a board marked with holes and with seeds. The place is usually under a big shady tree like the mango tree and sometimes in the market too. The players start to arrive from about four and they play till six.

The Market.—Here people meet to buy fish and other necessary articles of food, and also for conversation, as well as for meetings.

Squatting on the main roads.—If there are no coffee-shops near the road, and sometimes even if there are, people go for a walk to the main roads. Often one meets people squatting on the roads conversing and sometimes even if they see a car coming they will not leave until it is very near to them. They leave just in time to allow it to pass then they go back to the same place. At nights, especially on moonlit nights, many people go and sit on the roads.

Attending religious lessons.—Those religious people who wish to improve usually stay at home on their porches revising their books and if there is a learned man they go to him in the afternoon. Usually on Fridays there are no lessons. The fishermen spend their afternoons in preparing and mending their fishing outfit.

At night most people are at home. Others go to visit their neighbours. After dinner they stay for conversation and a few go out. The old tell stories to their grand-children, and on moonlit nights they tell the stories outside in the yard. At about nine or ten o'clock people go to bed and leave the rest of the night for the wizards and witches to rule.

DOMESTIC LIFE

Food and Drink.—The food of the bulk of the villagers is mainly vegetarian but they also eat flesh in the form of fish, fresh or dried or smoked, and dried shark. The fowl is hardly used except on feasts and in the presence of guests. No cows or goats are slaughtered for sale. They may be slaughtered during feasts especially during the month of Rabi-Al-Awwal when the Prophet Mohammad's birthday is celebrated by the recital of Maulidi.

The fact that very little meat is eaten is due to the general poverty in livestock, which are mostly milch-cows; only a few are for sale to the butchers in town.

The villager's chief food is cassava and sweet potatoes which he plants in just enough quantity to support him and his family. He does not worry about tomorrow. He knows that when in need his neighbour is quite willing to help him with a few roots of cassava or some sweet potatoes, which he would boil and eat with a piece of dried shark, if obtainable, and then utter *Alhamdu Lillah* (Praise be to Allah).

Sometimes he scrapes the barks of the cassava roots, cleans them and then dries them in the sun. When perfectly dry he pounds them to powder which he makes into *ugali* which food is highly cherished.

Next to these his other chief food is the *lanana*, which plant is grown behind his hut. He either boils or cooks the fruit with coconut milk. He may also possess a few pigeon peas, plants whose crop is enough to satisfy the family once or twice. The peas are first boiled until soft and the coconut milk is poured on them. He may add a chopped onion. The peas are used instead of curry with rice or as breakfast with gruel.

Rice is usually planted in swampy places by women. But the crop they get does not pay in the least bit. The very great trouble they have taken from sowing to reaping takes about nine months, and the quantity they get may not be enough even to serve them for three months.

A man may also plant a few pumpkins, marrow, sugar-cane, maize and millet (this especially in the extreme north of the Island).

If he lives near a coffee-shop or any other shop he may buy tea and sugar for his breakfast; otherwise it either consists of last night's remnants or cassava

or sweet potatoes or such other food as available. He hardly ever eats an egg for the reason that he can sell it and so buy his food or luxury (which is mainly cigarettes) or any other necessity. He has not yet been taught and therefore does not realize the importance from the health point of view of eating an egg. He is not to blame: he is exceedingly poor. He may live for a whole year without getting a shilling. This too is due to the fact that his agriculture does not pay him. If he lives near the sea he often uses fish with his food. It is his *kitoweo* (relish). He also hardly uses milk for the same reasons as those described above for eggs. When he saw the quick means of transport to town, he thought it better to send the produce to town where he hoped to get a better price. In Makunduchi and Kizimkazi, in the south of the Island, a bottle of milk used to cost only five cents or even less; but when the road was opened and the town was easily accessible the produce was transported in buses to town and the price went a little higher in the villages.

The sexes usually do not eat together. The man has his food on metal or earthenware plates; while the woman has her share in the cooking pots. In the absence of plates rice is served in the *mkungu wa kulia*, a special pot used for putting the grated coconut. Cooking takes place in the yard at the back of the hut or behind the back wall. Sometimes it may take place inside the hut. The utensils consist of a large cooking pot, a medium one and a small one known as *kikaango* for preparing curry, and the stones for keeping the vessels over the fire. The stones are called *mafya*.

The large pot is usually used when there is a big number of people; it is called *ukaango*. In addition to these a man has a *mwiko*, a spoon for stirring food and *upawa*, a ladle used when making curry. He may also possess a metal tea-pot. He makes his tea by boiling water in the pot and then puts in the tea-leaves. The heavy meal is usually served after sunset.

He cannot prepare his budget as he has no fixed income. He buys his domestic necessities daily from either the Arab or Indian shopkeeper. When desperate he searches for two or three coconuts and sends them to the shopkeeper who supplies him with enough rice or any other thing he needs. On the whole he is quite content with what he gets.

He hardly indulges himself in intoxicants. If he does it is with the palm-wine. But nowadays various kinds of intoxicants are manufactured by the mainlanders and the Swahilis who live near the town; in fact there is a great danger as the habit spreads. It will affect his morals very badly ultimately. It is already spreading very quickly in the west of the island. The commonest ones are *tende* (date-wine), *kangara* (millet-wine) and *tembo* (palm-wine).

Cannibalism is absolutely unknown unless it is associated with the wizards and witches of Pemba (see black magic).

Dwellings.—The natives live in rectangular huts and only those very few who can afford it build stone houses. The hut may consist of one room or two, a porch, courtyard at the back containing a kitchen and sometimes a lavatory. It seldom has a window and the rooms are so dark that sometimes a lamp is needed to enable one to see through it in day-time. A man does not have

windows for various reasons, the chief of which are : 1. His hut being low it is easier for a thief to snatch something with the help of a hook from outside. 2. He believes that wizards or devils may enter through them at night. 3. Bad people may throw charms or any evil things through them. 4. They are so low that outsiders may peep through them. 5. To prevent devils hearing children cry at night.

His furniture consists of a wooden bed as high as three feet. On top of it is spread a mat and one or two long pillows. He keeps a spare mat for visitors. He buys a small wooden stool for his wife and if very poor he may not even own a small charcoal iron or wooden box which are commonly possessed. At night he hangs his clothes on a rope tied across the room near the bed. He uses his *shuka* as a blanket. He does not worry himself in the least bit about the mosquitoes. He has not got any idea that they cause malaria. But he has so often been bitten that he has become immune. He never associates the larvae or pupae with the mosquito. But he likes to keep the front of his hut clean by sweeping it, though he may not mind the weeds growing at the sides or behind his hut. In front of his hut he builds a small hut for his poultry ; and in certain villages a heap of stones with just enough room in the middle may serve as a pen.

Livestock.—Owing to the absence of wild animals he does not need to build stockades for his cows or goats or donkeys which are his chief domestic animals. Owing to lack of proper education and training he does not feed his stock properly. He has no pets except probably a cat or he may keep a dog for pig-hunting. He may have pigeons or turtle-doves or birds in cages near his hut.

LIFE IN A DHOW

Many Wahadimu are fine fishermen and sailors and the boys often run away from their homes to work in the dhows, and some of them are taken by their parents for such work when they reach the age of about twelve.

When a boy joins the dhow he is called *uledi* (an Arabic word for boy), and he is given easier and lighter duties to perform. He is supposed to cook. (The owner of the dhow, usually an Indian, supplies him with enough food either in money or kind. Tea or gruel is not usually used in the morning, but rice is the chief food. But during the month of Ramadhan tea and gruel are commonly used). In addition to this he has to loosen or tighten various ropes, for example, *ayari*, *heza*, *amrawi*, and *sabaha*. It is his duty also to hoist and lower the flag, otherwise he may be caned by the officials if he fails to do so. Then he has to split firewood, to paint the dhow when necessary, to assist people in carrying loads and during races to put lard in the lower outer portions of the ship, as it moves much swifter and looks new too. The work of lowering and taking up the canoe is also his. Normally he is paid by trips known as *joshi* which means, for example, a trip from Zanzibar to Pemba and back. The *uledi* gets a shilling and a half. When found satisfactory he is promoted to

Uledi bahari. His duties become more difficult and, moreover, he has to help the *uledi* in carrying bags of rice, etc. He gets three shillings per trip.

From *Uledi bahari* he is promoted to *Baharia*. He does all sorts of difficult work like carrying bags of rice, sugar and others from the shore to the dhow and vice versa. He gets six shillings per trip.

Then he becomes a *Sarahangi*. He is the chief officer. When the captain is away he takes charge of the ship. At night, when it is necessary to sail and the captain sleeps he directs the ship. He is paid nine shillings per trip. Promotion to the post of the chief officer depends upon both the owner and the captain agreeing.

From a *sarahangi*, he can become a captain who is entirely responsible of the whole ship and the goods in it. His duties are to direct the ship, to go to the offices to prepare everything necessary for the trip, goods, passengers, etc. Every trip he gets twelve shillings. Sometimes he bargains with the owner to share the money obtained, in half. If he gets a hundred shillings, the owner is to get fifty and he fifty too.

Sometimes the sailors sleep in hammocks made of gunny bags hung under the roof, otherwise they sleep on the goods. The captain himself sleeps in a wooden bed (charpoy). He is not supposed to take his wife. The passengers spread their bedding on the goods when they want to go to sleep.

The lavatory is an empty box hung at the side of the dhow. In its middle there is a hole large enough to allow the deposits to pass freely. Beside the box there is a pail made from a baobab fruit which is used for taking water from the sea for the purpose of cleaning oneself.

ARTS AND CRAFTS

The native arts and crafts are limited in comparison with those of the mainland, and in remote places they are made in primitive ways. Unfortunately, they are fast disappearing since the young men no longer take an active interest in them.

Poker work.—The finest form of art is that to be found in the poker work in the wooden spoons (*miiko*) and *mbûzi* (an article for shredding coconuts). The art has various patterns.

Fine decorations are also made on ladles. They are made by turning round a sharp two-pointed piece of metal. Then lime is rubbed on the fine grooves.

Traps.—There are no fierce wild animals beside the leopard, and one can see traps set in the villages where they abound. Pigs are usually not trapped but hunted. The hunters accompanied by their dogs attack a pig with their spears, the pig having been brought to bay by the dogs only. Occasionally pig-hunting takes place on moonlit nights but is commonly held during the day. Mr Ingrams ("Zanzibar," page 298) has been misinformed on this point. Monkeys, who are destructive to the economic crops, are caught in specially made traps. The gazelle is trapped with nets and its meat, being edible, is sold. Children usually make traps for birds. They are either caught with a trap set in a bird cage or with resin called *urimbo*. Rats are caught in baobab traps

which have a small hole to serve as an entrance and a noose inside to secure the head. Various kinds of fish-traps are made. The ancient one is that known as *dema* (wicker basket) and described in the "Periplus." (a seaman's guide of the first century A.D.).

Measures—consist of *subiri* (palm of hand stretched) about nine inches. *mkono* (the hand, from the elbow to the tips of fingers) and the *pima* (from the hand, from the tip of the fingers of one arm to the other, right across the chest). Weights are measured with a *pishi*, *kibaba*, half *kibaba* and quarter *kibaba*. The old *pishi*, now obsolete, was a wooden one and was used for measuring cloves.

Iron work.—There are few natives who engage themselves in iron work, and only a few articles, such as small knives, door-fasteners and small hoes, are made. The smith's tools are few; an anvil, a hammer, pincers and bellows which are made by himself out of a skin.

There are also a few skilled gold- and silver-smiths. These usually work with the Indian smiths in the towns.

Pottery.—Women particularly engage themselves in this industry. No wheel is used, but the potter has to use a board and her fingers. After an article has been moulded it is dried in the sun and later baked in the fire in the ground. The commonest articles are cooking pots and their covers of various shapes and sizes. The old earth lamp has disappeared and has been replaced by tin ones made locally by the Indians. The cheaper Indian-made drinking water-pots are also replacing those made by the natives.

Matting work.—This is entirely made by the women. The material used is strips of *ukili* plaited together to a considerable length. If required to make a mat they are dyed in various colours. Then the broad strips are sewn together to make a mat or a cover (*kawa*) or a praying-mat (*msala*).

Space does not allow me to describe other industries but it is worthwhile enumerating them: Carpentry, carving, canoe-making, charcoal and lime burning, embroidery work in caps, sandal making.

ETIQUETTE

Salutations.—The old villagers very much appreciate *shikamoo*. An old woman considers it more polite to be greeted with *shikamoo* than with *subalkheri* or *msalkheri*. If she is greeted in this latter form, which is of Arabic origin, she usually says: "Hallo, why do you wish to make me older?" They will not agree unless greeted with *shikamoo* which actually means "I clasp your legs," that is, I am humble to you. "Shika" means to hold or to clasp; and "moo" is a form of "mguu" which means a leg. In reply, a man says *Marahaba* which is an Arabic word meaning "well." Normally children and young men greet their elders. Sometimes when a boy greets his elder he clasps the elder's hand and kisses it, but this is an Arab custom.

If a man passes in front of a group of men he must say, *Salaam Aleikum*, meaning "Peace be upon you," and the people reply, *Aleikum salaam*,

meaning "Peace unto you too." If he stops or stays for some time he then greets his elders and he is greeted in return by his juniors. After greetings he is usually asked : *Jee habari za kutwa?* (What is the news of the day?) and he answers *Nzuri* (good). He may be asked *U hali gani?* (How do you do?) and he answers *Sijambo* (Quite well). The word "*sijambo*" is an abbreviation of "*sina jambo*" (I have no affair). If he is not well or not in a happy mood he answers "Good, but it is just the same."

Educated natives use the Arabic salutations, *Keyfhalak* (How do you do?) and the answer is *Tayyib* (Well). But this is only common among people of the same age.

Greeting a stranger depends upon his race. If he is an Arab the Arabic form is used. After greeting the host says, *Karibu* (Welcome) and the stranger says *Starehe* (Be seated) as when saying *Karibu* the host must be standing. Both these words are Arabic. If the stranger is an Indian like a Hindu he is greeted thus : *Jambo*, *Seti* ("Seti" is an Indian word) and he replies *Jambo*, *bana* ("bwana") or only *Jambo*.

But it is quite different with a European. The arrival of a European in a village makes all the people alert, because it is known that a European does not go into a village except for government or investigating reasons. All the people look at him while the women and children run away. Only the Sheha or his assistant or a leading man goes to meet him.

Many Europeans when greeting use *Jambo*. But this is wrong ; because the meaning of the word *Hujambo* is *Hunajambo* ("You have no affair" or "You have nothing"), but saying *Jambo* only does not mean anything in greeting. When replying it is better to use *Sijambo* meaning "I have no affair" or "I have nothing."

It is absolutely bad manners to enter any one's house or hut without asking permission by saying *Hodi*, and one should not get near or in unless told, *Karibu*. This is enjoined in the Holy Quran that no man should enter someone's house unless permitted.

BLACK MAGIC IN THE ZANZIBAR PROTECTORATE

Every native has a deep belief in black magic whose sole aim is to do evil to people. It falls within the power of the *mchawi* or wizard, if male, and witch, if female, to do all sorts of evil.

The worst type of wizards or witches are those known by the name of *Wanga*. Pemba is notorious for these *wanga*. They are believed to be a number of people who have formed a secret society whose meetings are held at night. They are supposed to have the powers of passing through a wall by striking it with a magic wand, of turning into cats or dogs or even laskets (*mapakacha*). They are also supposed to practice cannibalism, and eat the dead bodies of their victims. The initiate to the society is asked to provide a man, known as *kutupa mtu*, who must be either his father or mother or son or any other of his nearest relatives. If he cannot do so he cannot join it.

The belief is so deep-rooted among the villagers that it is next to impossible to shatter it. Even the late Bishop Frank Weston seems to have believed in the existence of this nefarious society, so much so that he condemned two or three people to the then British Resident of Zanzibar (Mr J. Sinclair) of being *wanga*.

The notorious witch of Pemba, now dead, was well known by the name of Bikirembwe; she was supposed to be able to fly from Pemba to Zanzibar and back the same night. She was either the leader or one of the leaders in their station at Pemba known as "Giningi."

In Zanzibar the Mangapwani area is notorious for *wanga*. Bumbwini, a village in the same area, is supposed to be their meeting place. I cannot bring this question of *wanga* to an end without narrating the following story told to me by one of my nearest relatives.

She went to pay a visit to the family shamba at Mangapwani and decided to spend a night there. At about two o'clock in the morning she began to feel her hair standing at an end and a feeling of fear slowly creeping over her. She opened her eyes and just in front of her stood an old lady quite naked but for a piece of cloth round her waist, dancing. When she asked her what she was doing she pretended that she was looking for bugs. Of course, the great fear made her run a high temperature and nothing would induce her to spend another night at Mangapwani.

In this same village the dogs are called *madalali* (auctioneers). When a dog barks and then wails it is believed that it is announcing the death of someone.

Tego.—(Derived from *kutega* to entrap). So *tego* is a snare left to entrap the would-be adulterer in the absence of the husband. There are various kinds of "tego" such as *Tego ya Mbwa*, *Tego ya Kisu*, *Tego ya Mkeka*.

If one wishes to know whether a woman has "tego" one should take betel nut leaf and keep it under the bed-sheet, but care should be taken that the woman should not see it. Then one should try to send her out of the room, after having sat on it, under any excuse. If one finds the leaf dry then one will know that she is entrapped.

Sihir (An Arabic word meaning "Witchcraft").—*Sihir* is used when one wishes to kill or harm or inflict great bodily pain or any great misery on someone. It may be a black hen, hairs from a black cock, or roots of various magic plants wrapped in a piece of black cloth and thrown at crossroads or into the sea. A name of a person, his nails or clothes may be enough to use for killing or harming him with a *sihir*. If a man is known to have been given a *sihir*, a special man is summoned to extract it (*kuchomoa*). He comes along with a small sharp knife or razor, certain roots or medicines and a horn. Then he searches for a suitable place on the man's body from which he can extract the *sihir*. He makes a few incisions on the particular place and then mutters something and at the same time squeezes the place from which the *sihir* comes out.

I was once present at such a ceremony and could not see how the trick (that is what the present educated young man believes) was done. What I saw was

the medicine man bending a little over the invalid and in a second he produced a large paper on which was written some writings and several roots and other medicines tied together and wrapped in the paper. Of course no one but the *mganga* could understand what was written in it as the writing was very illegible. Moreover, the patient's people refused to touch it and even to have it read to them. Of course the medicine man had already terrified them. He rubbed the medicines he brought on the supposed place where the *sihir* came out and then, having pocketed his fee, he took the *sihir* and bade farewell to the people.

Taming of Leopards.—It is believed that in certain parts of the southern districts there are people who tame leopards who are later used for killing or harming people.

Mizimu.—Every village has an *mzimu* which may be anything from a cave to a tree. Villagers have very firm beliefs in these *mizimu*. In fact it is a place of worship as they go to an *mzimu* to make a vow for a child, good health, successful marriage, etc. The care of the *mizimu* is hereditary, and the owners are known as *wana-vyale*. In fact, in certain caves one is never allowed to go in unless one is accompanied by a *Mwana-Vyale* who has to ask permission for entering: "*Hodi, watu wakubwa, wageni wanakuja.*" (May we come in, great people, the visitors are coming.) The "big people" are the devils and jinnis. In one cave in the southern district at a place called Kizimkazi Dimbani, there is a cave which the people say that if people call each others' names they will turn into stones. In the same cave there is a stone about three feet high which people believe to be a woman turned into a stone. The cause of it is narrated as follows.

A certain man had two wives who were very jealous of each other. One day one of them thought of a plan of getting rid of her fellow-wife. So one morning they went together to the cave to draw water. The plotter lagged behind a little in order to give the other one time to get down to the water. When she saw her stooping to draw the water she called her by her name and she remained quite still unable to move or speak. Then the plotter went home and when the husband saw her alone he asked her of her fellow-wife. She told him that she knew nothing about her. But the husband suspected something evil as he was aware of her great jealousy. After much force she told him that she had turned into a stone in the cave. The husband accompanied her to the cave and when he saw that his wife there inside had turned into stone he became so excited that he caught hold of an axe and killed the other wife who was later buried near the cave.

Now every year there is a custom of making a feast near the cave in memory of the woman who turned into stone. After the feast the remnants of grated coconut and other things are taken and thrown on the grave of the so-called murderess.

At the entrance to a cave or if a tree, below it, one can see new cooking pots, censers, rags and even coins.

MISCELLANEOUS

Dress.—The native man wears a *kanzu* (a long white garment) and a white cap and a *shuka* round his waist. He wears neither sandals nor shoes, but in rocky areas he makes sandals out of the thick outer skins of the banana plant, coconut bark and also out of old motor-car tyres.

He either puts his money in a girdle (known as *mkwija*), worn round the waist on the *shuka* or he simply puts it under the folding of his *shuka* (called *bindo*.)

The woman wears a *Kanga*. One worn round the body from the chest downwards and the other is used as a shawl to cover the head. It is called *ushungi*. When going on a long safari to town she usually wears a *buibui* to cover her body, though the face is usually left open. She has a necklace of beads and glass bangles. In the holes of her ears she wears beautiful round papers.

The shaving of the head is widely practiced and the so-called English hair-cutting is often considered to be irreligious. It is performed with a razor or even an ordinary sharp knife. The hair is, of course, first damped with a little water and is scraped by a friend. No fee is charged except when on a visit to a barber, whose absence is conspicuous in almost every village.

The woman plaits her hair and sometimes to make it look nice and glossy she applies a sticky substance known as *behedani* which consists of soot, water and certain black seeds.

The old folk like to keep a beard and moustache and occasionally one may be lucky enough to see an old woman with a few hairs on her chin.

Weapons and Warfare.—The native, being a peace-loving citizen living in a peaceful country, does not possess any weapons for warfare. His only weapons are probably a big knife, a stick or a club and, if a pig-hunter, a spear.

Riddles.—At night when in complete leisure people like (especially old men and women) to propound a number of riddles to their children. The game is started as follows :—

The questioner says : *Kitandawili* (a riddle), and the listener replies : *Tega*.

The following are a few riddles common among the Wahadimu of the southern district.

1. *Hicho hicho hukioni* *Kisogo*.
(It is there you don't see it) (Nape.)
2. *Arrr mpaka Maka* *Utelezi*.
(Arrr to Mecca) (Slippery.)
3. *Uzi wa babu mafundo* *Ukoka*.
(The grandfather's thread is knotty) (*Panicum trichocodium*.)
4. *Bwana mkubwa kagu na makoba koba*
yake *Mgomba*.
(An old man has fallen with his bags) (A banana tree.)
5. *Kun kun kubata* *Kiguu cha paa*.
(The sound of a gazelle's legs) (A gazelle's legs.)

6. *Ukiona njigi hugeuza njege na ukiona
njege hugeuza njigi Tui na maziwa.*
(If you see *njigi* you think it is *njege* and
if you see *njege* you think it is *njigi*) ... (Coconut-milk and milk).

These two are typical Pemba ones.

1. *Nende huko nikirudi nimshike ngombe
wa mama mkia-kata.*
(Let me go there and when I return let
me hold the tail of the mother's cow) ... (Ladle for drinking water).
2. *Mwarabu mweupe hupi mkono Moto.*
(You don't shake hands with a white
Arab) (Fire.)

Stories.—The native is exceedingly fond of telling stories, some of which are long and some short. The stories of *Atunuwas* are fairly popular. In children's stories the rabbit is the common and popular hero. But the long stories are usually about the ghouls and eastern kings, something like those of the Arabian nights.

The tale is usually started as follows :—

"Paukwa" says the narrator.

"Pakawa" says the listener.

"Paliondokea chenja gaa.

Akajenga nyumba akakaa" says the narrator.

He starts then by saying "Hapo kale paliondokea."

Corresponding to "Once upon a time."

Turkish Bath.—This is supposed to be a cure for fevers. A big pot in which stones or leaves have been boiled to an exceedingly high temperature is brought near the invalid who is wrapped in heavy clothes. The pot is put under his clothes and the cover is opened to allow the steam to get all over the body; the patient perspires very much. When the steam is finished he is sent to bed and covered.

Cock-Fighting.—This is a gambling game. It is conducted by bands of people who work very secretly. It is usually played in the bushes. It is held in great secret because the Government prohibits it as gambling as well as cruelty to animals. A good fighting cock may be worth thirty or so shillings.

Shehasor Village Headmen.—The Protectorate is divided into areas called *Mudirias* under an Arab *Mudir*; and each *Mudiria* has several *Shehias* or villages under *Shehas*, the village headmen who are government employees. This title of *Sheha* is quite an ancient one; as it is believed that the word *Sheha* comes from a Persian word *Shah* meaning a prince (perhaps showing Persian cultural influence). In front of the *Sheha's* house a red flag is hoisted daily from daybreak to sunset. He has a brass badge of office; a black waistcoat or long coat and a whistle. He sits and helps the *Mudir* in the district court.

Card-Playing.—In addition to *bao* people also like to play cards. The common games are *Wahid-u-sitin* (sixty-one) or *Chanis*. Besides these two they gamble by means of these cards.

Superstitions.—The average native has a deep belief in various superstitions; and in fact there are so many of them that it is impossible to enumerate them in detail in this small work. But I have attempted to put down the common and simple ones.

It is believed that ill-luck will befall one who sells salt or needles at night. It is curious to note that even the Indian shopkeepers share this belief. But in case one urgently needs either of these at night a kind shop-keeper may do so, but immediately after he must throw some salt on the roof or in the fire. Or sometimes when one wishes to buy salt he says: "I want the medicine."

A one-eyed person is always supposed to bring ill-luck when met the first thing in the morning.

To sit on a wooden mortar is conducive to boils and lumbago.

The hooting of an owl is a sign of the presence of wizards.

If a donkey refuses to go ahead even if it is beaten it is a sure sign that there are wizards or devils in front. The black round spot on the donkey's foot is supposed to be the eye by which it sees the devils and wizards.

Sitting on the threshold causes laziness or brings ill-luck.

Eating while walking might cause the eater to be attacked by a devil.

If one gets a sty on one's eye it is a sign that one has laughed at one's father-in-law. To be relieved of it one should go and laugh in a wooden mortar.

To tread on food causes elephantiasis.

If a bachelor eats his food from cooking-pots heavy rain will fall on his marriage day.

If one hits the floor with a wooden pestle an old woman will come out of it and jump on one's back. To remove her one has to get the skin of a fly.

If a house is cleaned before three days after the owner has left on journeys he will never come back, or he will be late in returning.

If one is touched with a *mwiko* (a wooden spoon for preparing rice) one should lye it or otherwise one will turn into a thief.

If a hen stands on one leg it is a sign that some one will die.

When pigeons leave a house it is a sign that some one in the house will die.

If one goes bareheaded on a moonlit night one becomes mad.

When a cat cleans its face while facing north a visitor will come.

When one bites one's tongue accidentally it is a sign that people are talking about one.

When a man leaves his house and forgets his cap his wife will bear a male child.

Albinism.—Albinos are found in villages, but they are in a minority. Albinism is not a bar to marriage or reason for dissolving it. It is believed that the Albinos are devils' children. The devils found them ugly and exchanged them with human ones.

DEATH

Immediately someone dies the inmates of the house before sending out the news to relatives and neighbours first keep everything in order in the house that it may be a fit place for mourners to sit. Then they start wailing, and some people are sent out to inform the villagers and relatives. It is surprising how quickly news of death spreads in the rural areas, especially when the deceased is a person of some importance.

At the same time other people, usually the relatives, go to buy the shroud (*sanda*), a board and other necessary ingredients such as camphor and cotton-wool for embalming the dead body. A few people, especially the learned ones, sit round the dead body and read some chapters from the Holy Quran. At the cemetery there are people digging the grave which is about four to five feet deep and five to six feet long. On the north side of the grave a cavity known as *micana wa ndani* is made. It is in this cavity that the dead body is placed and the board covered on it.

At home the dead body is laid on bare cords of a bedstead kept at a corner of a room. Under the bed a hole is dug so that the water that is used in washing the body runs down it. This place is known as *ufuo*. A washer is summoned and does his work as ordered by the Islamic law. If there is a mosque adjacent to the house the shroud is sent there to be cut to the size of the body. When the dead body has been washed and dried up and all holes filled with cotton-wool mixed with the embalming ingredients the shroud is wrapped round the body. It is then wrapped in a new mat and placed in a bier which is covered with clothes like *kanga* or shawls. If the deceased is a woman a *kanga* or piece of calico is tied round the middle of the bier. Then the bier is taken by the mourners to the nearest mosque where the funeral prayers are said. It is later taken to the graveyard. The wailing increases very much when the bier leaves the house. It is the women who wail usually.

At the graveyard about four to five people descend to the grave and a long cloth or cloths are spread over them and the grave so that other people around should not see what is taking place inside. The dead body is then pushed slowly through one end of the bier into the hands of the receivers who lay the body in the cavity with face to the "Qiblah" (north). Then the cavity is covered with a long board and soon after the grave is filled to the top.

Usually with some people while the body is being interred the mourners are provided with copies of the Holy Quran from which they read some chapters until the grave has been filled.

For three days after the interment people, men and women, sleep at the deceased's house in order to console the bereaved family. This period is known as *matanga*.

At night, after the night prayers, the men meet together in a mosque or near the house and read Quran, then they are given coffee or "ginger-coffee" (the dried ginger is pounded and the flour is mixed with hot water and sugar).

This continues for three nights and is known as *hitima* or *tatu* (that is three days).

A special day is kept when most of the mourners leave for their respective homes. This day is known as *kuondosha matanga* or *kukunja matanga*, meaning remove the period of mourning. The house is usually cleaned on such a day.

On the fortieth day a big feast known as *arubaini* is held. After this day the last of the mourners leave.

The wife remains in mourning for a number of months (four months and ten days for a free person as enjoined by the Islamic law) and the period is known as *Eda* during which time she wears black clothes and never goes out. When she converses she does so in a very low voice ; and when she goes to the lavatory she carries her husband's stick or burns some frankincense.

The Watumbatu of Zanzibar

By Ian H. O. Rolleston

[*Foreword.*—Ian H. O. Rolleston died of injuries, received while on duty, in a regrettable affray which occurred at Zanzibar on the seventh of February 1936. In anticipation of an appointment under the Colonial Office, he had studied anthropology at Cambridge, and his interest in the subject was finding increasing scope at the time of his death. Shortly before he returned to Zanzibar after his last leave he left some manuscripts in my care and the subject matter seems to be of sufficient interest to warrant publication. The script did not form a coherent whole and I have accordingly selected what, in my opinion, is of most importance and have given it as much coherence as possible, while keeping strictly to the letter of the manuscripts. Rolleston was well aware that his material was incomplete and it had been his intention to supplement it on his return to Zanzibar. His own note on the subject makes this clear:

“No one is better aware of the gaps in this narrative than I. I have merely written it down in order to be able to properly observe their extent, and to be able to return to Zanzibar with a clear idea of what I should enquire into. Among the more important items is the organization of dance clubs, ghosts, etc., omens, the origin of certain designs. I have omitted any of the history of the Watumbatu which is not legendary because this may be found in the books published on Zanzibar.”—J. H. DRIBERG.]

I.—THE COUNTRY OF THE TRIBE

IT IS difficult to set any limits to the country the Watumbatu live in and it is growing daily to be a more useless effort. Owing to the excellence of the roads there is a frequent service of motor-buses to and from town, with the result that both emigration and immigration occur to a considerable extent. As Ingram* says, the only place which is certainly inhabited exclusively by Watumbatu is Tumbatu Island. Foreigners are pressing almost daily further and further into the country which was once inhabited by the tribe to the exclusion of others. The district of Mangapwani, for instance, is now completely cosmopolitan and there is a colony of Wanyamwezi at Banda la Maji, many of whom have not embraced Christianity or Islam. All African foreigners and Arabs are strongly discouraged on Tumbatu Island.

The Watumbatu are a shy tribe and have retired before the advance of the Arabs to the less accessible parts of the district. They are found mostly along the coast and inland north of the Mkokotoni-Kinyasini road. They are in strong numbers as far south as Donge. East of Kinyasini there are only a few of them and the local natives are Wahadimu. Northwards they extend as far as Nungwi.

**Zanzibar, Its History and Peoples* (1931), p. 31. This paper supplements the various references made there by Ingram to the Tumbatu. Tumbatu Island lies off the north-west coast of the island of Zanzibar.

II.—THE ISLAND OF TUMBATU

It will not come amiss to mention separately the island of Tumbatu, for there the most primitive of the tribe live and their customs have been less subject to outside influences. There are two settlements there; Kichangani-Gomani and Chongowe.* In the following section Gomani will be noticed separately as the probable original settlement after the fall of the now ruined city of Makutani, which is the modern name for the Tumbat of ancient Geographers.

The geological formation of the island is coralline limestone and in many parts small underhung cliffs guard the island. The soil is shallow and everywhere rock emerges. This does not prevent the growing of quite good maize and millet crops, but little else can be grown except the inevitable coconut tree.

A visit to Kichangani-Gomani—the two are now indistinguishable—was always an exciting business. For one thing this was the fountain head of tribal tradition and the place was alive with invisible people. My guide would go before, and looking down the lane between the houses, make a slight gesture and frown. Then would come the sound of hurrying bare feet and possibly I would catch a glimpse of a petticoat and a black leg. Again when passing the backyard of a house, over whose palisade I could easily see, I would become aware that I was observed. On glancing round, four or five pretty girls could be seen, smiling and delighted at their wickedness. Of all this business my conductors, who were often in numbers, took not the slightest notice, nor did I.

The two villages are quite different in character, though their inhabitants are certainly of the same stock. Kichangani-Gomani was invariably filthy, and planned apparently with the object of keeping out light and air to the greatest possible extent. During the rains there were great pools of water at every turn, and not infrequently a detour had to be made to avoid a wetting. The streets are about two yards wide and the eaves of the houses hang over so that care must be taken not to get jabbed with a piece of the roof when turning a corner. Though I must have visited the place something like twenty times, I should be diffident of finding my way without a guide.

Chongowe, the other settlement, is at the other (the south) end of the island, and is remarkable for always looking clean and as if it had just been swept. The origin of its name was told to me by the very old headman or *sheha*: "Years ago there lived here a man called Chongo, and Yussuf† wished to kill him, and a friend of Chongo's came to warn him of it. But he could not find him. So he went about shouting '*Chongo wee, Chongo wee*,' until he found him. So ever afterwards they called this place Chongowe." It may be mentioned that Chongowe is the Hadimu name for a whale and a place name in the district. This old *sheha*, who was alive in 1931, is a link with the past,

* Kichan and Jongoe on the map in Ingram's book.

† See section III for further details concerning Yussuf.

for he was of an age to remember Seyyid Sa'id bin Sultan (ob. 1856) and succeeded his father as *sheha* shortly after. There is an old mosque at Chongowe, very strongly built and with far thicker walls than is now the rule. It was said to have been built (perhaps) by one Muhammad bin Abdulla Albushir.

Nothing has been said of the ruins of Makutani. The reason is that nothing short of excavation could yield more than has already been found by Major Pearce and recorded in his description of the ruins of Zanzibar and Pemba.*

III.—THE ORIGINS OF THE TRIBE

In company with all other coastal tribes in Africa, the Watumbatu claim to have come from the Persian Gulf, and to have settled in Tumbatu. Their chief was one Yussuf, who, according to tradition, ruled at the now ruined town of Makutani (Walls) until a raid by Arabs destroyed it, and the inhabitants, with a few exceptions, were put to the sword or enslaved. The position of Makutani seems to bear out this theory. It is possible to take a boat right up to the shore, opposite the mosque which is still visible from Mkokotonit at two or three miles distance. The foundation of a town there was in fact almost an invitation to destruction. When the remnants of the tribe came back and found their town destroyed and deserted, they founded a new village at Gomani, which is an extremely well-defended place. The approach to it is very difficult through most intricate channels, and any hostile party would easily be spotted from Popo Island to the north, or from the limestone cliffs which run parallel with the channel. One very old inhabitant gave me the origin of the name Gomani, saying that there was a fort there. The word used by him was *boma* (fort) and I said that I supposed they preferred saying Gomani to saying *boma*. The ancient agreed. Another and still more venerable inhabitant said the name was due to the *goma* or overhanging limestone cliff there. Of these two the first is the more likely in spite of the idiotic explanation. The word *ngome* in Swahili (like *boma*) means a fort. As for the other explanation which should not at once be dismissed as improbable, it should be borne in mind that such names are usually in the plural; and this form would be particularly appropriate in this case as there is about a mile of *magoma*.

In the previous section the legendary figure of Chongo was mentioned. He is said to have been a native of the mainland of Africa and, after so nearly quarrelling with Yussuf, to have joined forces with his party. The progeny of the two parties were the original Watumbatu. As will be seen in the next section there is considerable evidence for believing that the tribe is the result of intermarriage between Asiatic and African stock.

* *Zanzibar, The Island Metropolis of Eastern Africa* (1920).

† On the island of Zanzibar, south-east of Tumbatu Island.

The Portuguese visited Tumbatu and inscribed a baobab tree in the district as follows :—



The letters are about ten feet off the ground and about a foot high. The result is that the Portuguese are giants in legend. There are said to have been fortifications at Mkokotoni, but of these very little remains except a few stones. Much is laid at the door of the Portuguese and amongst other things the introduction of the African bush pig.

IV.—PERSONAL CHARACTERISTICS AND CONDITIONS OF LIFE

There is no type of Mtumbatu just as there is no type of Arab. Some of them might be taken for half-caste Arabs, others for negroes from the mainland of Africa. It is probable that they are a negroid race, but they bear signs of different ancestry from that of other negroes. They have aquiline features and are often not prognathous; the forehead is usually bowed out. It is not easy to tell the difference between a Mtumbatu and another native of the island from appearance, but they are markedly different from the natives of the mainland of Africa.

They are probably a mixed race as they do not exhibit so much as the Wahadimu (the other tribe in Zanzibar) the characteristics of the true Bantu; they are gloomy, reticent and proud: they have not the same ceremonious address as other Africans; their features are not those of the ordinary Bantu but are more finely-shaped resembling what is called the "base Arab" type.

Their principal occupation is fishing and the coastal dhow trade between Zanzibar and Pemba. Many have emigrated inland to the island of Zanzibar where they have taken readily to agriculture. The island of Tumbatu is fairly fertile though the soil is not so good as that of Zanzibar. No cloves are grown on the island, but there are considerable plantations of coconut trees round Kichangani-Gomani. African millet (*mtama*) and cassava are grown in considerable quantities close to the settled areas. Most of the agricultural work is done by the women, as the men are busy in the dhow trade or in fishing. Most of the island is covered with dense bush. There is no water on the island and the inhabitants get it from Shangani in Zanzibar, travelling across in large canoes, often at dead of night. Very few wild animals, but many birds, live on the island: the guinea-fowl is found in large numbers but it is difficult to come up with owing to its shyness and the density of the bush. A kind of heron with black plumage greying towards the belly and yellow feet, locally known as *kisiwani* ("of the island"), lives there and I have seen no specimen in Zanzibar. No *paa* (small antelope) exist there, in fact

the only wild animal known there is a kind of rabbit locally known as *pelele* whose flesh is unpleasantly highly flavoured.

The first impression of the Watumbatu is not a favourable one. The visitor, even though he is accompanied by someone who is well known in the island, is greeted with black looks. Women and children flee before him as though he were plague-stricken, but remain to peep round corners and disappear as soon as looked at. No child will look him in the face and no information is vouchsafed by the grown men unless demanded. On his second visit, however, and if he shows some interest in their affairs, the grown men will lose their shyness and talk freely with him. Above all if he can make some allusive remark about Tumbatu they will thaw for ever.

In almost every book on Zanzibar that I have read the dislike of the Watumbatu for strangers is dwelt on at some length; they are also accused of churlishness and ill-manners. The first allegation is to a certain extent probably due to information received from Arabs, whom they do undoubtedly dislike heartily. But it is a mistake to lay stress on it. They do not distrust Europeans or Indians to any extent, but they have a good reason for distrusting Arabs. A man of forty told me that his grandfather was carried away into slavery. Slavery is thus an ever constant danger to them. Since they never acquiesced in slavery as, to a certain extent, the Wahadimu did, it is a particularly unpleasant nightmare for them. I was told that the only reason for there being no Indians on the island was that they would find no business to do. In common with other Zanzibaris they despise all Africans who do not speak their own brand of Swahili, nor do they trust them. One said to me that even if such an one were to settle among them, and bring up a family, and his children should speak Swahili as the Watumbatu speak it, yet their nature would be bad. Chinese traders in search of *bêche-de-mer* have been perfectly comfortable on Popo Island without any fuss being made.

It is difficult to understand the attitude of an Englishman (of all people) who, because he does not get a rousing welcome from villagers, says they are a churlish and unfriendly crowd. The reason for this shyness may be expressed in two words: "Slave Trade." Up to two generations ago Arab slavers were liable to sail in at any moment and carry off slaves. The very name of the Muscat Arab is still hated, though a distinction is drawn in favour of those Arabs who have settled some time in the island.

It will be of interest to digress for a moment to see those parts of the island of Zanzibar in which Arabs have not yet settled. They are very few and far between, roughly perhaps Tumbatu and Ras Nungwi in the north and a strip of barren country on the west coast in the south between Chwaka and Makunduchi. In the settled areas the natives have lost their horror of the Arabs on finding him a good master and neighbour, and it has been realized that the Arab slave merchant and the Arab settler are two very different persons. It is a common sight to see many Swahilis gathered round the house of an Arab, working for him for their food only, on familiar

terms (to a European shockingly so) with the whole family. The dislike of Arabs varies inversely with the amount of settlement in the district. Thus in Tumbatu and at Ras Nungwi nothing too bad can be imputed to Muscat Arabs.

In the days of the slave trade Tumbatu lay between two fires—a Shehr Arab slave station at Kidote and a Muscat Arab station at Mangapwani. It is possible from the positions of the various villages and the ruins to form some idea of the terror which pervaded the life of these unfortunate people. To the north of the island there is no village at all, only a few fisher folk living near the new lighthouse at Mwana wa Mwana. In the south is Chongowe, which was probably a look-out station to guard against invasion from the south. It is thoroughly protected by shallow water on both sides (east and west) extending some distance from the shore. Directly opposite the government office of the northern district is Makutani, the ruins of Tumbatu. This settlement is not protected at all and is now deserted. The ruins are of considerable extent and the principal building is an arcade of Moorish arches with a beautiful *qibla* or shrine on the north wall on the western side of, and immediately adjacent to, the arcade itself. It is very difficult to decide who built this because the Watumbatu themselves are enthusiastic builders. Given the materials they build an admirable stone mosque, cistern or the surround of a well. Were it not for this fact one could suppose all manner of easy hypotheses about Arab slaving stations and omit entirely the question as to whether the Watumbatu are partly of Persian stock. It will be enough to say that Arab buildings of the twelfth century A.D. exist in the island and the Watumbatu were probably early converts to Islam as a consequence of the Ibadi incursions. They probably learnt the art of building from these invaders.

Though they are reserved, the Watumbatu are as capable of as deep emotion as other people. I was told of one lad, who had lost his mother and had therefore not been to work, that he had cried like a child. But when I asked him about it and commiserated with him, it was all I could do to stop myself from saying: "But I thought you cared for her," such was his apparent indifference. Although they are highly emotional, yet in their quality of pious Mohammedans they must never forget that all good and evil comes from God. It may be due to this fatalism that they seem sometimes quite indifferent to danger, and will face a storm at sea which would prevent any fisherman of ordinary prudence from going out at all. The only time I had experience of fear being shown was due to the old enemy, the Arab. A dhow bound for Muscat had put in at Nungwi and this action produced a terrified telephone call. The pretext for landing had been that there were sick men on board and the visit of a Goanese dispenser quickly drove them away. On the whole the Watumbatu are an irascible rather than a timid people and do not fear to hit back physically or metaphorically.

If one were to believe most accounts of the health of the Watumbatu one might imagine a tribe suffering from all the ills of in-breeding, with feeble bodies, feeble minds, criminal tendencies and exaggeration of defects. Actually

the Watumbatu show none of these; they are as good workers as any, once they have made up their minds to the unpleasant necessity.* They are unusually shrewd; crime is not a danger and consists in the main of only petty offences; monsters and lunatics are, as far as I know, rare. The stock, moreover, gets a certain amount of renewal, as the Watumbatu marry women from the Wahadimu, who are by no means in-bred, and probably from the Wapemba as well. During a visit to Pauza I found a colony of Watumbatu who told me that the Watumbatu from Zanzibar Island married their women and *vice versa*. Isolated as they are from other Watumbatu, the people of Pauza have inter-married with the Wapemba, Shirazi and perhaps the people who live at Chokocho.

With regard to disease, the most frequent complaint is known as "fever" and may be anything from constipation to malaria. Ulcers are very common; framboesia is common in the more congested areas. It is always said that venereal disease is almost universal, but personally I have seen few signs definitely to bear out such an assertion. A test carried out on school children showed that everyone was afflicted with ankylostomiasis. How much Africans are affected by either ankylostomiasis or venereal diseases is difficult to say with any certainty. But I have been told by one who investigated the subject thoroughly that the reduction in vitality, caused by the former disease, is slight and not to be compared with the effect on Europeans.

The Watumbatu are a long-lived race in spite of conditions which we should consider almost worse than death. Child mortality is high and varies according to the local conditions. Thus in Kichangani-Gomani it is high, in Nungwi it is somewhat lower. Conditions in the former village have been described already; those prevailing in Nungwi are very much better and there is no overcrowding.

It cannot be said that any method is employed in planning villages, but the method of their creation may be described. Some of these villages are crowded and some extend for a not inconsiderable distance. The reason for these differences is probably that there is not, in the case of the crowded villages, enough room to expand owing to the inhospitable nature of the soil. Naturally, every man prefers plenty of room so that he may expand his domain as his family increases. Mohammedan law requires that each wife shall have a separate room. Among the Watumbatu she gets a separate house, instead of an addition being made to the original house. House-building and everything to do with it is the man's work. Families live together, and as the children grow up they build houses for themselves and their wives.

Houses are rectangular, never round, with sloping thatched roofs. They contain three rooms: one reception room (*sebule*), one bedroom for the

*Insufficient stress has been laid on the power of work possessed by the Watumbatu. They are excellent porters for a short distance from their homes, magnificent seamen and very rapid weeders. In fact in all labour they surpass the Wanyamwezi. They can adapt themselves to all kinds of conditions and are great travellers, to India and the mainland of Africa, and one travelled with his master to Mauritius and Aden. He is the best servant I have ever seen.

husband (*chumba*) and one bedroom for the wife (*ukumbi*). The wife lives in this room and retires to it when her husband is entertaining guests. There is little ventilation, as the Watumbatu, in common with other Africans, prefer to sleep in a close room. At the back of the house there is a yard where the wife may do the cooking.

Materials used for building houses vary according to the resources of the place. Thus, in Kijini there is abundance of hardwood and no clay suitable for building. Hardwood is therefore used for the framework and stems of elephant grass for the walls. Where no coconuts grow sword grass is used for the thatch. But the most usual materials are mangrove poles for the framework, red earth for the walls and plaited coconut fronds for the thatch. The framework consists of poles set vertically and then crossed horizontally by other poles. The yard is fenced with unplaited coconut leaves or, where these are not obtainable, with the stalks of elephant grass. Cement is rarely used, except either for mosques or water-tanks.

Hen houses are made of coconut fronds or of mud and wattle. The only examples of enclosures for goats which I saw were in a district where a leopard was operating.

The furniture in a house consists of beds with wooden frames and pieces of coir rope stretched across (*kitanda cha maiowa*), with, sometimes, chairs and a table. Lighting is provided by hurricane or vapour lamps. Before their introduction, lamps were made of clay and were heart-shaped. Coconut oil was used in them, and castor seeds were used for candles. When a bed has become dirty it is put out at low tide and left till the sea has washed over it several times. It is placed upside down and in order to keep it in position heavy stones are laid on it.

The dress of the Watumbatu is similar to that worn by other coastal natives. In men it consists of the long shirt which reaches down to the ankles and is called a *kanzu*. Under this is worn a pair of shorts and possibly a vest; until recently no shoes were worn, but these are now coming in. Over the *kanzu* a coat may be worn or a cloth robe called a *joho*. Women wear large and bright coloured kerchiefs, wound round their bodies. Over this they wear a veil called a *buibui* which is made of silk and is black; if required it can be drawn over the face. Children wear much the same dress as adults. Both sexes have a dread of being seen naked and are unwilling to name the *pudenda*.

V.—RELIGION AND MAGIC

The Watumbatu are very devout Mohammedans of the Sunni sect and declare that they brought their religion from Shiraz. There are two curious customs which require mention. One is that on Tumbatu Island and in some of the villages on the main island, women are allowed to worship in the same mosque as the men, but are screened off by a curtain which runs down the middle of the mosque. It is an illustration of how acute the late Major Pierce's

observation was, that he guessed that a part of the mosque at Makutani had been set off for the use of women. This custom is by no means universal among the Watumbatu, and one much respected man of the tribe held up his hands in horror at the thought. Those who admitted its existence and were not shocked attribute its origin to lack of space. But this does not appear to be likely when a portion of so ancient a mosque as Makutani was set apart for this purpose. It would rather appear to be a literal interpretation of the Prophet's teaching to treat women kindly.

The second custom is that of keeping an extra fast. During the month of Shawwal the Watumbatu fast for three days in the week. I never discovered the origin of this fast which is called *Ramadhani Ndogo* (Little Ramadhan).

It is extraordinarily difficult to get information about magic. The reason is that the leeches (as Dr Rivers would have called them) are in competition with the government dispensers, and it is therefore not unnatural for them to fear molestation on the part of all government officials. Koranic texts and amulets are used as cure and prophylactic respectively. Exorcism is resorted to in cases of delirium, when it is believed that the patient is possessed. Exorcists are endowed with hypnotic powers.

There is an almost universal belief in lycanthropy; both Arab and African are certain of its existence. Not only the leopard but the trapper as well is feared. The result is that leopards lead a very pleasant life because trappers are few and far between and no one else will kill them.

Only one case of magic being used for anything like a sinister purpose came to my notice. It was that of a husband who used a charm to keep his wife faithful and prevent her from stealing his money. The charm consisted of two halves of different coconut shells with some small bits of wood tied up in purple cotton inside them. It was laid under her bed and caused her the most intense fear. I have heard it said that when a man wants a charm such as this he has to apply to the Wahadimu for it.

The Watumbatu have been given a quite unnecessarily bad name for the practice of the black art. I base this assertion on the absence of any evidence to prove the contrary. The fact of the wife afflicted with black magic by her husband coming to me rather than going to a native doctor, is evidence of the absence of any regular practice of the art. It is almost invariably the case that where there are practitioners there are people capable of counteracting their ill-doings. Lastly, their devotion to their religion seems to argue against such practice. But it must not be forgotten that the enquirer into these matters is up against a blank wall of reticence.

As will be seen in the section on occupations there is no caste system, and it may be therefore said that the doctors of the Watumbatu have no standing above that of other craftsmen. Everyone has a lively belief in the existence of evil spirits and as a result those who have to deal with them are protected by wearing an armlet on the left arm. This is made of string and I was once able to see one. It must not be touched by anyone.

VI.—SOCIAL ORGANIZATION

(a) *The Tribe*.—Although the Watumbatu consider themselves as a corporate body, they have no single chief and there is the barest sketch of any hierarchy. Generally speaking it is the older men who have command in the communities. But there are no sanctions to their authority. The rule may be laid down that the remoter the district from the town, the stronger the discipline of the old men. Thus at Nungwi, the extreme northern point of the island of Zahzibar, no important decision is taken without the consent of the old men. Personality is a strong factor in the amount of control possessed by the oldest man in the village. Thus at Chongowe the headman invariably got his way, while at the other end of Tumbatu Island, outside assistance was continually being called in. The general rule seems to be that old age is respected for itself and its advice followed within certain limits.

When a man reaches such an age that his opinion is no longer of much value, it simply is not asked, and he is left to himself except that he will, if necessary, be cared for by the community. Such men are known as *Si watu* (Not People). There is no disrespect in this name, rather the contrary. The possessor of it is more or less in the position of an old-age pensioner and has gone a step further on the way of humanity; in fact he is no longer wholly human as part of his spirit has departed.

(b) *The Family*.—The system of relationships among the Watumbatu is the classificatory. Every contemporary is known as brother, the word *hasa* (special) being added to denote a blood-brother; every person a generation above the speaker is known as father or mother, and every junior is known as daughter or son. The following is a list of the names of relations:—

Father : *Baba*.

Mother : *Mama*.

Father's elder brother : *Baba Mkubwa* (big father).

Father's younger brother : *Baba Mdogo* (little father).

Father's sister : *Shangazi*.

Mother's sister : *Mama Mkubwa* or *Mdogo* as the case may be.

Mother's brother : *Mjomba*.

Grandfather : *Babu*.

Grandmother : *Bibi*.

Son : *Mwana* or *Mtoto*.

Daughter : *Mwana* or *Mtoto*.

Husband : *Mume*.

Wife : *Mke*.

Brother's wife : *Wifi*, used by both males and females.

Brother : *Ndugu*.

Eldest brother : *Kaka*.

Eldest sister : *Dada*.

Sister's husband : *Mkwe*.

Although words exist in Swahili to describe grandchildren, the Watumbatu do not use these but prefer to describe them as sons' sons and so on. The words *baba*, *mama* and *ndugu* are used in a wider sense than that given here. Thus *baba* means a friend who is senior and is sometimes used of Europeans; *mama* is used in a similar way, but never of Europeans, and *ndugu* means any member of the tribe. The highest mark of respect is *bibi*, which is used in addressing European ladies; *mtoto* is used to denote a substitute or subordinate.

The old, in return for the respect given them, must render certain duties to the younger men. In the event of a father of a family dying the care of them will devolve on the father's brother. The eldest brother and sister have certain duties towards the younger ones, looking after them when the parents are busy, and should no one of the parents' generation be alive after the parents' death, they take the place of the parents. Widows return to their people or if they have no relations they are looked after by the husband's family.

The Mohammedan rules regulating marriage are most strictly adhered to, and a breach of them appears to be about the worst thing an Mtumbatu can do. In considering such offences intention plays no part. Outside his blood relations every child is given a *Walii*, whose duties appear to be similar to those of a godfather under our rules.

(c) *Life-Cycle*.—Any account of the ceremonies connected with the life-cycle of the Watumbatu must of necessity be incomplete. One and all are singularly reticent about anything connected with magic, and many of these ceremonies have a good deal of magic about them. The only way, therefore, to find out about them is personally to see them. Moreover, the ceremony of birth is an affair for women only, so that it is not likely that a white man will get any reliable account.

The important dates in the life of a Mtumbatu are only birth, circumcision, marriage and death.

Childhood among the Watumbatu is a very happy time, for one and all love children. The children are timorous and run at once from a stranger, especially if he has a white face. Education begins as soon as the child has any perceptions, for he is taken at once to the fields on his mother's back. Education in parts where there is little cultivation begins of necessity at a later age. At Nungwi the children begin to sail boats when they are about five or six. As these boats are perfect models they get a very good idea of how to manage the real thing. When the child is about seven years of age he is put to the Koran school, where the book is learnt by rote and the intonation perfected to an alif.

Circumcision of the boys—never of girls—takes place at about the age of eleven. Usually the season is that of the north-east monsoon. Previous to the operation the children are segregated and are allowed to see no women. According to my informant the operation is performed in private inside a hut. After the operation the children are given new clothes, new names and money to

distribute as largesse. A dance is held, called *Manjuguu*. Immediately before the operation the children bathe naked in the sea. Thenceforward they are able to marry and are considered responsible persons.

Previous to circumcision their position may be compared to that of the very old, not quite as others. Thus a boy before his circumcision is called *Nwanakele*, and a girl before she is nubile *Mwanamwari*.

As soon as possible after reaching puberty both sexes are married. This is usually negotiated by the man himself and is dependent on his having enough to pay the dowry. Pre-marital intercourse is not allowed among members of the tribe, though there is no objection to men satisfying their appetites with women outside the tribe. Until marriage women are kept in the severest seclusion. Children appear to be segregated from the age of about four or five.

Polygamy is allowed within the limits of Mohammedan law, and depends only on the capacity of the husband to pay.

Marriage is celebrated by a dance which I was never able to witness. In fact on the only occasion when I did see it the performers took great pains to hide themselves from me. From the little I did see I should say that it is concerned with driving away, with the maximum of noise, the evil spirits which might vex the happiness of the couple.

Death is regarded as the necessary end of life and in no wise an evil. It is the occasion of a feast which may last several days.

(d) *Position of women*.—It is difficult at first to fix the position of women, but it soon becomes clear that there is a definite system in force which combines Mohammedan law with the usual Bantu customs.

Women are the drudges of the household and the slaves of their masters; they must keep well out of the way when he is entertaining guests. The tasks allotted to them are keeping the house clean, cooking, fire-making and pounding corn. They also share with the men the work to be done in the field. Other work done by women includes making pottery and catching whitebait and octopuses. There does not appear to be any limit to their activities and their primary function is to help their husbands in any task, particularly the more disagreeable ones.

A woman in her courses may not leave the house. When she is in labour she may not be helped by her husband, but is assisted by a midwife (*mkunga*). Midwives are in all probability a special class.

The degree of segregation varies, apparently at the will of the husband. In Tumbatu Island the degree of segregation is terrific and is pushed to such a point that the women are not allowed to reach the shore by the same path as the men. On the other hand on the main island of Zanzibar women may not infrequently be seen sitting on their doorsteps and may pass the time of day with men.

Women are, however, considered to have as good a chance of salvation as men and, though I never actually saw a mosque reserved for the use of women, the existence of women's mosques is possible. There is at least one Koran school for girls (at Nungwi) presided over by a woman teacher.

In the choice of a husband women are restricted to their own tribe. "Choice" is the wrong word but there is no other. But as men seldom go outside the village in their choice single blessedness is the exception.

Throughout her married life woman is dominated by the threat of divorce, which is governed by Mohammedan law. This has the effect of keeping her faithful. The standard of morals is therefore high in districts which are inhabited largely by Watumbatu, but varies inversely with the approach of the urban civilization of Zanzibar.

(e) *Greetings*.—The Watumbatu are not a ceremonious people and do not willingly greet a stranger and will return his greetings in rather a surly manner. This is a sign of both shyness and desire to show independence.

The first greeting of the day is *Sabalkheri*, a corruption of Arabic, and means literally "Good-morning." It is, however, used at any time of the day or night. *Jambo* is the word used for inquiring as to the health of a person. The answer is *Sijambo* or *Alhamdulillahi* ("I am well and praise be to God"). It is not quite true to say that the answer to enquiries as to health are always answered by saying that your health is good. This is the answer invariably given to Europeans, but I have heard men reply "I am not very well." *Kef halek* and *Kef hal* (Arabic for "How are you") are answered by *Tayyib* (Arabic for "well"). Women are greeted with *Shkamo* (*Shika mo'o* or "I hold your feet"), to which I do not know the answer. Children greet their elders with *Shkamo* to which the answer is *Marahaba* (Arabic "Thank you" or "Very well").

When anyone wishes to enter a house he cries *Hodi*, and if the owner is in, he replies *Karibu* ("draw near"): or the answer may be *Hodi nani* ("who is hodi-ing?"). *Hodi* is often shortened to *hod*. When the owner has said *Karibu*, the person who wishes to enter says *Starehe* on entering. This means that the owner is not to disturb himself. Should *Starehe* be said before a man enters, it means that he does not wish to enter.

On meeting for the first time after a long while, it is usual to ask for the news. To this enquiry I have never heard any reply save that it was good, with often an *Alhamdulillahi* added.

James Frederic Elton

By F. B. Wade

IN THE most recent issue of the handbook of the Royal East African Automobile Association, some notable dates of events in the early history of this Territory are given. In this very useful handbook the earliest date recorded is 1505 when Kilwa was first occupied by the Portuguese. Then follows a succession of dates relating to the spread of the Arab influence in the Territory, until in the year 1858 we read that Burton and Speke discovered Lake Tanganyika. Other renowned explorers of the period (all British names) are recorded including such well-known figures as Livingstone and Stanley. The last pioneer to receive mention is Thomson who explored Lake Rukwa in 1878.

The first record appearing in this handbook of the entry of German influence into the Territory is in 1889 when a German Protectorate was declared over it.

While the source of the above-mentioned historical information may not be unimpeachable, it is a widely read publication in East Africa and may reasonably be assumed to represent the knowledge of the average person on the subject of early East African history. If this assumption be true, it is clear that by omission an injustice is being done unwittingly to a man who should rank with the foremost of those intrepid explorers of "Darkest Africa." This man was James Frederic Elton.

The purpose of these notes is to attempt, after a lapse of sixty years, to place before our readers an appreciation of this explorer's arduous toil in this Territory in a journey of discovery that culminated in his death near Iseke in Ugogo one hundred miles from Dodoma, the present-day capital of the Central Province.

James Frederic Elton was born in 1840, and his brief but eventful life was brought to a close at the above-mentioned place in 1877. During that stormy period in the history of our Empire he saw active service with an Indian regiment in the Mutiny campaign. In 1860 we find him a volunteer in China where, with the rank of captain, he assisted in the capture of Peking. In 1866 he joined the staff of the French army in Mexico and recorded his experiences in that country in a work entitled "With the French in Mexico."

Notwithstanding a short life crowded with adventurous incident, his desire for travel was as yet unappeased, and in 1868 his experiences in African exploration began. These took him into Natal and among the Zulus and also further north where he made a valuable survey of the Limpopo river. Nor did he confine his energies to exploration of the wide open spaces only, for in 1871 we find him undertaking official work amongst the gold and diamond diggers, and also engaging in some delicate negotiations with the Portuguese.

Becoming a member of the Executive and Legislative Councils of Natal, he took an interest in the slaves that had been released in Durban by the Royal Navy. These wretched people had mostly come from what is now Tanganyika, and sympathy for them induced Elton to accept in 1873 an appointment from Sir Bartle Frere as Assistant Political Agent and Vice-Consul at Zanzibar. Two years later he was promoted to the post of British Consul at Mozambique.

During his tenure of these appointments he performed not merely lip-service to the suppression of the traffic in slaves but actively engaged himself in safari-work along the East African coast from Mozambique to Mombasa. During these safaris he often obtained the release of many slaves by force of his personality alone, for, officially, he possessed very little authority when travelling amongst those somewhat turbulent subjects of the Sultan of Zanzibar living on the mainland. During these unpleasant tours along the coastal belt he seems to have received some assistance in the matter of "secret service" from the British-Indians already established there as traders, although these merchants were often deprived by him of the slaves they already possessed.

While these journeys resulted in the freedom of many Africans, Elton quickly realized that in order to deal really effectively with this objectionable traffic, it should be traced to its source and there attacked, and this led him to engage upon his last safari. The shores of Lakes Nyasa and Tanganyika were at that time the hunting-grounds of the Arab slavers, and Elton chose to investigate the southern lake area first. This was the more practicable in the time at his disposal for he would be able to use the route already established by the British missionaries in what is now known as Nyasaland, and thus be able to attack the problem in the flank in accordance with good military practice.

Accordingly, on the 12th October 1877 he landed amongst the Wakonde at the northern end of Lake Nyasa and made his entry behind the scenes into what is now Tanganyika Territory. The route followed by him is depicted on the frontispiece of this issue, drawn by Mr E. Harvey. Elton's journey was relatively uneventful after leaving the shores of the lake, and during the latter half of October 1877 he ascended steadily into the high country in the neighbourhood of present-day Tukuyu. Thence he followed a path that led to Merere's country through a pass in the mountains that now bears the name of Elton, although he referred to it as "Mazote's Pass." Here he waxed somewhat lyrical at the splendour of the scenery as the following extract shows :

"The country we have passed through is without exception the finest tract of Africa I have yet seen. There is nothing to equal it either in fertility or grazing land in Natal, the reputed 'Garden of South Africa.' It consists of chains of elevated valleys, three to five thousand feet above the sea, characterized by undulating slopes, and dotted over with pyramidal hills, the entire district being bounded to the east by the continuation of the 'Livingstone' range"

Notwithstanding his keen appreciation of the scenery, his sound commonsense is displayed in an adjoining page of his notes thus :

“And against colonization there stands the fact that a great extent of the land in every direction is already taken up by natives, and is either under cultivation or pasture-land stocked with cattle. Probably it is wastefully occupied, and spare elbow-room might be found. But native ideas of land-holding are very enlarged, and it is probable that European colonization might lead to grave misunderstandings.”

After surmounting the pass on the 26th October (recorded by him as eight thousand, eight hundred and forty feet above sea-level), he traversed what is now known as Elton Plateau, and then commenced the descent into the plains at the head of the Great Ruaha valley, an area dominated by that African potentate Merere, whose fame at that time was widespread throughout eastern Africa.

To his dismay Elton found Merere engaged in serious warfare with the neighbouring Machinga (a portion of the Yao nation). Against his wishes he assisted Merere in repelling enemy attacks, and he also supplied Merere's garrisons with fresh meat obtained from the numerous herds that occupied what is probably now known as the Buhora Flats. The insanitary conditions of life in this chief's principal *boma* during this period most probably laid the foundations of the illness that was a short time later to end Elton's career, for he states that even the hyenas were fastidious of normal village refuse since they were usually fully gorged on human remains obtained from the casualties, it being the unpleasant custom of the Wasango not to bury their dead nor to succour their wounded. They were also in the habit of killing prisoners and displaying their remains to the foe.

After nearly a month's enforced delay in unpleasant surroundings, we find Elton at last continuing his journey. He now found that his official duties at Zanzibar called him more and more insistently, and he had reluctantly to give second place to his investigations into the slave trade. On the 25th November, however, he fell in with a Baluchi trader outward-bound from the coast, who told him the gratifying news that the slave-trade on the coast was now quite rigorously prohibited : news that must have compensated him to some extent for the enforced abandonment of the quest that lay nearest his heart.

From now onwards his notes are mainly concerned with the provisioning of his caravan. Food seems to have been scarce even away from Merere's devastated country, and Elton and his companions, Cotterill, Hoste, Downie and Rhodes, spent most of their time (when they were not being carried owing to sickness) in “shooting for the pot.”

At the beginning of December the explorers found themselves in the Niam-Niam country, most of which was deserted, since its inhabitants were either in service with Merere's forces, or were in the Ukinga mountains with the cattle they had saved. About this time there appears in his notes the first statement regarding shortage of stores. “. . . No salt, sugar, liquor or biscuit.

We live on 'mayere' porridge—a substance resembling a coarse poultice. Liebig has been a great stand-by to us."

To add to their troubles a shortage of water was experienced in the neighbourhood of the camping-place Pambagora; and even when they had reached the Msombe river they found only green stagnant pools, polluted by game and scarcely sufficient to fill their cooking-pots. On the 7th December, however, one of their troubles was removed by the onset of the first rains, and it is interesting to note here that Elton's spirits too seem to have been refreshed by the rains, for he writes: "I am very well bodily, but thin; and I can still go, and am better than anyone else at present, thank God!"

A week later he was too weak to write his diary, and the Consul's last entry on the 13th December was characteristic: "Dull morning. Feeling better, and hungry. Had the yard swept up. Everyone a little better."

Cotterill now seems to have assumed charge and pushed on with his sick companions Elton and Downie, both in hammocks, towards the Kisigo river where they were obliged to halt while messengers went on ahead to Useke to announce their impending arrival. After they had entered Useke, Elton assured his companions that he felt quite well, but next morning he collapsed in convulsions which thereafter attacked him every few hours until in the forenoon of the 19th December his indomitable spirit left his struggling body.

Poor Cotterill's troubles were not yet over. The local Wagogo, possibly owing to superstition, would not permit Elton's remains to be buried near their gardens, and so after some delay his last resting-place was chosen about three miles along the Kisigo track underneath a prominent baobab tree.

A monument has been recently erected on his grave. The burial-place had long been tended by the Wagogo, and it was stated that a former District Officer, Mr Hilpern, had visited it and had caused a thatched roof to be built over the mound. This roof was now removed and replaced by the monument, a plinth surmounted by a broken column to symbolize a career cut short.* It was erected in November 1938 as a result of the efforts of the under-mentioned admirers of the Consul's devotion to duty and unswerving loyalty to an ideal, the achievement of which during sixty years has brought happiness and a measure of comfort to the native inhabitants of this Territory.

To Mr Frank Oates, M.B.E., is due the idea of commemorating more suitably the explorer's lonely grave. His possession of Elton's posthumous book entitled "East and Central Africa" published in 1879 by John Murray, London, formed the basis for these notes. Mr E. Harvey designed the monument, Mr L. Ellero skilfully constructed it, and Messrs F. J. Lake and F. B. Wade were responsible for its installation.

The grave, situated ten miles to the south of the present chief's principal village at Iseke (six degrees twenty-seven minutes south, thirty-five degrees east) is now accessible by motor vehicle during the dry season.

*The author's photographs illustrating the monument will be published as the frontispiece in the next number of *Tanganyika Notes and Records*.

NOTES

Salt Production Among the Wasambaa

THE following note on salt production among the Wasambaa may be of interest when compared with the article on production in Sukumaland by Mr Senior in the December 1938 number of *Tanganyika Notes and Records*, in that it shows another of the ways by which the African obtains this all-important mineral.

The Wasambaa—the name for present purposes includes all the inhabitants of the Western Usambara Plateau, that is, the highlands of the Tanga Province lying between the Luengera river on the east, the Uмба river on the north and the Mkomazi river on the west—have never manufactured salt in their hills though patches of salt-encrusted earth exist therein.

Before the coming of the European they used to make the journey to the coast at Tangata just south of Tanga and barter their bananas and maize for the salt of the Wadigo. To-day, too, the manufacture of salt at Tangata continues; but the Wasambaa do not go so far afield. In the plains to the north and west of the Usambara escarpment are deposits of salt and these are worked by the local inhabitants and other natives who come from varying distances to dwell near the site for periods ranging from one to three months. The method of working is always the same. That described in this note was observed at Makayo village, approximately one mile south of Lake Kalamba through which the Mkomazi river runs on its way to join the Pangani, about half-way between the Pare and Usambara escarpments. Other deposits are at Mkomazi, Mazinde and Mombo near the east bank of the Mkomazi river but in lower reaches than Makayo. This latter village is a collection of wattle and daub huts thatched with grass or banana leaves and scattered over an area some half a mile square. Deciduous scrub and thorn clothe the surrounding steppe which is waterless except for the Mkomazi river and a few intermittent wet season torrents from the Usambara scarp. The soil is reddish, very friable in the dry season, with a heavy deposit of salt that is clearly visible as a white rind during the rains. The dry season, May to November, when the calls of cultivation are less insistent, is the main period for working the salt. The village is then crowded with Wapare and Wasambaa, totalling sometimes two hundred men, women and children; for whole families migrate. Indeed the whole process of manufacture, including the collection of the earth, is the women's task though an occasional lone male may be found at work.

Earthenware pots have their bottoms removed and replaced by a lattice-work of sticks covered over with banana or coconut fibre acting as a filter. A frame-

work of sticks holds from six to eight of these pots in a row about three feet from the ground. Underneath these pots is a runnel of bark sloping from one end down to a receptacle—either a kerosene tin or another pot—on the ground. The pots are then filled with salt-laden earth. Water is then added and drips through the runnel into the receptacle on the ground. Its first fruits are tinged with red earth. They, therefore, are returned to the upper pots and the process is repeated until the contents of the lower pot are completely clear. These are then taken into a hut and the water boiled away until only pure white salt remains at the bottom of the pot.

There would appear to be no restriction on the use of these salt beds. The country, though nominally in Same district, is a no-man's-land, and rarely visited by district or tribal authorities.

The migrant manufacturers take their salt home and either sell or barter that in excess of their own requirements at their home *gulios*—local uncontrolled weekly marts. At Makayo itself there are two *gulios* where natives from the Northern Usambaras or Eastern Pares barter, the former maize, potatoes and bananas, the latter maize, rice, coconuts and fish, for salt. This activity continues until the rains in December. The village is then left to its own inhabitants, perhaps ten families, and the white rind spreads untouched over the red earth.

BOOK REVIEWS

*"The Rape of the Earth," by G. V. Jacks and R. O. Whyte. London, 1939, Faber and Faber, Limited.**

The authors who, under the auspices of the Imperial Bureau of Soils, have recently given us a most useful review of the state of soil erosion throughout the world and who as students of the soil are at long last trying to blow up the fortress of thought hitherto manned predominantly by politicians, financiers and theory-ridden economists, have now produced this masterpiece. It deals not only fully, and again throughout the world, with the physical, historical, technical and economic aspects of erosion accelerated by *homo sapiens*, but leads the reader deep into the philosophy, into the very spirit of this appalling result of the spread of succeeding civilizations into new regions of the earth, and attempts, on the whole successfully, to find a way out of the mess by a careful analysis of its historical and social causes. In doing so they show authoritatively how civilizations have fallen or, as for example, in the case of China, are falling through the repeated neglect of the very foundation of all life, the land.

It is impossible, even in a lengthy review, to do justice to a book which on every page—in every line almost—bristles with statements of the most far-reaching importance and which is full of many gems that in bold print ought to adorn the walls of every office, study and bedroom all the world over. And we in Africa should particularly reread chapter XX at regular and frequent intervals. One is greatly tempted to quote profusely from among these gems of thought, but lack of space only permits to give a few of the most striking ones. Thus, on page 19 we read: "Soil erosion is altering the course of world history more radically than any war or revolution." On page 36: "Erosion and erosion control are essentially problems relating to the maladjustment of human communities to their environment, that is, they are fundamentally problems in human ecology." "The only way to combat erosion is to work faster than it does, and this becomes increasingly difficult as time goes on" (page 82). "When the user of the land speculates he is up against much bigger odds than the financier, and a more dangerous fellow to the community at large" (page 93). "Wherever the soil-conservation side of agriculture has been neglected for the sake of economic opportunity, its reintroduction will mean that somebody must suffer a reduction in immediate profit" (page 109). "An outstanding feature of the modern outlook on soil-conservation is the emphasis laid on the superior value of biological, as compared with mechanical, control" (page 111). "It is for the Administration to act not through the slow process of education but by the introduction of measures directed towards the early removal of the adverse factors" (page 176, a citation from Professor Stebbing). "Having to a certain extent tamed the native races the only justification for the European to remain in Africa is to tame the vegetation" (page 249). "What better use for South African gold could be found than to bury it again in the surface soil" (page 266). And finally: "When the struggle for existence ceases to be a struggle for markets and becomes a struggle for water, the power of the country in relation

*This review has also appeared with the consent of the Editor of *Notes and Records* in the *East African Agricultural Journal*.

to that of the towns will increase. The men who rule the rivers according to the way they manage the land, will rule the nation" (page 297). And so on throughout the pages in ever varied, ever logical succession!

The wide realization of the dangers of soil erosion made apparent in the book, of its causes, extent and of ameliorative or protective measures taken or contemplated, is of necessity largely based on official publications. If in some cases, as for instance in Tanganyika Territory, the seriousness of the situation is, in the reviewer's opinion, not sufficiently emphasized, no blame for this can be attached to the authors but rather to too favourable reports. Thus, for instance, it is not very helpful to minimize the dangers because soil erosion is only noticeable in one-tenth of the land (page 69), the remainder being looked upon as land reserves. For not only does this figure not coincide with the facts, if account is taken of the rapid spread of as yet "occult," incipient deterioration, but the so-called reserves are not reserves until ways and means can be found to provide water and to drive out tsetse and tick. That we are still far from this desirable goal no one should dispute.

The work, its often gruesome facts notwithstanding, strikes, on the whole, a note of hope and thereby counters the easy slogan of the indolent defeatist who is wont to appease his conscience by saying: "If soil erosion really exists" (there are still far too many who doubt its existence!) "then mankind must either die rapidly of starvation or a little more slowly of erosion." It does so by emphasizing the possibilities of final victory over Nature through research in every direction and more particularly of ecological studies, in order to learn all there is to be learned about the stages of both natural and man-created succession of plant communities; and through applying the results of such research, if necessary, by revolutionary processes that would better adapt the ever-growing masses of humanity to the dictates of soil fertility. That mere reliance on artificial fertilizers is not a panacea against soil mining, and that many fundamental changes in land tenure must be brought about, is made amply evident.

Chapter XIV, with its lucid statements regarding the primary importance of water conservation, particularly and quite naturally pleases the present reviewer by the authors' thorough understanding of, and their constantly recurring emphasis on the interrelations between soil, water and vegetation, incidentally endorsing fully his own views in a field he has, long since, made his own.

The outstandingly interesting chapters on the political and social consequences of soil and water deterioration bring out powerfully the dependence of civilized societies on securing and maintaining absolute control of water and soil, and show that for the grasslands at least, and even in such advanced communities as the United States of America, a return to something like communal or collective planning and land tenure may become inevitable. This will, no doubt, provide food for thought to those who believe in a development towards individual land tenure and away from firmly established collectivism for the African native as a means for stemming soil erosion! Chapter XX, especially dealing with African problems, is full both of excellent truths and debatable suggestions. The "Feudalism" of a white upper stratum and African serfs which the authors foreshadow (pages 261 and 262), might conceivably take the more humane form of European guidance of free peasants by "Syndicates" of which a successful example exists at Gezirah in the Sudan, and which the present reviewer has for long looked upon as a feasible, just and promising solution deserving further experimentation.

Another point on which one might disagree is the following: Even if one grants, and it is difficult to perceive how one can do otherwise, the correctness of the notion that international capitalism, which "enriched mankind and impoverished the earth" (page 215), is primarily to blame for the unprecedented recent deterioration of the soil (chapter XVII contains many striking proofs for

this), need one therefore endorse the view that "Economic Nationalism"—in other words the totalitarian states—can and does apply the screw and is, thus, the only though admittedly "strong and unpalatable medicum." Cannot less drastic and more humanely cosmopolitan ways be found out of the apparent impasse created by the important and inevitable adjustment of a civilization born and bred in a humid and temperate environment to that of the sub-humid and semi-arid grasslands or to the even more difficult conditions of the tropics? Unless they can it may, after all and at least to some of us, be preferable "to die slowly of soil erosion." The astonishing efforts made during the last few years in the United States towards a corporate society which voluntarily accepts the restrictions of individual freedom regarding soil and water, so ably described by the authors, for example, on pages 231, 235, 242 and 296, would seem to point the way towards a more hopeful solution.

In this connection just two more queries: Would some of the totalitarian states at least, were they to succeed in regaining a footing in the semi-arid lands, really improve matters or would they not rather by the very principles of their totalitarianism suck these areas even drier and at a pace much faster than capitalism does or ever has done in Africa for instance? And do the authors themselves not rightly proclaim—in chapter XVIII which contains many valuable remarks on this subject of paramount importance—that this "world-wide problem must be tackled as a whole as otherwise soil conservers would be placed at an immediate economic disadvantage in relation to soil exploiters"? (page 222). A statement which would seem to prove that a world divided between international capitalism and economic nationalism will not solve the problem even though the latter may be gaining ground.

A consideration of the future trend of events, sketched in the last chapter, sees in the wave of nationalism that has been raging since the war the first and unavoidable phase towards a reconstitution of soil balance which, in the authors' opinion, can only be achieved by the universal terror of war. Although it is difficult to follow this argument cheerfully to the promised end, it cannot be denied that, unfortunately, there is a good deal of truth in it (pages 284 and 285).

Only mere mention can be made of the admirable expositions on erodibility (page 94), on the pros and cons of veld and forest burning (page 148), on the beneficent influence of forests (pages 159 and 160), and above all of the present and future development of grasslands, especially as planned by the Russian experiment (pages 289 to 291), the last being summed up in the truly philosophical statement: "The present civilization has desiccated the forests; the next will moisten the grasslands. We can only guess how that triumph will ultimately be achieved." The pictures adorning the book are excellent and well chosen. And only one slip has been noticed on page 68 where the dry savanna forest of Northern Rhodesia is called "primeval."

It is not going too far if one advocates that this admirable treatise should be available for constant reference to everyone concerned with the future of our civilization and more particularly to those who see salvation only in the investment of more capital the dividends on which will inevitably have to be paid, under present conditions, in loss of soil fertility. Especially European settlers of the semi-arid new-lands might take to heart the pungent but fair criticism of their "limitless optimism" and of the attitude of mind it is based on (page 292). In short, this book might well be regarded as the bible of modern man all the more so as it fits well into the story of Paradise Lost where husbanding of the soil, in the poetic language of the Old Testament, appears as "the sweat of the brow."

One feels, however, that this review, dominated as it is by unqualified praise, should not end without some stricture. It is, indeed, difficult to find cause for such, unless one enters a field of human knowledge as yet hardly scraped by the plough

of observation. If one does, one finds that no reference is made to the certain if as yet not or only very primitively understood action on the soil by radiations other than the well-known ones of light and heat, radiations of many wave-lengths which pour on to our little earth not only from its own sun, but from cosmic space. Although the anthropocentric attitude towards terrestrial processes has been thoroughly upset by the authors in all its shortsighted egotism, one would have liked to see at least a tentative attack on that geocentric attitude which has not yet grasped that terrestrial happenings cannot be divorced from cosmic influences and forces. But perhaps this minor criticism is unjust until our notions on this subject will have become more fully developed than they are at present.—C.G.

"Ancient Metallurgy," by Arthur E. Robinson, F.R.A.INST., *St Albans and Herts Architectural and Archaeological Society*, pp. 247-284, seven plates.

In this very well documented paper the author takes his readers on a visit through the smelting works operated by man from the end of the Stone Age up to medieval times. He traces the growth of man's utilization of metals from 3400 B.C., through the Dark Ages right up to the present day when he quotes as reference an article that appeared in *Tanganyika Notes and Records* in 1937 on the Tanganyika iron industry as practised in Ufipa.

Although iron is one of the most widely distributed metals in the earth's crust, it seems that it was in most lands the last to be subjugated to man's needs. Copper, tin, zinc and the rare metals were in use, chiefly as alloys, long before the technique of extracting metallic iron from its ores had been developed, although weapons made from meteoric iron were sporadically distributed amongst the peoples of the earth. In these cases such rare weapons were usually endowed with mystical characteristics. In other parts of the globe, some peoples passed from the Neolithic to the Iron Age without having experienced the benefits of the Bronze Age at all. Indeed, some branches of the human race, notably the Australians and Tasmanians never knew a metallic phase of any kind during their evolution from the age of stone implements and weapons to modern times.

The paper is abundantly supplied with diagrams of furnaces, and interesting data of their dimensions and fuel consumption are given. Charcoal seems to have been in use as a fuel for the longest period, and it is of interest to learn that industrialization even in those dim ages brought in its train economic and social problems of a high order. For instance, we learn that by the deforestation of most of Sussex and of the Forest of Dean a path was made for mixed farming to develop in those areas, while in the social sphere we learn to our dismay that while metal workers were considered estimable members of ancient society, miners and furnace-tenders were relegated to a servile class only.

The technique of furnace-operation seems to have altered very little through the ages (excluding of course the ultra-modern electric furnace). Both forced and natural draught types have been identified by archaeological field workers and, strange to relate, no better process than the production of "blooms" of wrought iron seems to have been evolved. In the realm of steel production, however, modern engineering with its higher temperature technique and controlled air supply has no counterpart in ancient history. The nearest approach to this seems to have occurred when the Hebrews sent their customary tribute to their Roman overlords of iron billets that were most probably of cast iron instead of wrought iron.

This unwise act can hardly be quoted as exemplifying the often alleged sharp practices of this much-abused race, for to produce cast iron the metal must be brought to a high temperature so that it actually melts and attains the fluid state; wrought iron, on the contrary, seldom attains more than a plastic consistency. Did the Chosen People of that era, by giving more than full measure when

working their primitive bellows unjustly incur the wrath of the tyrant power, or was there at the time a temporary glut of charcoal on the market? Our author does not venture into such speculative fields and rightly so, for the value of his paper, so very greatly enhanced by the many references to erudite works, would thereby have been depreciated.

His frequent references to the works of the eminent mining engineer Rickard, whose research into the history of mining and metallurgy is so widely known to metallurgist and mining engineer alike, is a token of the excellence of the subject-matter of the paper.

The printing and general reproduction of the pamphlet are excellent, but one small typographical error seems to have escaped detection on page 278 when the final proofing was done.—F.B.W.

"The Land Rights of Individuals among the Nyakyusa," by Godfrey Wilson, 1938. Rhodes-Livingstone papers, number 1, obtainable from the Secretary, Rhodes-Livingstone Institute, Livingstone, Northern Rhodesia, price two shillings.

In this paper, "The Land Rights of Individuals among the Nyakyusa," Mr Wilson has accomplished what he states in his preface he set out to do. He has increased the "sum of exact information upon the sociology of Central Africa."

It is difficult for the ordinary man to criticize the words of a trained anthropologist—for such is Mr Wilson. It is the anthropologist's business to produce facts and for others to accept them and use them as a basis for any modification or departure from law or custom that may be necessitated by the kaleidoscopic events to which all races are called upon to adjust themselves at the present day. This is especially the case in Bantu Africa, where some of the most primitive races of the earth have been brought into contact with an alien and highly developed civilization with a degree of suddenness which has possibly never previously occurred in the world's history.

The test of the accuracy of the anthropologist's recorded studies is the degree of reliance which the administrator, planter, missionary, etc., finds he can place in them when he comes to make practical use of them.

Having said that and having some knowledge of the people and country with whom Mr Wilson treats in this paper I feel that the information it purports to contain will, in almost all respects, stand up to the test and it is to be hoped, therefore, that it will be given a full trial.

Mr Wilson's treatment of the subject of the ownership of land in relation to agriculture is admirable but one is inclined to doubt his unequivocal statement that the "*chitemene* system of agriculture so common in Central Africa has never been practised by the Nyakyusa, indeed the density of population makes it impossible." On the contrary there is no reason to believe that the Nyakyusa, in common with most if not all of Bantu Africa, did not in the past practice this system of agriculture. It is more reasonable to incline to the supposition that increasing numbers have tended to pin them down to the more intensive system of agriculture which exists at the present.

Mr Wilson's statement presupposes that the Nyakyusa country has always been densely populated but this can hardly be the case and in contradiction of it he goes on to describe in another part of his paper how the custom which requires that a chief shall divide his land inheritance into two is falling into desuetude "now saturation point has been reached." The inference is that in the past the country was more lightly populated than at present and this inference is probably correct.

It is interesting to note that the Nyakyusa habits and customs in relation to land as recorded by the author tend to show that the tribe follows those customs which are in principle common to other Bantu tribes in spite of its geographic isolation. The variations in custom are in degree only, dictated by geographic conditions rather than ethnological differences.

One would have liked to have seen a little more recorded regarding grazing rights. Mr Wilson has stated that "pasture, unlike garden land, is jointly owned by the whole village group and no individual has any exclusive rights to any portion of it" and that, therefore, a detailed discussion of grazing rights falls outside the scope of this paper. This may be true but if the picture is to be complete we must know to what extent grazing does constitute a right to the use or ownership of land. It is known, for instance, that at certain seasons of the year many Nyakyusa drive their cattle out of their own tribal area to graze on the Elton plateau on top of the Livingstones. Is this a recent occurrence? What is the reason? Is it because all available home grazing is already parcelled out? There are a hundred and one questions which could be asked and we hope that in time Mr Wilson will supply the answers. May we also ask him to give us any information he can regarding honey rights and forestry rights?

There is so little that can be adversely criticized in Mr Wilson's paper that we can only ask for more and look forward to the publication of the further paper on the land rights of groups of persons in relation to one another which is promised in the introduction. In the meantime this present publication will not only be found useful by those working amongst the Nyakyusa but by those working among kindred tribes.—P.M.H.

"The Study of African Society," by Godfrey Wilson and Monica Hunter, 1939. Rhodes-Livingstone papers, number 2, obtainable from the Secretary, Rhodes-Livingstone Institute, Livingstone, Northern Rhodesia, price sixpence.

This useful pamphlet has been written to assist the beginner in the collection and arrangement of material on native social life and start him properly on a study which is as interesting as it is important. "Social anthropology," say the authors, "is an ideal hobby; it is also one of the most useful pursuits that a man or woman can engage in, for accurate information upon the changing customs of the African natives is all too scarce. And only upon a basis of accurate information can any wise and enduring native policies be built."

The pamphlet stresses the need for the student to distinguish carefully between the observable present and the remembered past; ("many eminent writers have failed to do this, partly, no doubt, because informants so often muddle the two;") the need for a thorough understanding of a tribe's social system; the danger of concentrating on the bizarre in African life and neglecting the study of more important matters such as housekeeping and agriculture.

A section on "Description and Explanation" then urges the necessity for clear definition and the avoidance of fanciful hypotheses which ignore the African's own explanations of his doings. "Vague and inappropriate descriptions of fact are all too common in anthropological works. The word 'witch-doctor,' for example, is not infrequently used by the same writer in half a dozen senses, only one of which it is really fitted to express, namely, a doctor who engages in witchfinding, who is believed to protect his community by picking out the witches who are destroying it." "The best hypotheses [to explain behaviour] are those suggested by the people under observation, for they have the greatest initial probability; the next best are those which have been proved true for similar facts in other areas by other students; the least likely are those thought out by the student himself."

Lastly, the authors insist on the need for detachment and objective understanding in the social scientist. "Judgment and passion may follow, they cannot mingle with science except to distort it."

The pamphlet has already had some circulation among officials in this Territory; it is worth reading by all those interested in the peoples among whom they live.—E.E.S.C.

