

# TANGANYIKA NOTES AND RECORDS

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# Tanganyika Notes and Records

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## **In Memoriam — Geoffrey Milne, M.Sc.**

ONCE MORE inexorable and cruel fate has torn from our midst, unexpectedly and prematurely, one whom we can ill spare: at Nairobi, on the 16th January 1942, GEOFFREY MILNE, the Soil Specialist of the Amani Research Station, succumbed in a few hours to a dread acute inflammatory disease against which medical science is as yet helpless.

Born on the 5th August 1898, at Hull, as the second son of Sidney Arthur and Edith Milne, he was educated at Hymer's College, Hull, and at Leeds University, where he took his B.Sc. degree, first class with honours in chemistry in 1921, and his M.Sc. in 1924. During the Great War he served in France with the King's Own Yorkshire Light Infantry and the Royal Engineers from 1917 to 1919. From 1921 to 1923 he was Assistant Lecturer in Agricultural Chemistry at the University of Aberdeen and from 1923 to 1928 Lecturer in the same subject at Leeds, becoming a Fellow of the Institute of Chemists in 1928.

In the following year, at the age of thirty, he was appointed Soil Chemist at the then recently reorganized East African Agricultural Research Station, a post which he not only filled but, in the best sense of the word, adorned until his death. From his laboratory high up in the Usambara Mountains, during his many safaris through the dependencies he served, and on prolonged study-leaves to attend Soil Congresses and to co-ordinate the progress of his science in far distant lands with East Africa's more local problems, he rapidly built up a sound foundation of knowledge for the base of life of all of us, our East African soils. Through close co-operation with his colleagues in the adjoining territories, and by making the best possible use of observations by laymen which—contrary to the prevailing trend of scientific specialists—he did not suspiciously or jealously despise, but encouragingly accepted, he was able to lay before the world in 1936 a first *Provisional Soil Map of East Africa*, which will always remain a monument to his searching mind, his far-flung knowledge, his untiring industry and his skill in scientific exposition. And his beautiful and instructive exhibit of representative soil types in the Dar es Salaam Museum will stand as a lasting memorial to his loving and careful attention to detail.

But there was much more in Milne's work than these attributes of the scientific worker: a rare power of seeing beyond his special limited realm, of making his branch of research dovetail with other branches; a depth and width of insight which, coupled to a particularly vivid synthetical sense, made

him probe deeply into the philosophical foundations of soil science, and thereby raised him high above the average worker in the estimation of those who care for a broad and universal understanding of nature rather than for a narrow-minded groping along limited furrows. This attitude runs like a red thread of hopeful enthusiasm through all Milne's papers and reports, through a precious collection of personal letters, through the equally precious memory of his fascinating talks and discussions, and stands out prominently in those gems of scientific writing, his *Essays in Applied Pedology*, which he contributed to the *East African Agricultural Journal* in 1937 and 1938. That this universality of outlook was fully appreciated by his fellow-workers in East Africa is shown by the trust put in him when, in 1940, the Pasture Research Conference at Nairobi asked Milne to undertake the arduous and delicate chairmanship of a committee to draft a Vegetation Map of East Africa; a long over-due requirement the early achievement of which has, one must fear, once more been retarded by this shocking capriciousness of fate.

It is, thus, no exaggeration if those whose privilege it was to enjoy Geoffrey Milne's personal friendship, and thereby to gauge more fully his splendid mind, deplore his untimely death as a severe loss not only to East Africa but to Africa as a whole and to imperial and international science in which he had acquired a world reputation.

The loss is particularly painful to some of us older ones who had counted on their younger friend to carry on their own ideals regarding a sane development of Africa's precarious resources, based on knowledge rather than on wishful thinking; and to uphold—if necessary in fair fight, *sans peur et sans reproche*—the standard of real and lasting progress in the field of human well-being against the hosts of those who confound progress with scheming for their own immediate betterment: tasks for which his nobility of heart, his honesty and loyalty of mind, and his cheerful acceptance of the world around so fully fitted him. From those of us who also knew Geoffrey Milne as the charming and inspiring head of his lofty mountain home in its peaceful setting of forest and cloud, deep sympathy pours forth to the wife and the two young sons he has left behind.

C. G.

Dar es Salaam,

February 1942.

## African Village Layout

By G. Milne

[By courtesy of Mrs. Kathleen Milne we are able to give our readers a sample of Mr. Milne's lighter writings, which shows his charming style and the keen interest he took in his environment. The article was written in November 1940 in the form of a letter to Professor Fleure of Manchester, who intended publishing it in *Geography*, the Quarterly Journal of the Geographical Association, in slightly abbreviated form. War-time difficulties, Milne's leave in South Africa, and now his death having delayed publication in England, we believe that *Tanganyika Notes and Records* will be a suitable substitute for our more learned contemporary as a medium of publication.—EDITOR.]

THE LAYOUT of African villages would be a study taking one a long way into social habits and customs if gone into seriously. Often enough no true villages exist because the people have no motive for being gregarious; there may be no need for the craftsman or shopkeeper or parson or doctor or entertainer to live hard by the primary producers they serve, because, in so far as these functions are specialized at all, they are carried out part-time by folks who are most of the time primary producers themselves, and, like the rest, live most conveniently on the pieces of land they cultivate. Thus, where there is no threat from enemy or wild game of a nature to call for concentration or enclosure, habitations are scattered pretty uniformly through the cultivable lands—not, of course, as single houses, for a man may have several wives, a widowed mother, and a poor relation or two, all of whom live around the one compound, but these are hardly villages.

Thus, in west Usambara (the more populous part of these highlands that we live in) practically every little knoll and spur on the flanks of the valleys has a family cluster of two or three huts and a cattle-pen, and that is about all one can say about the village in those parts. All trade is done at the weekly markets held at centres a few miles apart on different days, where you *do* see humanity being gregarious, and very picturesque and fascinating these markets are. For the rest of the needs for which each family is not self-sufficient the footpaths from knoll to knoll and across the hill to the next valley are well worn, and there is much coming and going on such business; close proximity of residence is of no particular use to anybody and they do not have it.

However, to complete that picture one must add that there are several places on the rim of the west Usambara plateau where there are extremely compact collections of many houses, some scores or possibly two or three hundred, many built of long-lasting material such as sun-dried brick, which are really towns rather than villages. Such are Mtai at the extreme north-western end on a high promontory overlooking the Pare-Usambara gap, on the brow of the escarpment which is here over four thousand feet sheer, and Mlalo at the place where the Umba river drops from the plateau to the plain down its notch valley, which forms a staircase of access. It is clear that they

are, in origin, points of defensive concentration at times of raids by the Masai from the steppes below, and, no doubt, also bases for counter raids, for the Sambaa tribe in their hey-day, under their paramount chief of the Kilindi clan who was a magnate having dealings on terms of dignity with the Sultan of Zanzibar, were not people to meet aggression by appeasement. There are other similar compact townlets on other high spurs of the boundary escarpment of this region, for example near Lutindi and at Vugiri; they also are not true villages but frontier strongholds. Of course, west Usambara is a region with its own geographical peculiarity and a generalization from it is not possible, but a general picture has to be built up of examples as they are found, and the 'no villages, only family clusters' state of affairs would be found in many considerable and populous areas in East Africa. Two other examples occur to me immediately: One is Chagga, the southern slopes of Kilimanjaro; here the family clusters, with the cattle housed and fed indoors under the same roof as their owner, are uniformly distributed through the banana-groves and eleusine patches (and, nowadays, coffee gardens) over large continuous areas, and there is nothing remotely identifiable as a village. On the slopes of Meru fifty miles further west it is really the same, but the existence of open pastures diluting the banana-groves gives a slight emphasis to these latter as dwelling-grounds, though quite without structure as villages. In Bukoba (west coast of Lake Victoria) the last-named effect is much accentuated because the pasture lands are much more extensive, really grassy open country ringing the banana-groves around and isolating them at a good distance, but still each family compound is a unit and not specialized in any way as a dependent part of a bigger unit. The other example is Usukuma, the great cultivation-steppe lying between Mwanza and Shinyanga, though here the topography throws the family clusters more together, excluding them altogether from the *mbugas* (wide, shallow black-clay depressions) and concentrating them under the granite kopjes wherever these occur. I doubt whether any village structure could be distinguished here, as the unit is still the "farmsteading", but these units are often enclosed individually by hedges of *Euphorbia tirucalli* (manyara) and, being visible from a distance in that treeless country, dot the landscape in their groups, so that one tends to call them villages.

By contrast I think of the low-lying parts of Kavirondo, on the lake plain east of Kisumu. There one finds considerable numbers of houses enclosed within a tight hedge of manyara grown to taller height than in Usukuma, and only one entrance gate through it. Defence against lions and the marauding Nandi has determined this. Then the Wahehe of the Iringa-Mbeya plateau, and the Wabena of Njombe (southern Tanganyika) tend more to live in close groups with habitationless open country between; the houses have thick earthen roofs. There is a good deal of German literature on the Wahehe, especially as they figured largely in the Maji-Maji Rebellion of 1905-6, and a search in *Mitt. aus den deutschen Schutzgebieten* and other geographical journals might be worth while. As regards the Wabena of the lowlands (the Kilombero Plain, "Ubena of the Rivers"), Mr. and Mrs. Culwick in their book with

that title (Allen and Unwin, 1935) say that, since warfare ceased, the villages have tended to become much smaller, half-a-dozen houses only, and scattered all through the cultivated areas; also, that this presents a difficult problem to the Cultivation Protection section of the Game Department, because it is impossible to stop elephant, hippo and buck from taking their toll of grown produce when the population is so scattered, whereas with larger villages and the fields compactly disposed around them it would be possible to confine the game to the uninhabited bush. This suggests that the main motive for village-building was security rather than sociableness or social interdependence for other purposes; the tribelet in the next county having ceased to be an enemy, they have relaxed their former policy of concentration, but are finding that, with continuing abundance of wild game, this has been rather a mistake. They, therefore, quite naturally say it is all the fault of the Government.

The establishment of mission stations with their churches, schools, hospitals, clinics, etc., has, of course, led to concentrations of dwellings nearby. Indian shopkeepers settle there, mission-trained carpenters, tailors and other artisans set up in business, and you have something much more like the European village springing up, but, of course, rather formlessly. Similarly, a district administration headquarters becomes a small township, a railway station or cotton-buying post or ginnery becomes a centre of trade and lorry transport, scattered populations may be gathered up into a sleeping-sickness concentration for better medical administration and for beating back tsetse, and, in mining areas and districts where there are European-owned sisal or coffee plantations, there are large "villages" where the (mostly immigrant, detribalized) labour lives.

In the outlying districts of Uganda the village is fairly recognizable and unaltered from what it always has been, though it may show influences of the introduction of cash crops and spending-power, missionization and agricultural organization, etc. The grain storage bins form a very prominent feature in the drier parts of Uganda, very much more so than in more humid parts where some crops are harvestable at most times of the year. Then the nature of the staple starchy food affects this a lot. Maize is not storable in such structures, but is kept on the cob in its papery outer coverings, often in the smoky part of the roof within the hut, or hung up in large bundles in the branches of an *Albizzia* tree. Bananas are consumed directly off the tree or kept in small quantities as flour in earthenware pots, more rarely mixed with "magadi" (crude salt containing soda), as an iron ration for travelling; they do not affect village architecture,\* though brewed into beer they are an important element in village ceremony, etc. Mostly the large wicker bins hold eleusine (finger millet) which keeps for years if necessary; or various grain sorghums and pennisetums.

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\*Banana stem bast is the universal roofing material in banana-eating areas.

## The Mangati

By C. H. N. Jackson

IN SOUTHERN MBULU, where that district bulges down between Kondoa on the east and Singida on the west, the majestic volcanic pile of Hanang sweeps abruptly out of the Rift Valley to a height of eleven thousand feet above sea-level. Behind it to the north and west marches the Rift Wall, two thousand feet in height, rocky or thicketed, and splashed here and there with the dark green of evergreen forest descending in gullies from the top.

The mountain itself has twin peaks joined by a knife-edge, and is deeply scored by erosion channels. The southern face between the craggy peaks is a great breached crater which has blown away its earlier southern wall, and, like much of the rest of the mountain, is now clothed with evergreen forest. This imposing mass, visible on a clear day as far as Manyoni kopje on the Central Railway, is surrounded by small "parasitic craters", often containing very beautiful little lakes surrounded by yellow fever trees (*Acacia xanthophloea*), in which vultures build their nests.

In the Rift Valley itself lie two larger lakes or flats, Balangida Gidahan behind the mountain, and Balangida Lalu twenty miles to the south-west. "Balangida" in the Mangati language means salt, and the former of these two lakes furnishes in the dry season an abundant supply to the numerous caravans of neighbouring tribes.

Southward from the mountain to a distance of about fifteen miles, there is a magnificent sweep of mostly open grassland at an elevation of about five thousand feet, at first dipping away steadily from the mountain foot, then rising again to meet the extensive "miombo" (*Isoberlinia brachystegia*) woodland which bounds it on the south. This grassy saucer is broken here and there by the aforementioned parasitic craters, and supports a somewhat exiguous woody vegetation of *Acacia* and *Commiphora* trees, with bushes of *Grewia*.

The grass growth is usually not above knee height, and the dominant species, *Themeda triandra* and *Pennisetum massaicum*, provide excellent grazing.

These sweeping plains support great herds of hoofed game animals. Among the antelope we find roan, Coke's hartebeest, brindled wildebeest, eland, steenbok, impala and Thomson's and Grant's gazelles. Zebra and giraffe are also very common, and the heavier cover may hide buffalo and rhinoceros. This teeming fauna attracts considerable numbers of lions, which usually lie up in thicketed ravines by day; the sky is always flecked by several species of kites and vultures, and about the hunter's camp the night is made hideous by the idiot laughter of hyaenas—spotted and striped—and the falsetto bark of jackals. So numerous and rapacious are these scavengers that vultures may often swoop upon a dying beast before the hunter can approach, and on one

occasion when a roan was killed but could not be retrieved before nightfall a search in the following morning revealed no more than the black tail-tuft and a pile of undigested grass from the animal's stomach.

Birds are represented by many interesting and spectacular forms. Bateleur's eagle soars aloft, and there are many other eagles, hawks and harriers. Weavers breed in the small crater lakes, and the pied and white-crowned shrikes are common in the thorn. But the greatest variety and interest is provided by the waterbirds, especially on the flat Balangida Lalu and the very beautiful crater lake Basotu above the Rift Wall. In the rains the shallow waters of Balangida Lalu reflect the pink of vast flocks of flamingoes, and the sacred ibis abounds, the flocks stolidly marching into deeper water at man's approach. In the dry season there ascends from the firm yellowish mud of this grassless flat a thin white dust kicked up by herd upon herd of zebra, wildebeest and gazelles seeking safety on its open expanse, ten miles long by two or three miles in greatest width. More distant herds are elevated in mirage. Basotu, surrounded by fever trees, is famous for its untold flocks of duck, from spurwing to whistling teal, and its colonies of herons and egrets, as well as for its hippopotami. In February, it is amusing to watch the herons breaking twigs from the fever trees to build their nests. In the dry season the lake is a well-known watering place of innumerable guineafowl. Ostrich, secretary birds and greater and lesser bustard pace the drier plains, and francolins are common everywhere.

The woody vegetation is simple, usually dominated by Acacias. *A. spirocarpa* is prevalent in the west, both above and below the Rift Wall, with much *A. senegal*. The former may be recognized by its silvery thorns both hooked and straight, and flattened canopy; the latter by its thorns arranged in threes. The principal under-shrub is *Greusia similis*, with small bluish green leaves, toothed and asymmetrical, and with three veins from the base; it has mauve-coloured flowers in January.

In the east, *A. spirocarpa* is replaced by *A. usambarensis*, with stinking bark and rounded, bright green canopy; and large areas are covered with broad-leaved, low tree savannah of *Thespesia garckeana* with sinuate leaf margins.

The Rift Wall is mostly clothed with denser or lighter thicket of Crotons, Grewias, Albizzias, Acalyphas and the like.

The cracking clay soils of the plains and seasonal swamps support small gall-acacia trees of several species, *A. formicarum*, *A. drepanolobium*, *A. seyal*, and the more umbrageous *A. malacocephala* in the west above the Rift Wall. These trees produce, between the paired straight thorns, more or less spherical hollow galls, white in *A. seyal*, black in the other species, which are punctured by a small hole across which the wind blows with a whistling noise. The galls house ants which feed upon the exudates of the tree, and swarm upon any animal taking hold of it. Notwithstanding the supposedly protective function of the ants, the gall-acacias are a favourite food of the giraffe.

In places the red soil areas are clothed with denser bush, mainly of resin-barked spiny Commiphoras, and the low tree *Cassia singueana*, with little red pom-poms between each pair of rounded leaflets. Locally the bush is coloured by the large blue-green leaflets, arranged in threes, of the thorny-barked *Erythrina abyssinica*; and in the more open parts we may recognize at a mile or more its splendid flat-topped relative, the massive *Erythrina burttii* of the Masai steppe.

The climate of this colourful and majestic landscape is perhaps the pleasantest, surely the most exhilarating, of all Tanganyika.

The rainy season is well defined, with usually a long break about February, and lasts from late November or December to April or May. Except possibly near Hanang itself, the rainfall is usually between twenty and twenty-five inches annually. It is always pleasantly cool by day, often quite cold at night; for months at a time the temperature may not attain eighty degrees, and it never reaches ninety degrees. Grass minima may go down to freezing point about July.

In both the short dry season (February) and the long dry season (May to November) the country is swept by a steady south-east wind all day, which reaches a force of seven at the top of the Rift Wall, and the traveller therefore should not fail to protect his face and lips against wind and sun.

The people of this fascinating land, though backward, unruly, and unproductive from an administrative standpoint, are as interesting as the country they inhabit. They call themselves Barabaig, but are more familiarly known as Mangati. This, I am told, is a word derived from the Masai "Mangat", meaning the enemy, a worthy title to be bestowed by such a warlike people. Like the Masai, they are Hamitic speaking, and the language is said to have something in common with Somali; it lacks the articles characteristic of Masai.

The Mangati themselves are mostly tall and strikingly handsome people, with the long limbs and high cheek-bones of the Hamite, but I think rather more heavily built than the Masai. The men invariably carry a short-bladed spear with a heavy shaft of light brown *Grewia* wood, and a conspicuous, raised grey binding just behind the blade. They are also armed with a stout *Grewia* stick or club, whose use I am told is to knock leopards on the head, these animals being considered unworthy of the spear. Clothing is rather nominal, but a brownish cloak is usually slung over the shoulders, and on cold mornings is drawn over the head to form a hood. Ear ornaments are usually worn, nowadays purchased from an Indian *duka*, and necklaces are either obtained from the same source or strung locally from the dark blue-and-white seeds of a climbing plant. The hair is customarily shaved well back from the forehead.

The women wear skin dresses gusseted and moulded to the figure, and often very beautifully ornamented with beads. Impala skins, sometimes those of

Grant's gazelle, are greatly in demand for these frocks. Ear ornaments, bangles and necklaces are worn by them.

On gala days, the men may sport red cloaks and head-dresses of ostrich feathers or zebra mane, worn like an erect halo above the shaven forehead.

The bow and arrow is used, but the commonest weapon is the spear, which is thrown as a javelin and not used for stabbing. As soon as he can carry one, the young Mangati is provided with a spear of a size suitable for him, and with this he practises daily on a target, which is moved farther away as he becomes more proficient.

The eternal enemy is the lion, threatening the Mangati's herds, and this is killed usually by one man alone. The spear is thrown at close quarters and the lion transfixed; alternatively, there is no second weapon of defence—not so much as a knife—and there is therefore probably a fairly high rate of mortality among the young men.

As soon as a man has killed his lion, he takes the skin and visits the chief, who may detain him for a few days, and then gives him permission to sing his way around the country. This singing—or howling?—lasts for fifteen days, the singer agitating a shield before his mouth to make the voice waver and carry, and on still evenings the sound can be heard for miles. The young hero is accompanied by the girls of the villages on his route, who put cream on his head and assist with the singing. Every householder who hears his song must then contribute a head or so of cattle, usually young stock, and the singer goes on his way with an ever-increasing herd.

This is all very fine and admirable, but unfortunately the Mangati do not stop at killing lions. The traveller in the "miombo" woodlands to the south or east, or in the outlying thorn above the Rift Wall, may occasionally encounter a couple of young Mangati making their way into the country of some neighbouring tribe. As the Mangati almost never leave their own country for any other purpose, it may generally be assumed that they are out to kill man. On these excursions they usually carry a small supply of milk or meat, and choose a likely ambush by some road or track. Then when the lonely passer-by comes along—or it may be two together—the concealed watchers hurl their spears and spring out of hiding. If the throw has failed and the intended victim is armed, they take to their heels and run, and as they are great athletes pursuit is generally useless. If the spear has found its mark, certain tokens are cut from the body of the victim, and the slayer then makes for home. Men, women and children may be murdered in this way; occasionally a whole party of travellers may thus be butchered together. Large parties are usually not attacked, partly because potential witnesses may get away. However, the intending killer may not return alive, for if a lonely Sandawe tribesman sees a wandering Mangati in his country, he will not hesitate to put an arrow into him before the spearman can come near. It is said that, formerly at least, any one pretending to consult a book was not attacked, the Mangati standing in awe of literacy.

In earlier times, the returning murderer used to sing a song like the lion song; now this is regarded as dangerous, and he usually keeps very quiet. I was told, however, by some Wafiome living in the Mangati country, that if he does give tongue, the murderer is careful first to obtain a lion skin and damp it in water to make it seem new, in case inquiries should be made by the local headman.

Exactly why the Mangati kill man is not quite certain. Natives of the surrounding tribes will tell you that it is to blood their spears before they can marry. However, I am not clear whether, if so, a lion or a rhinoceros is accepted as equivalent to a man. I once asked a Mangati whom I knew rather well to explain the custom to me, but all he would say was that I should not listen to such improbable tales: "Who would want to kill his fellow man?" Rumour had it, however, that this particular fellow had as bad a local reputation as any of them.

The Mangati formerly, like the Masai, used to subsist on milk and on bleeding their cattle and drinking the blood. Now, however, most of them do at least a little cultivating, and blood-drinking is going out. A curious fact is that they do not use salt, though their country has, at Balangida Gidahan, such an excellent supply. I was told that salt is said to interfere with their running.

Cattle are not eaten unless some one is sick, when a beast is killed and ceremonially eaten by the visitors, not by the sick man. A possible variant of this may be exemplified by a Mangati who told a friend of mine that his cow was sick, and asked that some meat might be shot so that *he* might eat it and the cow recover!

The Mangati used not to eat antelope meat other than eland and possibly impala. Now they are not so particular, and hunt other game as well. One man whom we questioned at first agreed that only eland was acceptable. However, he presently amended this and said that nowadays he was like a hyaena and ate anything.

The Mangati are inordinately lazy, as they freely admit. They never carry anything, but use donkeys for all their luggage. One humorist described to me how this was done: "Yes, these are our motor cars. We put sticks up at the sides, cover in the top, push all our loads in at the back, shut it up and start away; then the motor car smells a lion, and off comes the whole bag of tricks!" If one shoots a beast in the Mangati country, it is essential to provide oneself with porters of some other tribe. Otherwise the Mangati, hearing the shot, are attracted to the carcass, and crouch round like vultures while it is being cut up. They wait hopefully until one's porters are loaded to capacity, then pounce on what is left and carry it off to their homes.

These homes are low *tembes* roofed with mud and arched on the top, and surrounded by a thorn fence to keep out lions. In spite of the modern habit of cultivation, the people are still half nomadic; they do not, therefore, spend

much labour on house-building, and their dwellings are inferior to those of the neighbouring tribes.

Like the Masai, the Mangati shake hands in the European manner, and when the European enters one of their compounds, men, women and children will probably greet him in this way. The women and children are not by any means shy, and a child of three or four will not stampede at the approach of strangers, but on the contrary will come to see who they are, and answer questions quite rationally like an adult. All the people are remarkably knowledgeable about the geography and natural history of the neighbourhood, and this knowledge is not confined to the men. Moreover, the inquiring traveller is not answered by those amiable, uncomprehending grunts which are so exasperating a characteristic of most other African tribesmen; the Mangati listen attentively when spoken to, and think before they answer, and my experience is that the information they supply is remarkably good.

Bathing is, I think, never practised, and swimming is literally unknown. The Mangati scrapes and sometimes oils himself, and leaves it at that. However, their scent is not really unpleasant, like that of some other tribes.

Greetings are complicated and lengthy. The answer to all of them is *ed'g*. The equivalent of the Swahili *hodi* is *bune*, and after saying this you can walk straight into the house if you know the people well. Otherwise you continue to stand outside and wait for them to come out; and if you do not know the inhabitants at all, then, it seems, it is better to take no chances and stand ten or fifteen yards away, while greetings are exchanged and the subsequent conversation proceeds! Common greetings are *waja*, *sayu*, *buneda gamazyu seni*, *hong'oli*, *numwichu*, etc., and the exchange and repetition of these, each answered by *ed'g*, may occupy several minutes.

The Mangati have little contact with the outer world, which in turn has left them very much alone. There are one or two Indian or Arab stores, but these either stay near the chief or close down except when cattle-markets are being held in the neighbourhood, and there are plenty of witnesses in case of any rough play. As far as I know, no mission has ever tackled the Mangati; there was a Government school for a short time at Khartesh, but it presently moved to Mbulu. They undoubtedly have some kind of religion, but I have not yet found out what this is; I was told that if you meet a Mangati in the bush, you must pull up grass by the roots and call upon the Mangati gods if you wish to save your life.

There are, of course, occasional prosecutions for murdering members of other tribes. But I think many, perhaps most, murders go undiscovered, and others again are paid for, by agreement, in cattle. Some years ago the King's African Rifles visited the Mangati and demonstrated the Government's power by bombarding tins with automatic weapons, but I do not know whether this display of force has reduced the murder rate in recent years.

The range of the Mangati was formerly much wider than it is to-day. Their cattle used to graze across the Bubu river to the east and in the hills

where the Great North Road now runs. In the south their former boundary was approximately the (now defunct) Kondoa-Singida Road, and on the west they ranged to the borders of the Iambi country in Mkalama. All these outlying regions are bushed, with "miombo" woodland, thicket or thorn, and within the present century they have become invaded by tsetse-fly, forcing the pastoral Mangati to withdraw and finally to bunch themselves together about the foot of Hanang. However, they are very much alive to the tsetse menace, and have an excellent idea of just where it is safe to graze their herds. They have even exerted themselves so far as to clear some bush to keep back the flies.

The future of this people cannot be predicted, but threatened as they are by the forces of civilization on the one hand and of nature on the other, it is scarcely to be supposed that they will long retain their present distinctive but vanishing character, for which there may be permitted a pagan and reactionary sigh.

There is about the country a savage nobility which cannot escape the visitor. The pale light of the high altitudes, the crisp air, the wide sweeps of plain, thorn and grassland, with its splendid population of wild game; the white granite rocks and pinnacles above the western Rift Wall; the lovely lake Basotu and the fantastic Balangida Lalu; the Rift Wall above Balangida Gidahan, recalling the headlands of the Northern Irish coast; the high Bereku ridge in silhouette to the east, culminating in Ufiome mountain at its northern end, and, beyond that, the distant glimpse of the Masai steppe; the wild and broken no-man's-land of the thicketed woodlands to the south, home of the elephant and the kudu; and above all the imposing giant mountain with its twin peaks, surveying and presiding over the whole wild upland scene: in the dry season there is a chilly grandeur in this country that cannot leave the traveller unmoved. And the fierce and handsome Mangati, drawing ever closer about the foot of their mountain, relinquishing little by little their barbaric usages, conforming more and more to the commonplace customs of their neighbours, intermarrying with these, as they are, to an ever greater degree, have not been inappropriate inhabitants of this majestic land, with its brooding air of sad impermanence.

Even of the mountain itself, the geographer Obst, regarding the mighty wounds struck by the coursing waters, was moved to exclaim: "The days of Hanang are numbered; and when grey cumulus heaps envelop its summit, surging sombrely hither and thither, the whole becomes an endless melancholy lament for the inevitable destruction. Here Hanang was born one day, a stranger in the land of plateaux and steps; now he withers, a victim of nature eagerly obliterating all unevenness."\*

There are now roads running both north and south of Hanang. But the proper approach is on foot with porters from Kondoa, crossing the Bubu river

\*NOTE.—Obst was wrong; for more recent exploration has shown that Hanang, at least its lower part, was there *before* rifting took place.

near Selya and thence by Mangaloma to Mzee Seja's (Suwa), the last village before the plains. Plenty of food for the carriers must be taken, for none can be purchased on the journey. After Selya the safari enters the wilderness of "miombo", thicket and thorn, walking in the tracks of the elephant and rhinoceros, buffalo and giraffe. Westward rises the mighty dome of thicketed Swagaswaga, noted for its pygmy antelope and lesser kudu; north is a confused jumble of granite hills, crowned with piles of white rocks. Glimpses of the mountain are obtained from time to time, while the safari passes through the gloomy silence of the "miombo" woods, the trees ripped and torn by wandering elephant herds. Detours to right or left may often bring the traveller into glades or valleys where no white man has been, for no one goes there now, and even up to 1912 this wilderness was described by the German explorers as "still quite unknown: thick bush". From time to time the safari crosses a more open stretch of seasonal swamp, where zebra and hartebeest scamper away at its approach; or a party of roan gallops off among the "miombo" trees, or the steam-engine snort of a rhinoceros in the thickets causes loads to be dropped and shoes to be shuffled off by the apprehensive carriers, in readiness for climbing trees.

The pace quickens. Abruptly the woodland ceases, and the safari emerges on the open plain. A herd of hartebeest gets up from the grass on the right; zebra and eland file down the slope ahead; giraffe stand farther off among the gall-acacias; there is a herd of wildebeest, there more hartebeest, there and there gazelles. The eye looks on to take in the overwhelming panorama. The mountain, fifteen miles away, now fills the sky; behind it the incomparable sweep of the Rift Wall, before it the lesser crater hills. To the right are Ufiome and the Bereku ridge, rising to Salanga with its mane of evergreen forest and the lone Podocarpus tree.

Camp is pitched, and the mountain, magnificent by day, by moonlight is sublime, shimmering in the clear air.

That is the way the country should be approached, and no pilgrim can be disappointed. Here is the quintessence of the old Africa, which we in our time are still so fortunate to see.

## A Short History of the Tanganyika Railways

*By C. Gillman*

### INTRODUCTION

**R**ARELY, in this twentieth century of rapid change, can it have been the fate, the privilege, of an individual Civil Engineer to devote practically his whole working life to one and the same enterprise; to follow, almost from its beginnings, the "opening up" of a new and important slice of Africa as an active participant in the surveys, construction and administration of its railways; and to watch under constantly and often rapidly changing internal and external conditions the hopes and successes, the follies and failures inseparable from the fascinating task of linking "New Lands" to the old established nuclei of a pushing and powerful civilization. It may, therefore, not only be pardonable but even of some interest to many concerned in one way or another with the advancement of Tanganyika Territory, if at the conclusion of my thirty-two and a half years' connection, in various capacities,\* with what we now call THE TANGANYIKA RAILWAYS, I attempt this historical essay. In doing so I propose to fuse facts and data culled from a large number of official and unofficial publications, from musty old files and memoranda, with a vast store of personal reminiscences, and thereby try to render the dryness of the former more palatable to the general reader by an admixture of the juices—not necessarily always sweet juices†—of my own experience. I must, however, warn my readers that this is my first excursion into historical writing and crave, from the start, their forgiveness of many inevitable shortcomings in exposition and elaboration.

The numbers appearing in brackets throughout the article indicate references, a list of which is furnished at the end of the text.

### PART I

#### FROM THE EARLY BEGINNINGS TO THE GREAT WAR (1887–1916)

##### (1) PRELIMINARIES

The earliest history of railways in the German East African Protectorate which, as is well known, was originally administered by a chartered company (the Deutsch Ost Afrikanische Gesellschaft, commonly referred to as the "Usagara"), is one of hesitations, of theoretical arguing on the advantages and disadvantages of colonial railways, of the clash of diverging interests each

\*I joined the staff of the contractors for the Central Railway in 1905 as a young Assistant Engineer; in 1914 the outbreak of war found me in charge of a railway survey to penetrate into Ruanda. In 1916, after two years of involuntary stagnation as a civilian prisoner of war, I was commissioned with the Railway Corps of the East African Protectorate Force, and in 1919 was taken over by our civil railway administration in which I served as District Engineer first, and from 1928 as Chief Engineer, with a year of Acting General Manager in 1935–36, and retired at the end of 1937.

†The Editor thought it wiser to dilute some of these juices.

of which had its own pet scheme to boost. It was only after the Uganda Railway had reached Lake Victoria in 1902, with the result that practically the whole trade from and to the German part of the lake basin was being rapidly diverted via Mombasa, that the period of feuds and theoretical quibblings gave place to one of more unified and energetic desire to secure for the German ports on the Indian not only the trade of their vast hinterland, by countering as quickly as possible competitive inroads from the Nile, Congo and Zambezi but, by active competition on their own part, to attract the traffic from the Central African lakes basins and the eastern Congo to these ports. Contrary to what has been said in the past by several would-be observers it was, thus, not the German idea to build strategical railways: the primary stimulus was, no doubt, "peaceful penetration" through competitive development and capture of traffic; although, of course, the general administrative benefits and the strategical advantages for quelling native risings, of an efficient railway system, were included in the deliberations. The concept of a powerful military "Mittel Afrika" was evolved only much later and if, indeed, it ever played a dominant role in earlier railway policy the fact must have been well hidden in some secret and inaccessible files!

From the northern port of Tanga a little pioneer line of metre gauge, started by private capital early in the nineties, was painfully and slowly and with many interruptions pushing its way inland, in the vague hope that, one day, it would reach the south-eastern shores of Lake Victoria. A similar pioneer line, destined to open up the immediate hinterland of Dar es Salaam as far as Morogoro, was at long last being financed early in the century. This it was hoped to extend later as a trunk line to Lake Tanganyika. A third project, contemplated from the beginning as a trunk line, because there was no promising coastal hinterland for it, was to link the port of Kilwa with Lake Nyasa. In the light of present-day more intimate knowledge of the Protectorate's resources, this whole preposterously grand scheme of planning three long main lines—the northern of which paralleling an already existing railway at no great distance and destined to serve the same inland areas—was based on two fundamental misconceptions, children of that dangerous liaison between the fancies of wishful thinking and the optimistic closing of eyes to the stern facts of geography. The first of these misconceptions was the pitifully exaggerated notion of the fertility of tropical soils, of teeming millions of population, of unbounded dormant wealth, both agricultural and mineral; and the second the lure of the Central African lakes with their one thousand eight hundred kilometres of waterways that would immediately and at negligible expense greatly increase the effective radius of railway mileage; the argument being quite erroneously fortified by reference to the great North American lakes, with which ours have only the one thing in common, physically and economically, that they consist of water!

It is not only instructive, but highly amusing, to study the accounts of the early explorers, the reports of the administrators who followed in their foot-

steps; the memoranda and speeches of parliamentarians, company promoters, planters and would-be farmers; all bent to further their own temporary, real or imaginary, interests by describing in glowing language features that did not exist, or by turning half-truths into pictures of enticing beauty through a generous application of the painter's brush. For those who have neither time nor opportunity for such burrowing into the literary treasures of the past, the writings of a few propagandists have made it easy to obtain a general grasp of this trend of mind.

Thus we have a pamphlet of 1903, by Dr. H. Hesse, which brings together and digests a great number of optimistic "observations", carefully omitting anything of a more pessimistic nature that may have been said or published. And in 1907, two railway experts, Dr. O. Blum and E. Giese, wrote a treatise on how to open up the German colonies in which great emphasis is laid on the importance of the Central African lakes. There were, of course, more sober minds who realized the natural shortcomings of much of East Africa and raised warning voices: for example, among the very earliest that penetrating and courageous young exponent of the truth, Joseph Thomson, regarding the "bleak highlands" of Uhehe; and the geographer, H. Meyer, who, in his first book on Kilimanjaro, in 1891, thought that much of East Central Africa "breathes the air of the churchyard" (from the developmental point of view), and in a later publication ("Der Kilimanjaro", 1900) doubts the economic possibilities of a central railway to such an extent that he calls the project a "utopian enterprise". Gradually, however, the over-optimists and over-pessimists met half way: the indirect advantages of a trunk line for the development of the Protectorate, including its influence on internal trade, were realized and railway policy and finance based on the sound principle that not the estimated railway revenue and expenditure as such, and alone, but the country's total financial power—justifiably expected to increase *pari passu* with the increase of railway mileage—must determine where, and at what rate of progress to build.

As a result of such considerations, and under the stimulus of guarantees by the Reich to the "Fiskus" of a proper colonial administration that had replaced chartered company rule, the immediate policy evolved during the first decade of the century was: (1) to extend the Tanga Railway to the foot of Kilimanjaro and Meru; (2) to push the Central Railway with all speed to Lake Tanganyika; and (3) to drop, at least for the time being, the scheme of a Southern Railway. Thus, for a considerable period the history of the German East African Railways coincides with that of the construction and development of the Tanga and Central lines with which I now propose to deal at length, having been at considerable pains to search for, and to save from oblivion, the facts regarding their pre-natal life, their birth pangs, and their staggering childhood. To do so I have found it more convenient to deal with each line separately, thereby splitting a concurrent chronology into two individual streams.

## (2) THE TANGA OR NORTHERN LINE

On the strength of a memorandum by the Deutsch Ost Afrikanische Gesellschaft, dated the 25th June 1891, which deals with the project of an Usambara Bahn and with its future extension via Tabora to Lake Tanganyika with a branch to Lake Victoria [21, page 2], the German Imperial Government and the Deutsch Ost Afrikanische Gesellschaft concluded an agreement on the 3rd August 1891 according to which the company was to form a daughter company for the purpose of constructing and operating railways and ports in German East Africa, in the first instance a metre-gauge line from Tanga to Korogwe. This company, accordingly, came into being under the name of "Eisenbahn Gesellschaft fuer D.O.A. (Usambara Linie)" with an initial capital of two million marks [1, 1891, page 354].

On the 22nd November of the same year the concession for the construction and operating of the Tanga-Korogwe railway was signed by Chancellor Caprivi [1, 1891, page 531], stipulating that the line should be opened for public traffic at least as far as Muheza within four years, and as far as Korogwe within twenty years! A clause clearly revealing the doubts in the minds of the contracting parties regarding the success of the venture; and in his despatch of the 20th September 1891 Governor von Soden, more outspoken, predicted the company's bankruptcy "in the shortest time", unless backed by imperial finance.

However, the first engineers arrived at Tanga in August 1891 but their instruments having been overcarried—a sinister omen—could not start their survey work before the end of October. Actual construction only commenced in June 1893 and, after a primitive pier had been built for handling railway material, the connection between port and railway station was completed in May 1894. In the meantime the company's first annual report, covering the years 1891-92 had appeared. It accepts the revised estimate of approximately one and a half million marks for the section from Tanga to Muheza and refers to a report by the geographer, Dr. Baumann, that extensions to Lake Victoria and Tabora would not meet with any unsurmountable difficulties [1, 1893, page 561]. The history of the early years of construction does not make very encouraging reading: bad workmanship in the original landing pier; inexperienced personnel; the location method of survey which failed to find the best alignment because it shirked width of reconnaissance; difficulties in procuring sufficient labour locally which resulted in drawing on Mozambique for imported labour; the realization that cheap timber sleepers from the much praised local forests were not forthcoming and that steel sleepers had to be resorted to; the under-estimating of the topographical and climatic handicaps: all these contributed to unexpected setbacks and delays, so that railhead did not reach Muheza, only forty kilometres from the coast, until the end of 1895, an average annual progress of sixteen kilometres. In the following April this first section was handed over to public traffic although not more than one-half of the line was properly ballasted; and a Public Traffic Order ("Bahnordnung")

was issued by the Governor in November 1895 [1, 1894, page 607; 1895, page 577; 1896, page 187].

In addition to these environmental and technical difficulties, more serious ones of a financial nature made themselves felt, as had been anticipated by the Governor. Nearly three-quarters of the company's capital having been spent on the as yet not completely finished lower half of the line—an achievement which the report for 1895 refers to as “our creation universally recognized and fully appreciated in the colony as the first great cultural deed” [1, 1896, page 711]—the confession, in the same report, became inevitable that construction had to stop; and this in spite of further advances made by the parent company, the *Deutsch Ost Afrikanische Gesellschaft*. Traffic could only be maintained during the following years with the aid of substantial subventions granted by the Imperial Government, the Tanga pier had collapsed, many culverts were broken, the few locomotives were in very bad repair, and M 300,000 were required for a general overhaul. At the end of 1897 Governor von Liebert complained “bitterly” about the state of affairs and advocated extension to Mombo by the Reich, the cost of conversion from metre to sixty centimetre gauge having been investigated. An engineering report, early in 1898, suggested closing down of traffic [21] although the latter had somewhat increased of late: two weekly trains were running, and revenue amounted to Rs5,400 in September 1898 [1, 1898, pages 648 and 742]. No wonder, therefore, that at long last the Imperial Government saw fit to cancel the concession given in 1891 and, by agreement with the company and the *Deutsch Ost Afrikanische Gesellschaft*, dated the 7th April 1899, to take over the existing railway with all its accessories for M 1,300,000, a good bargain for the Reich but a poor reward for the company's sacrifices in the interest of railway development! At the same time M 300,000 for repairs, M 116,000 for running expenses in 1899, and a first instalment of M 250,000 for the extension to Korogwe were made available; and in March 1900 the re-estimated amount of M 2,300,000, necessary to reach Korogwe, was sanctioned by the Reichstag [21]. After a stoppage of more than three years, construction was resumed at Muheza in July 1899 [21 & 1, 1899, page 806] with the aid of small contractors whose mutual competition was considered advantageous to progress.

In the beginning this seems, indeed, to have been a little more satisfactory, but labour shortage at the end of 1900 and a severe rainy season early in 1901 delayed the opening of the section to Korogwe until the 15th March 1902 so that the average construction rate again did not exceed sixteen kilometres in a year. In the meantime the survey onwards to Mombo had been started and in September 1903 an agreement was signed between the Fiskus and Lenz and Company, a reputable firm of railway contractors at Berlin, for the construction of this section at a cost of M 2,600,000. Thus, after a stop of twenty months at Korogwe, work was resumed once more on the 1st November 1903. The first large bridge of the line, over the Pangani River, was completed in August 1904, and the line opened for traffic to Mombo on the 24th February

1905, Prince Adalbert of Prussia performing the ceremony. Thus, at long last, a comparatively good annual progress of thirty-six kilometres had been made. But the idea of an eventual continuation of this ill-fated line to Lake Victoria seems to have been dropped for the time being, and to judge from the experience gained thus far, with a mere one hundred and twenty-nine kilometres having taken fully twelve years to build, the dropping of an ill-conceived, though at times much cherished scheme was, no doubt, wise [1, 1904, pages 120, 156; 21].

A great step forward in the right direction was taken early in 1905 by the founding, in Berlin, of the "Deutsche Kolonial Eisenbahn Bau- und Betriebs Gesellschaft" (company for building and running colonial railways) with an initial capital of M 4,000,000 [1, 1905, page 143], essentially the firm Lenz and Company. This company took over in April 1905 the operating of the Tanga railway against payment to the Fiskus of an annual rent fixed at M 152,000 in 1908, after net profits, replacing the former subsidies, had risen to M 132,000 in 1907. These satisfactory results led to a further short push forward, the forty-five kilometres of line from Mombo to Buiko being started in 1907 and opened on the 27th July 1909. This section had cost M 4,200,000, and early in 1910 the annual rent was raised to M 246,000 [1, 1911, page 838].

An expedition under the personal guidance of the Under-Secretary of State, von Lindequist, having explored the possibilities of settlement in the northern highlands of the Protectorate in 1908 and having reported very favourably, the Reichstag granted M 12,250,000 for the extension of the railway to Moshi, at the foot of Kilimanjaro, and M 1,500,000 for harbour improvements at Tanga.\* For the first time a proper construction contract was drawn up between the Fiskus and the lessee of the line, after the pattern of the contracts by which the Central railway was then being built, the annual rent, after reaching Moshi, being raised to M 760,000, an astonishingly high figure. Progress over this section of one hundred and seventy-eight kilometres was at the rate of eighty-four kilometres per annum, the line being opened to traffic on the 4th October 1911 and inaugurated with great pomp and a large consumption of wine on the 7th February 1912 [1, 1911, page 838]. At about this time the name of the line was changed from "Usambara Bahn" to "Ost Afrikanische Nordbahn". The standard of construction as well as of alignment of this inland half is very much higher than on the coastal sections and fully reflects the soundness of employing financially powerful concerns and qualified personnel for such work. To a certain extent the worst shortcomings of the original pioneer line were overcome by reconstruction between 1912 and 1914, the necessary funds—M 1,800,000—being found from savings made on the

\*It was a surprising sight to see, in 1913, the Tanga shore littered with thousands of tons of reinforced concrete piles, anchors, etc., the parts of a complicated design for a new quay wall, which had all been cast at Mannheim on the Rhine! Fancy carrying all these tons, largely consisting of sand, by river barges to Rotterdam and thence seven thousand miles overseas, instead of using local sand. The wall, incidentally, partly collapsed soon after completion.

Buiko-Moshi section [14]. Among others, the impossible double switchback at Ngomeni station, which had been such a severe handicap to traffic, was eliminated: quite an easy task, really, for now when plantations had taken the place of the virgin forest, the topography had become immediately clear whereas formerly it could only have been grasped by more perseverance than the original "location" engineers seem to have possessed. What remains dark, however,—years of careful investigation on my part have not revealed the official reason—is why, with the throwing open to settlement of the Pare mountains as one of the main aims, the line was taken along the western desert foot of these highlands instead of following the climatically much more promising eastern foot from which, incidentally, access to the higher reaches by roads is much easier than over the precipitous western cliffs. Was the reason, perhaps, to use the mountains as a defensive barrier in case of war, with the British boundary running not far from their eastern foot? In any case a parallel road, essential to serve eastern Pare, was built and forms to-day part of the Tanga-Moshi main road, in fact its best part!

A number of further feeders had come into existence: in East Usambara a timber concession—the Zigi Export Gesellschaft—had started to join its sawmills to the railway by a seventy-five centimetre gauge tram-line, which eventually extended for twenty-four kilometres over very rough ground, and also served for many years as the main approach to the East African Agricultural Research Station at Amani [1, 1904, page 760]; from 1911 traffic over this branch was run by the lessees of the main line [12, 1912, page 6]. In 1914 the German Government contemplated its purchase, the negotiations being interrupted by the outbreak of war.

A road of sorts, for animal-drawn wheeled traffic, led from Korogwe high into Central Usambara to the sanatorium at Vugiri. A very excellently surveyed and engineered metalled mountain road, thirty-one kilometres long, built in 1909-10 at the remarkably low figure of £700 per kilometre, and the first to be designed for motor traffic, joins large plantation districts in Central and Western Usambara to the railway at Mombo. Mkumbara is the terminus of a nine-kilometre long ropeway which scales the forbidding cliffs and gorges of north-western Usambara, with a maximum span of nine hundred and seven metres, the longest in existence at the time of its construction in 1910-11. The private property of the firm Wilkins and Wiese, this somewhat daring enterprise was designed to exploit the "cedar" (*Juniperus*) forests of the Shume plateau, a scheme that has never fulfilled the optimistic hopes of its originators and of others who followed in their footsteps after the war.

By the end of 1912 the location survey for an extension from Moshi to Arusha was completed and funds for this addition and for further improvements of the main line and Tanga port, amounting to M 9,400,000, were approved by the Reichstag for 1914 and 1915 [23], and contracts for construction had already been let when war broke out.

A scrutiny of the *financial* aspect of the Tanga line shows that approximately M 25,000,000 (£1,125,000) had been spent on Tanga port and the line to Moshi, most of the capital having been provided through a four-per-cent loan, so that the annual interest commitments were in the neighbourhood of M 1,000,000. Revenue, exclusive of that derived from the transport of construction material—in any case an ephemeral source which cannot legitimately be included in a financial analysis—had steadily risen with the increasing length of the line from M 186,000 in 1905 (length one hundred and twenty-nine kilometres to Mombo) to nearly M 1,200,000 in 1912 (length three hundred and fifty-two kilometres to Moshi). During the same period running costs had increased from M 132,000 to M 883,000, giving for 1912-13 the not very favourable ratio of expenditure to revenue of seventy-four per cent. For this, no doubt, the low standard of the coastal section was primarily to blame, so that the hope of reducing the ratio to somewhere near sixty per cent, once the necessary improvements on the bottom sections were made, seems to have been a reasonable one. Even so, however, it is quite out of the question that in 1913 and the following years the surplus of revenue over expenditure, which in 1912 was only M 331,000, could have been anywhere near the stipulated rent to be paid by the exploiting company from that year onwards, namely M 760,000 annually, a sum itself well below the total interest charges of M 1,000,000. The optimism expressed in the company's last published annual report and in the memorandum covering the estimates for the Arusha extension was, therefore, hardly permissible on the strength of railway finance alone, and could only be upheld if the indirect benefits to the country derived from the railway were taken into account. In this connection there can be little doubt that it had proved a great stimulant to a rapid expansion of plantation enterprise, both in the low coastal hinterland and on the Usambara highlands, and if in parts the choice of crops—as for example rubber and coffee—proved unfortunate this was not the railway's fault!

However, the war made an end to all such economic speculations and when, in 1916, General Smuts's main invading force fought its way down the line the retreating Germans not only destroyed every major bridge and many large culverts, but actually removed many kilometres of track between Kahe and Lembeni, using the material to fortify their trenches above the latter station; indeed, a sad relic of their first proud achievement in railway development that they left in our hands!

### (3) THE CENTRAL LINE ("MITTELLAND BAHN")

As soon as the Chartered Company had commenced its activities in East Africa, early in 1887, a surveyor (von Haecke) was engaged for a reconnaissance of a railway from Dar es Salaam into the interior, his work being rudely interrupted by the serious Arab rising later in the same year. After this had been quelled in 1889, a line to join Dar es Salaam and Bagamoyo and intended later to run up the valley of the Ruvu River, was surveyed in 1891 under the

auspices of a South German banking combine. These were the first steps in the direction of East African railway enterprise, but "as they produced no useful material they must be considered as unsuccessful attempts" [1, 1891, page 338; 2, page V]. The earliest and enthusiastic champion of a Central railway was, no doubt, Wilhelm Oechelhaeuser, a member of the Board of Directors of the Deutsch Ost Afrikanische Gesellschaft. In 1891 he called a conference of well-known African explorers who voted decidedly for a railway from Dar es Salaam to Lakes Victoria and Tanganyika, and also for a line from Tanga to Kilimanjaro, of "lesser importance but probably easier to realize at the time". His stubborn and well reasoned fight against the advocates of this northern line and of a southern one to Lake Nyasa, makes excellent reading but an account of it must, for lack of space, be excluded from this short history.

Things took more definite shape when, in March 1895, representatives of the Colonial Department of the German Foreign Office, of the Deutsch Ost Afrikanische Gesellschaft, and of the Deutsche Bank formed a committee to deal with the preliminary investigations for the construction of a Central railway to join the coast to Lakes Tanganyika and Victoria [1, 1895, pages 153-5]. After painstaking deliberations which produced some rather acrimonious memoranda from the representatives of the warring parties, a report was submitted to the Chancellor in June 1896 [2] which strongly advised as follows: To commence without delay the construction of a seventy-five centimetre gauge railway, jointly from Dar es Salaam and Bagamoyo, to Ukami (Morogoro), as a first instalment of a central line to Lakes Tanganyika and Victoria; and to entrust this enterprise to a reliable private firm with the promise of assistance and subsidies by the Reich sufficiently attractive to draw German high finance ever more closely into the service of colonial aims. The report emphasized, in the typical spirit of early enthusiastic optimism—still breaking out from time to time even in our own, more enlightened days—that the country to be traversed by such a line offered "all foundations for marvellous ('grossartig', [*sic*!]) economic development". The committee's work had been greatly helped by detailed surveys conducted in 1904 and 1906 by a sapper officer (von Schlobach), who determined the best crossing of the Ruvu at the Mafisi ferry (to-day's road crossing), studied alternative lines thence to Kisaki and Morogoro, as well as the possibilities of navigation on the lower Ruvu [1, 1895, pages 375 and 431]. In his reports mention is made of a "Mackinnon Road", built "at great expense by the English" from Dar es Salaam into the Pugu hills. I have been unable to trace the origin of this road.\* Simultaneously a reconnaissance of the second section, from Morogoro to Tabora, was set on foot but no records of the results seem to be extant.

Negotiations in Berlin seem to have proceeded smoothly and in September 1896 the formation by the banks concerned of a railway company was about

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\*Perhaps some reader can help?

to become a fact when, as so often, a personal event frustrated all efforts: Dr. Kayser, the Director of the Colonial Department, who had been greatly in favour of the scheme, retired suddenly. Under his successor the Usambara line "party" regained preponderance, and the Central railway project was dropped under the pressure of having to rehabilitate the more than shaky finances of the northern railway, a task fully occupying the department until 1899 [2, pages 109-10]. This stumbling block having thus been removed, the Central railway scheme once more raised its head, the Kolonial Rath (Colonial Council) agreeing in October 1899 that the line should be built and as large a sum as possible for its survey inserted into the budget for 1900 [1, 1899, page 730]. This resolution was confirmed in November 1901, when the Council plumped for "a railway policy fully conscious of its aim to counter competition of neighbouring colonies", and pressed again for early legislation.

In 1903 a further survey expedition, financed by a syndicate headed by the Deutsche Bank, studied yet once more the alignment between Dar es Salaam and Morogoro [1, 1905, page 296]; and early in 1904 the Kolonialwirtschaftliche Komite—a private group representing colonial commercial, industrial and agricultural interests—memorialized the Reichstag regarding the importance of the line for increased cotton production [1, 1904, page 174]. At long last construction was approved by the legislature: on the 29th June 1904 the Ost Afrikanische Eisenbahn Gesellschaft was founded in Berlin with a capital of M 21,000,000, and on the following day it received corporative rights from the Imperial Government together with its concession to construct and operate a metre gauge railway from Dar es Salaam to Morogoro. The Reich guaranteed three per cent interest: and the concession entitled the company to choose from a zone a hundred kilometres wide on either side of the line, twenty square kilometres of land for each kilometre of the railway, free of charge: and also to eleven hundred and fifty square kilometres, in not more than three blocks, within the same two-hundred-kilometre zone, for exclusive prospecting and mining purposes. To administer these lands, the company founded a daughter concern, the Ost Afrikanische Land Gesellschaft. It also participated, until 1912, in a hotel company which hoped to make African tourism fashionable by a string of large and well appointed hotels at Dar es Salaam, Tabora and Kigoma. From 1907 the railway company also provided the capital with electric light and power, the plant being run in conjunction with the railway workshops: and by an agreement with the Fiskus of 1st April 1913, it was entrusted with operating the Dar es Salaam dockyard, the fleet of coastal steamers (the so-called "Flotille"), and the marine services on Lakes Tanganyika and Nyasa [16]. In 1908 a Railway Commissioner, later called "Eisenbahn Referent", was appointed as a new government department with whom rested the general supervision of the Territory's railway activities; and in June 1914 the newly constituted "Eisenbahnrat" (Railway Advisory Council) held its first session [25].

The contract for the line was given to Phillip Holzmann and Company, of Frankfurt-am-Main, an important firm of international standing which had just completed the first part of the Baghdad railway through Asia Minor and was thus in a position to transfer its organization of well-trained staff and experienced sub-contractors without delay to East Africa. The first sod was turned on the 9th February 1905, one of the Hohenzollern Princes happening, as usual, to be obligingly present for the occasion. During the first rainy season unforeseen difficulties were encountered in the coastal ranges, largely due to the treacherous nature of the marly sandstones and clays composing these hills, and to having to cross the wide flood plain of the Ruvu River which required a large number of girder bridges on deep foundations. In addition, the outbreak of the Maji-Maji rebellion created a temporary labour shortage which, at one time, it was sought to overcome by importing indentured Chinese coolies but which, fortunately, was soon much more efficiently countered by recruiting among the country's own inland tribes, notably the Wanyamwezi. It is to these latter's cheerful sturdiness under the influence of good wages and an ample ration of Bombay rice that the smooth progress, not only of this coastal section but of the whole long trunk-line, eventually owed so much. The mean annual progress over the first eighty kilometres to Ruvu, of thirty-two kilometres, though nothing to boast of, compares very favourably with that over the same length of the Tanga line—only twelve kilometres per annum exclusive of a long stoppage; and thence onwards attained such speed that Morogoro station was opened for public traffic on the 16th December 1907, six and a half months ahead of contract time, making the mean progress over the whole two hundred kilometres sixty-seven kilometres per annum.

In the meantime the Kaiser had entered upon an experiment: for the first time in Prussian administration, the post of a Secretary of State was entrusted to a non-official. Dernburg, a well-known banker and economist, took charge of the Colonial Office and set out to see for himself the problems of East Africa, accompanied by a few of the outstanding younger representatives of German finance and industry. Having travelled up the Uganda railway to Lake Victoria, he emerged from his long safari at Morogoro just as the first locomotive rolled in, and at a banquet to celebrate the occasion, with the lions roaring and the hyaenas howling round the primitive little pioneer hotel, in October 1907, he announced for the first time his far-reaching plans according to which the short coastal feeder, just completed, was to be turned definitely into the coastal section of an overland trunk-line. These plans received the approval of the Reichstag on the 18th May 1908 and on the 12th July an agreement was signed by the East African Fiskus and the Railway Company whereby the latter, retaining all its concessional rights, received M 80,000,000, the estimated cost of extension from Morogoro to Tabora, as a loan from the Fiskus, the Reich guaranteeing interest at four per cent. As a security, the

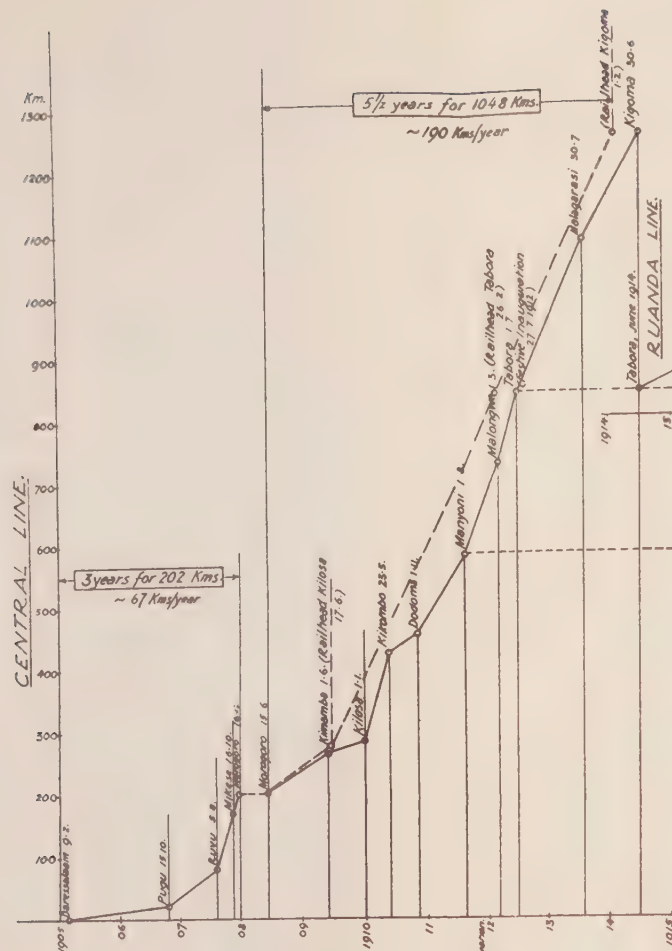
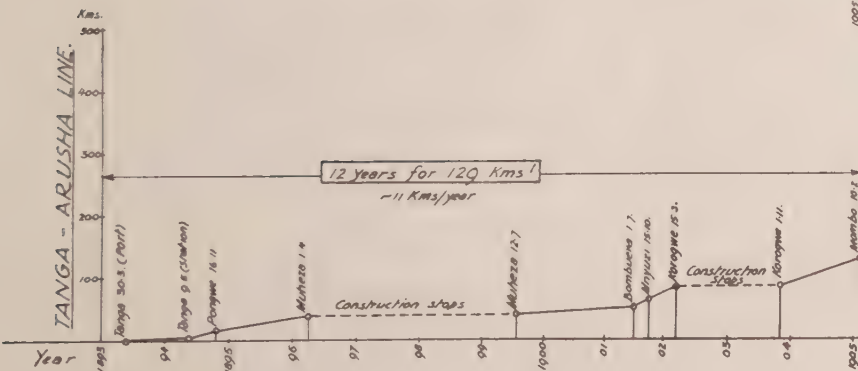


# TANGANYIKA RAILWAYS.

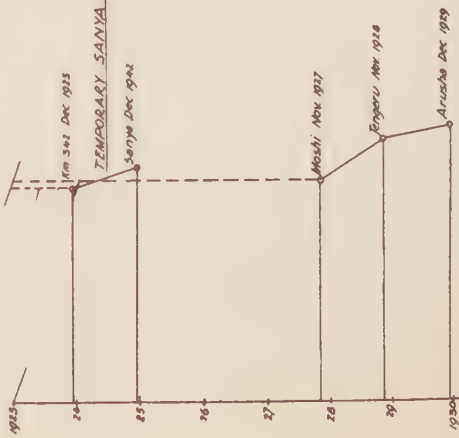
## PROGRESS OF CONSTRUCTION.

1893-1934.

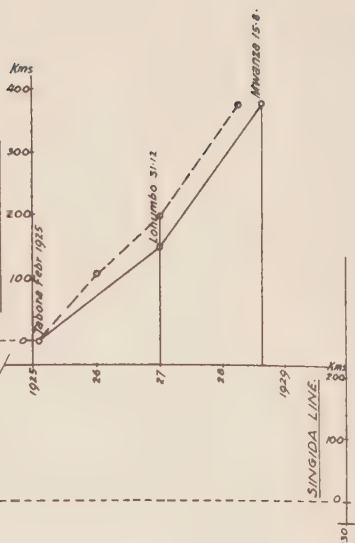
THE DATES SHOWN INDICATE OPENING FOR PUBLIC TRAFFIC.



### TEMPORARY SANYA BRANCH.



### MIWANZA LINE.



### SINGIDA LINE.



Dar es Salaam-Morogoro section and, on completion, the several sections of the new line, were mortgaged and nineteen-twentieths of the company's original share capital purchased by the Fiskus. Thus, to all intents and purposes, the Central railway became a State railway operated by the Ost Afrikanische Eisenbahn Gesellschaft acting in the capacity of a public utility concern, a fact which, as we shall see, became of vital importance for the post-war settlement.

The chief advantages of this far-seeing financial arrangement were the following : Funds being assured there was no need for protracted delays, which had been so disastrous on the Tanga line, and section after section could be taken under survey and construction with all reasonable speed. Policy being settled in the direction of a territorial through-line, the standards of survey and construction could be fixed accordingly and were, indeed, laid down in a most competent manner which, from the beginning, rendered certain for this Central line an excellence of alignment and execution nowhere equalled by other railways in Equatorial Africa. Finally, with security of prospective work for years ahead, enabling the contractors to improve their organization and to benefit constantly from their accumulated experience, contract agreements could be drawn up which, while safeguarding for the State economically sound construction, yet permitted sufficiently enticing profits to the contractors.

Anticipating these developments, the railway company, at its own risk, had pushed detailed surveys beyond Morogoro already in 1906-7 so that forward construction could start on the 16th June 1908, after only a few months' stoppage; and proceed smoothly to Tabora, railhead reaching this East African "emporium" on the 26th February and public traffic commencing on the 1st July 1912, fully two years ahead of contract time. Again, surveys beyond Tabora towards Lake Tanganyika had been started in ample time and construction had been approved by the Reichstag on the 12th December 1911, so that once more progress was not interrupted and Kigoma on the lake was reached on the 1st February 1914, fourteen months before contract time.\* The mean annual progress over the one thousand and forty-eight kilometres from Morogoro to Kigoma was, thus, at the astonishingly high rate of one hundred and ninety kilometres, the rate over the Tabora-Kigoma section being actually two hundred and sixty-six kilometres after an ingenious mechanical method of plate-laying had been introduced. From savings effected extensive realignments on the parent section from Dar es Salaam to Morogoro, and replacement of the original light permanent way by heavier material were commenced in 1912 but, unfortunately, not quite completed when war broke out. Neither were the port installations at Kigoma finished at the time although they were sufficiently advanced to allow the establishment of a naval base, and one of the two large lake steamers ordered under the construction contract, the *Graf Goetzen*, had been commissioned. After a hazardous history, including

\*Regarding details of progress the accompanying graphs should be consulted by the interested reader.

several years spent on the bottom of Kigoma Bay, this steamer, as the *Liemba*, is still doing useful work to-day.

The alignment between Morogoro and Tabora naturally followed the line of least resistance that had already served the Arabs for their great "slave route" with few and insignificant diversions, the most important of which was the technically excellent development on the ruling grade of only one in fifty up the double step of the "Rift Wall" at Saranda. The choice of trace from Tabora to the lake, on the other hand, gave rise to some hesitation and to several alternative surveys aiming for the ports of Kirando, Karema and Kigoma respectively. Technical as well as economic considerations finally left the excellently protected harbour of Kigoma an "easy first", all the more so when through the skill of the survey engineers a most elegant and comparatively cheap descent from the central table-land to the Luiche delta in the Tanganyika trough, an unavoidable drop of 320 metres, had been found [14].

Most of this great overland railway lies through comparatively flat or gently rolling country offering no real engineering difficulties. On the several sections on which the more accentuated ground of the East African shatterbelts had to be traversed works, naturally, became heavier though likewise nowhere of serious dimensions. The most unpleasant parts were the inundation plains of such major drainage arteries as the Ruvu, Mkata, Bubu Nyahua and Malagarasi with their heavy black clays, the last also requiring the only feature that may deserve to be called a major engineering job, the floating into position with the aid of the rising flood of the fifty-metre central girder span which had been assembled on pontoons at low water. However, there were plenty of other difficulties, inherent in the country, its climate and its peoples, that put a constant strain on the engineer and rendered life and work on survey and construction during those years of unrelenting forward attack far from easy. There was, first and foremost, the ever extant anxiety to keep the labour strength up to the mark—an army of fifteen to twenty thousand was the rule rather than the exception during peak periods—and it must be recorded in all fairness that this difficult task was, on the whole, very efficiently accomplished by a corps of large and small Greek sub-contractors temperamentally well suited to deal with native labour. Although they were much abused by their few German competitors and in the Press, it is safe to say that without them this Central railway would never have been so well, quickly and cheaply built. Next in importance came water: too much of it during the wet season, too little during the dry when in the more arid parts supplies of drinking water for the labour camps and of construction water for masonry often formed the most worrying part of the engineer's duties. To maintain the rapid rate of progress many of the bridges and culverts had to be built ahead of the plate-layers and this entailed the transport of many thousand tons of cement over long distances. Food transports to the advanced formation gangs in those long sections where local production of a scattered or non-

existing population was quite insufficient to feed massed labour, was another problem requiring constant attention. These transport difficulties were partly solved, on the central plateau at least, by a number of enterprising Sikh and Punjabi contractors who, in spite of tsetse fly, made excellent use of the sturdy and tough native donkeys which they "recruited" in Unyaturu, Usandawe and even in far distant Masailand.

The total cost of the Central railway can be taken at approximately M 111,000,000 which, at four per cent, represents an annual interest obligation of M 4,400,000. The published balance sheets show surpluses increasing steadily from M 94,000 in 1908 to M 1,778,000 in 1913, their actual value, however, being decreased by payments into a renewals fund to nothing in 1908 and to M 816,000 in 1913. As in the three years from 1911 to 1913 nearly half of the revenue was derived from the carriage of construction material, it is quite obvious that once this source of income had come to an automatic end in 1914, the prospects of "making both ends meet", let alone of contributing even a moderate part of the interest payments, were somewhat remote. In other words, the Protectorate's finances as a whole, no doubt indirectly on the increase through the ever growing mileage of its railways, had to bear practically the whole heavy burden of the latter with the help of the Reich's guarantee. In this connection it is well to remember that a highly remunerative source of railway revenue—enjoyed, for example, by the Uganda railway—was, and will always be denied to the Central railway as long as the country's administrative and commercial capital, with its large agglomerations of importing and spending communities, remains on the coast and thereby intercepts a large part of those luxury imports which might otherwise—as in the case of Nairobi, Kampala and Entebbe—swell the most highly rated railway traffic.

With the outbreak of war, only a few months after their most coveted goal had been reached, the Germans were doomed to lose whatever fruit their perseverance might have borne, and in 1916 set about to destroy what they had built with such honest effort and undeniably conspicuous success, when their retreating forces had to leave the railway. From the coast to Manyoni every single bridge and many a culvert and on the upper half all major bridges were blown up and most of the rolling stock destroyed with very little positive result: for within an incredibly short time Indian, South African and Belgian sapper companies and the engineers of the East African Protectorate Force—all gathered into a Railway Corps—had repaired all damage, admittedly "by hook or by crook", sufficiently to resume through-traffic with the aid first of road lorries put on railway axles and soon afterwards of engines and stock hurried across from India; and an astonishingly large number of German locomotives were quickly reconditioned.

#### (4) THE RUANDA BRANCH

The smooth and rapid progress of the Central line; the apparent increase in the country's trade, largely of course the result of the many millions of

“new money” pouring in in the shape of construction capital; an ever rising wave of conscious and proud optimism; and, last but not least, the fact that a powerful and highly efficient organization for building railways had taken firm root on Rufita hill at Tabora, the more than “semi-permanent” headquarters of the contractors; all this made it perfectly natural that a period of enthusiasm for more and more railways should have set in at the beginning of the second decade of the twentieth century. Not only was the colony itself seething with lust for internal expansion, ever eager to tap fresh sources of that legendary “dormant wealth”, dormant, that is, largely in the minds only of the colonists and their administrators, but home capital too seems to have fallen to the lure. In short, the question standing for discussion was not whether to build more railways, but in which direction?

The most obvious direction was, of course, that small north-western corner of Deutsch Ost Afrika, the inter-lake district comprising the mountain lands of Ruanda and Urundi, coinciding more or less with the present Belgian mandated territory, in which sat four million people—about one-half of the Protectorate’s total population—as yet hardly tapped, only tentatively administered by “Residents”, and practically untaxed. The eastern edge of this district could be reached by a line from Tabora, about five hundred kilometres long, two-thirds of which lay over gently rolling easy ground, to the great “elbow” of the Kagera River whence several hundred kilometres of navigable waterways penetrated deep into its mountainous heart. In 1912-13, therefore, the Governor, Dr. Schnee, in person, went to explore, accompanied by his Railway Commissioner; a reconnaissance party of government engineers followed in his footsteps; and during the 1913 dry season a strong party of sixteen contractors’ engineers produced more detailed contoured maps over a wide strip and also studied a more southerly route across the Malagarasi swamps advocated by an enthusiastic White Father from Urundi. Plans and estimates were submitted early in 1914 and it is interesting to learn from the covering memorandum [23, page 82] that the tax which the railway would permit to be at long last imposed on the natives of these far inland districts was considered ample and legitimate financial backing for the scheme. Accordingly, without a hitch, construction was approved, a first instalment of M 17,000,000 provided in the 1914 budget, and work northwards from Tabora could start early that year. Formation and bridgework on the lower one hundred and twenty kilometres continued during the first year of the war, and forty kilometres of track which had arrived by the last incoming boat, were laid, thirty kilometres of its rails being removed by the occupying Belgians in 1917 to complete their own Lukuga valley railway into Albertville.

In view of post-war development of the Tanganyika Railways, it is interesting to note that, prior to the war, the Germans had no intention whatever to join Mwanza and its rich and densely populated hinterland to the Central railway. This is evident from the memorandum accompanying the 1914 budget [23] which explains that technical and economic reasons, as well as a

correct rates policy—that is the prevention of a rates war—made it desirable to join Ruanda direct to the Central line instead, as had been suggested and explored, via the lake. Even more openly was this point stated by the Governor in another memorandum of February 1914 [24] wherein, after a thorough technical and geographical investigation of the ground, the idiocy (I feel this is the only word to use!) was, once and for all, knocked on the head of extending the northern railway to Lake Victoria through the deserts and semi-deserts of the Rift and the Serengeti: that parochial scheme of the Tanga and hinterland village pump interests which had always been dormant and had recently once more become more vociferous. The Governor said plainly: “The valuable districts along Lake Victoria are already opened by the Uganda railway. . . . Vast areas of the Protectorate are still awaiting development. For this reason the good British communications on the lake must be utilized and railways should be built in other directions.” Similar views had also been expressed in 1912 by the Director of the railway company thus [15]: “It seems advisable to leave for the time being to the Uganda railway the further development of the German regions along Lake Victoria. . . . More important and mainly for political reasons would be the construction of a railway to Lake Nyasa.” The aspect changed, of course, once war had broken out and a line from Isaka, where it would have branched off the Ruanda railway, to Mwanza was actually surveyed in 1915.

#### (5) OTHER GERMAN PROJECTS

Although the scheme of a third trunk-line from Kilwa to Lake Nyasa had been officially dropped, the Kolonialwirtschaftliche Komitee had in 1904 privately arranged for an extensive economic reconnaissance, and a lengthy report by the investigator, P. Fuchs, on his researches was published in the committee's organ in 1905 [7]. Towards the end of that year a survey party was sent to Kilwa by the Central railway contractors and surveyed a short distance of only eighty-six kilometres inland from the coast, the Maji-Maji rebellion stopping further progress. In 1907 fairly detailed surveys at the upper end of the line, from Manda Bay to Songea, were likewise made. In the meantime, however, the idea gained strength that the south-west of the colony could be best opened up by a branch line from the Central railway, cutting diagonally through its southern half, and a first reconnaissance was accordingly set going in 1907 [10], its leader being one of Holzmann's chief engineers who had gained a very high reputation on the Baghdad railway. Two alternatives were studied, one branching off the main line at Kilosa and gaining the Iringa highlands through the rough mountain land of southern Usagara more or less along the present road alignment and entailing several “rack-sections” and severe ups and downs. Thence it traversed Uhehe and Ubena and descended into the Usanga plain of the upper Great Ruaha River to Ilongo. The other alternative branched off in Ugogo, descended into the Ruaha drainage and followed the latter upstream likewise to Ilongo, access to Iringa being provided

by a short branch with a short ‘‘rack-section’’. From Ilongo the projected line rose into the volcanic highlands at Mbeya—again with a ‘‘rack-section’’ of considerable length—thence dipping into the upper Rukwa Rift from where it climbed on to the Unyika block (Mbozi) to gain the Rhodesian border below Fife. From there one branch swept eastwards to reach the north end of Lake Nyasa at Mwaya through the difficult valley of the Songwe River, and another branch westward, along the Rukwa-Congo and Rukwa-Tanganyika divides and then down to Kasanga, overcoming the drop into the Tanganyika trough by more ‘‘rack-sections’’; altogether a hair-raising proposition for reaching the two lakes over the worst possible ground, totalling one thousand two hundred and fifty kilometres in length and estimated to cost approximately M 360,000,000—or £18,000,000 (*sic*!)—a scheme fully deserving the oblivion into which it quickly dropped until, twenty years later, parts of it were resurrected in the shape of the ill-conceived Dodoma-Fife line!

Much more to the point were investigations conducted in 1907-8 and 1910-11 [17] which aimed at reaching the navigable stretch of the Kilombero River from the Rufiji or from either Ruvu, Ngerengere, Mikese or Kilosa on the Central railway, using this river as far up as possible, and then climbing over the comparatively low divide between its basin and that of Lake Nyasa to gain the shores of the latter at Manda Bay, the total distance being about eight hundred kilometres. An alternative led from the upper Kilombero to Ilongo across the highlands of Ubeni. This Kilombero scheme was uppermost in the German mind and would, no doubt, have closely followed upon the completion of their Ruanda line, a substantial sum for further more detailed surveys having been provided in the 1914 budget [23].

During the war—in 1915—a fairly extensive reconnaissance survey was run between the Central railway from Mikese to Kilosa and the Tanga line from Korogwe to Mombo with a view to determining the best alignment for linking up the two systems, a very desirable physical connection that had been temporarily achieved during the campaign by a tram-line from Kimamba to near Mombo built with material commandeered from sisal estates. Finally, a detailed survey was made in 1912-14 for a metre-gauge line from Lindi to Masasi through the Lukuledi valley, with an eventual extension to the middle Ruvuma in view.

## PART II

### THE PERIOD BETWEEN THE TWO WARS (1917-1939)

#### (1) TRANSITION FROM MILITARY OCCUPATION TO CIVIL ADMINISTRATION

To facilitate his invasion from the north General Smuts pushed a military railway from Voi on the Uganda line westward to the foot-lands of Kilimanjaro where it joined the Tanga line at Kahe, its length being one hundred and fifty-one kilometres. It was a bold enterprise in face of a ferocious enemy

who defended every inch of ground and, considering the grave military difficulties and the speed with which the line had to be built, one must not be too critical of its technical shortcomings: in parts where baobabs stood thick the plate-layers curved the track in and out between the giant trees rather than lose time on cutting them down to straighten the course; ups and downs were overcome wherever they offered obstruction by trial and error rather than by proper survey; timber bridges were decidedly shaky and water was piped over long distances from the Teita hills down into the thirsty desert regardless of expense. In 1917 a short branch of about twenty-five kilometres was laid southwards from Dodoma towards the Great Ruaha River, but was soon picked up again as the material was required for more important theatres of war. A short tram-line inland from Kilwa, likewise soon picked up again, and a longer one (ninety kilometres) from Lindi towards Masasi were found necessary during the "mopping up" operations in the south of the territory in 1917-18. As regards maintenance of the German railways all efforts were naturally concentrated on military objects and war damage repaired only in a very temporary fashion.

Thus, when the system was handed over to Civil Administration on the 1st April 1919 it consisted of the Central railway as far as Tabora (eight hundred and forty kilometres), the section from Tabora to Kigoma which had been captured by the Belgians in 1916 remaining in their hands until April 1921; the Tanga railway to Moshi, three hundred and fifty-two kilometres; and the Voi line of one hundred and fifty-one kilometres, most of which lay in Kenya Colony; giving a total length of one thousand three hundred and forty-three kilometres of metre-gauge track. To this must be added the Zigi branch line, twenty-three kilometres of seventy-five centimetre-gauge, and the ninety odd kilometres of the Lindi tram-line which, however, lay more or less derelict and was not at first operated. The Civil Administration's main task during these early years was, thus, "to straighten out the confusion consequent on the war and to work up an organization suitable for peace conditions, tasks not simplified by the fact that a permanent appointment to the post of General Manager was not made until late in 1920" [30, II, page 2]. To help with this organization Lieutenant-Colonel F. D. Hammond, R.E., was sent out by the Colonial Office as Special Commissioner for Railways in East Africa, making his recommendations and investigations between January and August 1921.

Probably the most important change brought about by the war in the field of railway administration is that the Tanganyika Railways—as they were henceforth to be called—formerly operated as commercial concerns by what for all intents and purposes must be looked upon as public utility companies, backed by Protectorate loans and guaranteed by the Reich, now became the concern of a Government Department. The immediate result was a large increase of staff, chiefly in the accountancy and clerical branches, a good comparison being afforded by the staff of the German company in 1913 and that

of the Central railway in 1921 serving, in both cases, the open-line section from Dar es Salaam to Tabora, the figures being :—

|           |     |     | 1913  |     | 1921  |
|-----------|-----|-----|-------|-----|-------|
| Europeans | ... | ... | 118   | ... | 117   |
| Asiatics  | ... | ... | 226   | ... | 455   |
| Africans  | ... | ... | 3,420 | ... | 4,420 |

A large number of men from India, recruited by the military railways from the Indian lines, remained in the Territory in permanent posts to which they brought their routine traditions acquired in the service of the powerful and wealthy Indian state and private railways. Indians also performed most of the work in the locomotive department for the highly skilled trades of which sufficient trained African labour was as yet not available, although steps were taken from the beginning to alter this state of affairs by schooling, apprenticeships, etc., until to-day the African plays his full part in all but a few most highly skilled branches. As the railways had been built to the metric system, with all its saving of time and labour, this system was retained, at least in the engineering and traffic branches, in the face of much adverse and narrow-minded criticism and even open obstreperousness by some of the staff.

One of the first problems to be decided after the war was the fate of the Voi line. Two main proposals stood for dispute: either to retain the line as the only route from Moshi to Mombasa, the upper section of the Tanga line being abandoned; or to pick up the Voi line track and use it for improving the Tanga line, thus retaining Tanga as the only port for the Moshi area. Colonel Hammond [30, I, Appendix 1]—mainly, it would seem, to benefit the new deep-water wharves at Mombasa on which £1,000,000 were being spent—strongly advised the first alternative: the last ninety-four kilometres of the Tanga line, from Same to Moshi, were to be picked up, leaving the agriculturally promising Lembeni section without rail connection, and seriously handicapping the physical joining of the railway systems of Tanganyika and Kenya; the material used for relaying the lower section at a cost of £55,000; and the Voi line to be turned into an efficient branch of the Uganda railway by realignments and improvements estimated at £360,000. Thus, for an expenditure of £415,000, plus the cost of the original Voi line material for which the War Office expected £50,000, the Tanganyika Railways would have lost the most promising part of their northern line's hinterland! This advice against which the engineers of the Tanganyika Railways fought tooth and nail, was not accepted; but neither was the Voi line removed with the result that, after it had been closed to traffic in April 1923, and after extensive reconstruction work, the Uganda Railway took it over and reopened it in February 1924. Thus, a first point of contact between the two neighbouring railway systems was turned, from the Tanganyika Railways' point of view in any case, into a permanent source of friction, although it may have been a good move in the interests of Closer Union.

A further legacy from the war was the Lindi tram-way which the Civil Administration had "inherited" at the considerable cost of £11,400 in a very bad state of repair. As its coastal terminus lay not in Lindi but high up the creek, near Mingoyo, its traffic was badly handicapped as it had to go by dhow or lighter to Lindi port, whereas country produce carried by porters went straight to Lindi. However, the line was there, and its existence led to much agitation by administrative and commercial interests to employ it for the evacuation of the produce from an alleged rich hinterland. It was, therefore, reopened for seasonal traffic in 1922 and operated with the available "locomotives"—in reality, derelict Ford cars on railway wheels—for three years, involving a net loss of £3,000 during that period. From 1924 to 1930 it was run by the District Commissioner with man power and, at the ridiculously high transport rate of eighty cents for the ton-kilometre, showed an aggregate profit of £4,700 for the first three years but a loss of £2,100 in the last two. Everyone, accordingly, breathed freer when, after prolonged investigations regarding its entire reconditioning at an estimated cost of £100,000 [36, page 6], this, in its actual state quite unsuitable, relic was finally disposed of by tender for a mere song in 1931.

The Zigi tram-line and sawmills, which formed part of the German Tanga railway system, were worked by the Tanganyika Railways during the first few years, until the timber resources gave out and the line was closed down in 1923, its track being offered for sale to plantation owners. Large sections of its well-graded formation were later converted into the main approach road to the East African Agricultural Station at Amani.

The last question arising out of the transition from German to mandatory rule was the vital one of capital adjustment. As regards the Tanga railway it was unchallenged fact that the line and harbour works had been the property of the German Government and that as such they became automatically the property of the Mandatory Power in accordance with the Versailles Peace Treaty. Matters were less simple with the Central railway which, at the time of occupation, had been officially treated by the Germans as the property of a private company, although the fact was, of course, well known that, with the exception of approximately M 1,000,000 (that is, the stipulated nineteen-twentieths of the original share capital of M 21,000,000) which remained in the hands of the original share-holders, the £5,500,000 representing the physical value of the line had been provided by a Protectorate loan. It was, therefore, held that "this sum was a debt owing by the railway company which, by virtue of article 120 of the Peace Treaty is now vested in the present Government of Tanganyika Territory", and that "all the company's property in the Territory became and is vested in the Custodian of Enemy Property" [34, pages 5-6]. A most intricate and interesting valuation case, lasting from the 13th to the 25th January 1925, had accordingly to be fought out before His Majesty's High Court between the Attorney-General and the Custodian;

with the result that "a sanguine purchaser might have given for the Central railway as on the 10th January 1920 the sum of £600,000, plus certain arrears of interest on the privately-owned shares, assessed at £14,000 [34, page 16]. Of this sum the Tanganyika Government received £580,000 in respect of the interest of the German Government in the company [42, page 5], so that a sum of £34,000 was eventually paid to the Custodian, this being the only German capital on which the present Railway Administration has to pay interest. This is a point of great importance if one wishes to gauge the results of post-war railway working which, through the fortunes of war, has never been burdened by interest payments on the capital expended to build sixteen hundred kilometres—or seven-tenths of the Territory's whole present railway system. The actual capital value of these sixteen hundred kilometres, as opposed to the commercial company value determined in the High Court case, and as it now stands in the accounts of the railways, was assessed in 1925 on the basis of the known construction cost decreased by war damage and the usual rate of deterioration: it is £4,014,000 for the Central, and £880,000 for the Tanga line [29, 1926, page 8], a sum representing an annual saving in interest—at four per cent—of nearly £200,000.

## (2) GENERAL HISTORY OF POST-WAR OPEN LINE WORKING

Having thus got rid, in our historical review, of the encumbrances left by the war, we can now turn to an analysis of the hopes, policies and historical facts that, together, form the story of the twenty years from 1919 to 1939. This story is, in reality, a constant dovetailing of the development of existing lines with contemplated and actual extensions. But in the interest of a smooth narration it seems to me advisable to separate the account of the open lines from that of extension schemes and achievements, a procedure perfectly justifiable if the reader will oblige by remembering that the total length of the system gradually grew from 1,676 kilometres (including sidings) in 1923 to 2,386 kilometres in 1934 by the successive additions of the Tabora-Mwanza line (379 kilometres) in 1928, of the extension from Moshi to Arusha (86 kilometres) in 1929, and of the Manyoni-Singida-Kinyangiri branch (150 kilometres) in 1933-4, together with an equivalent increase of sidings from 76 to 171 kilometres.

The fundamental policy, overshadowing everything else, conducted with energy and push and, to some at least, with at times over-enthusiastic optimism, was to fight against the deficiencies which were the outstanding and inevitable feature in the railway budgets during the earlier years: (1) by developing and attracting as much traffic as possible, both internal and external, with the help of tapping promising areas of production by new branch lines; (2) by reducing working expenses; and (3) by re-equipping the lines, sorely depleted of locomotives and rolling stock and partly in need of heavier permanent way, so that they would be able to carry, at decreased working cost, that increased traffic without which they could not pay their way. It must, however, be

confessed that even the best of efforts in these directions on the coastal sections of the Tanga line could not entirely eradicate the sins of the original builders and surveyors, so that to this day, and probably for ever, the line from Tanga to Mombo remains the weakest part of the system.

As regards *traffic*, the two main sources were the increase in the Territory's agricultural productivity, both native and non-native, and thereby indirectly that of purchasing power and with it of the best paying railway traffic, that is highly-rated imports; and traffic from—mostly mineral—and to the Congo. Tanganyika's own mining activities were nowhere and at no time of sufficient importance to influence railway revenue substantially and when, in the mid-thirties, a promising goldfield was opened up near the south-west corner of Lake Victoria, its traffic fell automatically to the Kenya and Uganda Railways which were much more conveniently situated to cope with it. An attempt to sketch the fluctuations of these two main sources of railway revenue, the one largely dependent on a very unreliable climate and the other on equally unreliable international relations, will be made later in this story.

If we now turn to the second aim of railway policy, the reduction of *working expenses*, it is gratifying to note that the ratio of revenue to expenses dropped from 139 per cent (that is expenses 39 per cent more than earnings!) in 1923-24 to 70 per cent in 1930-31. In the following year, owing to the insetting world depression, the figure soared up again to 91 per cent. Drastic reduction of staff became inevitable in 1932, amounting to a decrease of Europeans from 316 to 174, of Asians from 1,140 to 495 [*sic*!], and of Africans from 11,400 to 7,070. This, together with other severe curtailments, quickly brought about a further marked improvement, the ratio reaching an almost unsafe minimum of only 49 per cent in 1937, since when it is fluctuating round about 55 per cent, a figure that compares very favourably with the results obtained on similarly placed railways elsewhere, although the fact cannot be denied that purposely neglected maintenance is partly responsible for it.

The essential *re-equipment* was achieved by heavy expenditure of fresh borrowed capital: £1,155,000 for new locomotives and rolling stock, the first six British main-line engines having arrived in 1924, and a total of thirty-two, including four heavy "Garratt" monsters, having been commissioned by 1933, in addition to many shunting units; £307,000 for enlarging workshops and modernizing machinery in order to maintain these large increases in proper running order; £444,000 on relaying one hundred and sixty-two kilometres on the Central line, and ninety-two kilometres on the Tanga line with heavier permanent way; and £94,000 for improving siding facilities; a total of £2,000,000 spent essentially for the purpose of meeting the expected traffic increase!

To replace some of the worst damaged major girder bridges by new structures £48,000 were expended, the great majority of girders, however, remaining to this day as they emerged from the war in a patched-up condition, a state of affairs that caused the engineers much anxiety and led to protracted

and, on the whole, satisfactory investigations regarding their safety [29, 1933, page 13 and 1934, page 16]. Improvements of water supplies, always a difficult proposition in a semi-arid country, accounted for another £48,000 of capital expenditure. Even the Germans had failed to equip their lines with satisfactory and reliable watering stations and it took ten years of unrelenting pressure on the part of our engineers to persuade the authorities to a recognition of the fact that water supplies needed urgent reinforcement. In 1930, at last, drilling plant and staff of ample capacity to achieve this was obtained, but after two years of useful endeavour work closed down during the world depression in 1933 and was never seriously resumed, with the result that its water supplies are still the weakest part in the engineering branch of the Tanganyika Railways.

As a counter-feature to always threatening water shortage in the dry season stands the abundance of flood waters during the rains. Hardly a year goes by without traffic stoppages due to washaways, slips and more serious wholesale destructions. Fundamentally the cause of this accelerated run-off is the following "vicious cycle", now fully realized by the geographically-minded engineer, which I had described in 1936 to the Royal Scottish Geographical Society as follows: "A new railway is built to 'open up', as we say, a new area. Bridges and culverts are designed in accordance with the existing natural run-off, largely dependent on the type of vegetation cover. The inhabitants of the land adjoining the railway are induced to increase their agricultural and pastoral output in order to create traffic for the line. By doing so they destroy the natural vegetation, a process leading to increased run-off. To prevent breaching of the banks the original culverts must be increased in number and width, and new capital has thus to be spent every year to counter the ravages of 'development'. Whilst the burden of interest rises, productivity of the soil, harvests and freights diminish. The vicious circle is completed" [49, page 247]. Apart from much money derived from revenue votes spent on making good these annually recurring damages, £323,000 had to be found through capital loans for the same purpose, £257,000 of which went into a costly realignment of thirty-one kilometres of the Central line in the danger zone of the upper Mukondokwa valley at Kidete. This is the main artery of discharge from a vast agricultural and pastoral basin and has, so to speak, to carry the sins of its developing hinterland. The debacle took place in 1930 and has since been repeated, to a lesser degree, in the lower valley above Kilosa in 1937.

The railways themselves are not always free from blame as their engineers, together with their colleagues, the road engineers, have in the past sinned much by paying too little attention to correct and safe drainage of the country their structures traverse; but on new constructions, like the Singida line, this problem has been overcome at considerable cost. The main blame, however, rests with those who continue to permit uncontrolled agricultural and pastoral exploitation of the land, and until this has been stopped the vicious circle just

described is bound to continue its adverse influence on railway finance. On the other hand, the serious flooding of the Usinge swamps in 1930, a backwater of the Ugala-Zindi drainage, necessitating an expensive raising of the line mistakenly laid across them by the Germans; and the repeated flood troubles in the Luiche delta near Kigoma, cannot be charged against "man-created accelerated erosion" but have their cause in peculiar geographical and hydrographical conditions, now well understood but overlooked by the builders of the line.

The rapid increase of European and Asian staff from 150 and 665 respectively in 1922 to 218 and 950 in 1927, and the fact that German ideas of operating the lines differed fundamentally from our own as regards numbers, race and distribution of personnel so that both type and sites of the quarters originally provided by them fitted badly into the new conditions, made further capital outlay on staff quarters inevitable, the large total of £215,000 having been invested during the first decade of our administration. Sundry minor improvements and unallocated capital works of a value of £52,000 brought up the total of new capital expended on open lines to the far from despicable total of £2,700,000 [29, 1939, pages 112-13]. But even so, certain serious arrears of maintenance were never really overcome, the worst neglect being a continuous deterioration in the originally very high standard of ballasting the track; and the entire elimination of the periodically necessary regrading of formation which has been in abeyance since 1920. Bridges and buildings likewise have at no time received sufficient attention to make good the rather high rate of deterioration in a tropical climate. All this was fully realized by the retiring General Manager when he wrote in his last annual report, for 1934, as follows: "During the very difficult period through which we have passed, demanding as it did the most rigid economy, expenditure on the maintenance of railway property has been sufficient only to keep that property in being and to prevent its serious deterioration. Much that should and would have been done in normal times has been deferred until the arrival of better times. This policy cannot be continued indefinitely and unavoidable expenditure must be faced in the not far distant future to overtake arrears of maintenance and renewals" [29, 1934, page 27]. Conditions, however, do not seem to have sufficiently improved since this was written and arrears of maintenance are still heaping up.

Following the custom in other African dependencies the Tanganyika Government found it expedient and eventually profitable to entrust its Railway Administration with operating the country's *Port and Marine Services*. As early as 1923 a steamer service was established on Lake Tanganyika with the aid of two small vessels, the *Mwanza* and *Fifi*, and the far from easy task of raising the large German steamer, which had been sunk during the war, and again afterwards during Belgian occupation of the port, was begun. The service developed promisingly but was interrupted in 1925-26 owing to boiler

trouble in the *Mwanza*—when the Belgian marine gallantly stepped into the breach—until, in May 1927, the *Graf Goetzen* was at long last recommissioned and, as the *Liemba*, started a regular service to the Northern Rhodesian port at the south end of the lake. The Kigoma quay wall, left unfinished by the Germans, was completed and lengthened by the Belgians, and the large slipway reconditioned, works involving a capital expenditure—including the salvage of the *Liemba*—of £70,000.

In November 1925 the Marine Department, originally started as an independent government department, was absorbed by the railways, whereby the latter became responsible for coastal shipping, lighting and mooring, as well as for operating the dockyard at Dar es Salaam, responsibilities calling for further capital investments of £411,000. This included the purchase of the steamer *Azania* (£27,000), extensive enlargements of the Dar es Salaam wharf and harbour installations, works requiring expert advice from a London firm of consulting engineers, occupying a special construction staff from 1926 to 1933, and costing £302,000; and heavy repairs to the Tanga wharf as well as minor improvements at the ports of Lindi and Mikindani, totalling to £32,000. Lately it also became necessary to rebuild the derelict old German piers on Lake Victoria at Bukoba, Mwanza and Musoma, involving a further £45,000.

Of *minor enterprises* connected with railway activities the following deserve mentioning: From 1921 the Nyanza Salt Works on the Malagarasi River at Uvinza were operated by the railways until November 1926 when they were taken over by a private company in which Government retained a share of interest. And at several up-country stations, for example, Dodoma, Tabora and Kigoma, the railway workshops provided electric current to the towns until these services were gradually absorbed by a monopolistic electric power company working throughout East Africa.

The problem of *railway land*, although tackled as early as 1922 in a report [32] which was considered to “form a convenient basis for the settlement of a very difficult question”, and although a tacit acceptance by Government of its recommendations has been assumed ever since, has not, in my opinion, really been solved. No progress had been made by 1928 with the final demarcation of railway reserves either on the old or new lines [29, 1928, page 76], nor were General Hammond’s views of 1930 accepted who strongly urged [42, pages 57-8] that all railway land, thus far administered, in principle, by the Land Department, should be handed over to the railways; that occupied by the Germans free of charge and that required for new lines against payment for disturbance only. However, except for a certain feeling of vagueness, no real difficulties have ever arisen with these reserves which essentially consist of the so-called sixty-metre strip (thirty metres on either side of the line) between stations, wider areas at stations of sizes varying in accordance with their importance, and of certain additional lands for railways and ports in the major townships.

It is out of the question to give in a short history anything but the mere outlines of *traffic movements* although ample material exists for their close analysis in the accumulated statistical reports published every year by the Railway Administration. Besides, the average reader would only be bored by having to wade through such an analysis and will, no doubt, be satisfied with a few characteristic glimpses of some of the more interesting events. The fundamental rates policy, tenaciously and rightly adhered to, is one by classes in which high value imports that can well stand high railway charges, balance at least partly the low export rates on country produce which alone make possible competition for these latter from the far inland regions of Africa on the world's markets, and thereby indirectly but very markedly help the general prosperity of the country.

The minimum goods traffic of 59,000 tons in 1922 rose steadily during the first post-war decade to the highest maximum ever attained, of 319,000 tons in 1930-31, then dropped disastrously to about 200,000 tons in 1933 consequential on the world depression. Since then it has kept fluctuating between 220,000 and 270,000 tons annually, with a solitary second peak of 303,000 tons in 1937, due to the rare occurrence that all three native main crops, grains, cotton and groundnuts, had simultaneous good weather and good markets and that coffee too kept near its maximum. The bulk of the country's export traffic being agricultural produce, these fluctuations from year to year, due to good and bad seasons and to favourable and unfavourable markets, are, of course, inevitable and render correct estimating of railway revenue practically impossible. Take groundnuts, for instance, admittedly the most insecure: in 1926-27, when the Mwanza branch first made its influence felt, the tonnage carried was 6,600; it rose to 10,000 in the following year, kept between 15,000 and 18,000 from 1929 to 1935, with two drops to only 7,000 in 1930 and 1934; then soared to 21,000 in 1936 and 1937, and in 1938 and 1939 tumbled to the unprecedented minimum of a bare 3,000 tons, recovering only slightly in 1940 to 6,700! In the same period grains fluctuated irregularly between a minimum tonnage of 15,000 and a maximum of 39,000, and cotton with cotton seed between 5,800 and 21,000. Only the Territory's staple export, sisal, showed a very satisfactory gradual and almost steady increase from 17,000 tons in 1926-27 to 65,000 tons in 1938, a peak from which it has since dropped a little to 60,500 tons. The drawback to this safest traffic, however, is that practically all this sisal is grown within only three hundred kilometres from the ports and therefore does not enhance the earning power of the railways' long inland sections.

Another instructive example of the precariousness of revenue prospects is the copper traffic from the Congo on which some had put such high expectations whilst others saw in it merely an ephemeral event bound to come to a sudden end once the Belgians had developed their own *route nationale* to the Atlantic coast. This traffic, handicapped by four transshipments on its long

overland journey from Katanga to Dar es Salaam, started with 1,800 tons in 1923, had risen to 19,000 tons in 1925-26 and after a slight drop in the following year, attained its first peak at 30,000 tons in 1928-29 and a second at 34,000 tons in 1930-31 when Congo traffic represented one-half of the revenue of the Central railway [29, 1932, page 5]. After this the copper traffic rapidly diminished and ceased entirely in 1933. Except during the period 1925 to 1927 when the Congo imported heavy railway material via the East Coast to hurry up the completion of its competing lines, thus temporarily providing good balancing import traffic for its copper exports, the carrying of the latter was a very one-sided business demanding a lot of empty trains running up to the lake.

Far, therefore, from having been a permanent blessing, the lure of this copper traffic and—if the historian is permitted to recall the geographer's warning voice—an over-optimistic view of future agricultural development which persistently overlooked the geographically determined limitations to the Territory's own productivity, led in the second half of the 'twenties to the fatal mistake of extrapolation: looking at the pleasing curve of increasing traffic volume the actual rate of this increase was projected forward into the 'thirties and steps taken to cope with the greatly increased traffic thus calculated by further heavy capital expenditure, a striking example of the latter being the large and costly new marshalling and goods yard at Dar es Salaam with its new connecting line to the wharf, lying idle to-day as proper "white elephants". Not only did the prophesied expansion fail to take place, but the universal depression threw development back and it took several years before recovery became noticeable for many staple commodities. In 1931 and 1932 a reduction in income of 38 per cent had to be faced while fixed interest charges had increased by 63 per cent in the same period [29, 1932, page 6]; and the total tonnage carried in 1939 (229,000) was approximately the same as ten years earlier (232,000 in 1928-29). It is interesting and pathetic to read the confession—after the event—in the annual report for 1933 [29, 1933, page 6]: "It is difficult to see how this country can produce enough agricultural produce to make the railway pay. It has not the rich hinterland of the Kenya and Uganda Railways with its long haul traffic untapped by competition. It must, therefore, be a hope that mineral deposits will prove really valuable as the settlements they entail and the general wealth engendered would go far to put the railway on its feet. This railway has not even a large town inland to create traffic." It is not easy to reconcile this statement with the renewed hope expressed a little further down on the same page, thus: "Earlier years show, however, that native production can still be very much increased, and it is hoped that the great efforts now being made by the Provincial Administration will shortly show very increased results."

A further complication affecting the earning power of the Tanganyika Railways was created by the tapping of the Lake Victoria Basin, already well served by the Kenya and Uganda Railways, when the new branch line reached

Mwanza and established a second point of competition much more important than the first at Moshi due to the Voi line. The fact that the term "rate-war" became taboo—although one cannot help thinking that it is a correct one—does not remove the other fact that serious difficulties had thus been introduced. Although it is true that almost complete assimilation of rates with the Kenya and Uganda Railways was eventually reached, resulting incidentally in a reduction on certain important commodities and thus in a loss of revenue to Tanganyika [29, 1930, page 8]; and that after protracted negotiations a final agreement in 1937 looks like having smoothed out the difficulties, this is by no means the case as a concise account of the present situation in the annual report for 1937 and the striking diagrams in that for 1939 make amply clear [29, 1937, page 56; 1939, pages 29-30]. And no one can deny that the whole of the highly rated coffee tonnage from Bukoba in the Tanganyika Territory part of the Victoria Basin, and the bulk of the coffee from Moshi and Arusha goes to Mombasa and not to Dar es Salaam and Tanga.

The world-wide event of the *Road-Rail Competition*, the direct and inevitable outcome of the fantastic development of the internal combustion engine in the wake of world oil production, naturally also reached East Africa to the detriment of the earning power of its railways which it threatened to rob of a good deal of their most highly classed import traffic. However much one welcomes the advent of efficient motor services as feeders of the existing railway trunk-lines, one cannot, in poor and new countries that have invested large sums of capital in these trunk-lines which they need, in any case, to handle their lowly rated exports, countenance this competition on roads parallel to the railways. In Tanganyika the subject was first broached in the General Manager's 1930 budget speech in Legislative Council, and during the following years legislation was introduced entirely preventing the carriage of goods for profit between points which compete with the railway. This protective policy of licensing control was endorsed in 1937 by General Sir H. O. Mance in his report to the East African Transport Policy Board [48, pages 20-23].

Finally, mention must be made of the introduction, in 1929, of a local passenger service by "Sentinel" rail coaches which proved a great success on the coastal section between Tanga and Mombo, especially after the track had been strengthened, and went far to counter the competition by passenger road 'buses [29, 1934, page 9]. An experiment with these coaches on the Moshi-Arusha extension in 1934 did not prove a financial success.

As with the history of the Tanganyika Railways' traffic that of its *finance* can only be treated in a cursory manner, all the more so as the intricacies of financial statistics, of which the railway reports pour forth avalanches every year, are not a strong point of the present historian! The outstanding facts that might appeal to the general reader are the following: The total capital invested in the railways and allied services [29, 1939, pages 112-13] is, in a round figure, £10,000,000 of which 4.9 million represent the value of German

capital at the time of taking over, on which as I have shown, no interest is payable, and 5·2 million British capital on which the total debt charges were £312,000 in 1939. This capital was provided by a 5-per-cent Exchequer Loan (£1,284,000), by three 4½-per-cent and 4-per-cent Guaranteed Loans (totalling £3,654,000), by 4-per-cent loans from the Tanganyika Government (£46,000) and by free grants (£130,000). It was used for:

| Improvements of open lines including the |     |     |     | £          |
|------------------------------------------|-----|-----|-----|------------|
| Lindi tram-way                           | ... | ... | ... | 2,697,000  |
| Survey and construction of new lines     | ... | ... | ... | 1,890,000  |
| Lake Steamer Service                     | ... | ... | ... | 59,000     |
| Port and Marine                          | ... | ... | ... | 468,000    |
| Total                                    |     |     |     | £5,114,000 |

[29, 1939, page 82]

No provision for *renewals* was made until 1936 and the arrears at the end of 1939 are estimated at £1,256,000, the amount for the year 1930 being £109,000. These figures do not include any provision for renewal of German assets as it was considered that, these having been taken over at practically no cost, replacements might fairly be met from capital account [29, 1939, page 12]. The chief reason for having failed to finance a renewals fund is, of course, that the railways still carry a heavy burden of debt represented by borrowings from Territory funds to make good past losses in working. The way out—if it is a way out!—devised in 1936 was that annual payments of £50,000 should be made by the Territory, as repayable advances, from its general surplus revenues into a railway renewals fund, so that any railway working surpluses that may accrue can be devoted to the liquidation of the present outstanding debt while at the same time a new debt will be built up consisting only of advances—and very meagre advances at that!—for financing the renewals fund [29, 1939, page 9]. The historian's duty is merely to record this, to him at least, somewhat incomprehensible procedure!

The heavy deficits in railway working of the earlier years, totalling £765,000 between 1919 and 1924 [29, 1926, page 4] took on more reasonable dimensions later. Instead, however, of following the ups and downs of railway finance during the last twenty years, it will prove of greater interest to the reader, I think, to be shown what the real financial position was at the end of 1939, a year in which the total tonnage carried was 229,000, that is well above the average of 200,000 tons for the preceding eighteen years. Thus he will be able to gauge the value of its railways to the Territory after twenty years of development and just before they are once more subjected to the new war's "inconstancies of fortune", as Don Quixote would have put it. Taking railways and port and marine services together we find the following straightforward figures in the annual report for 1939, here rounded off to the nearest thousand pounds: Gross earnings £713,000, working expenditure

£427,000, leaving net earnings of £286,000, or a satisfactory efficiency ratio of 60 per cent. The actual British debt charges for the year were £312,000 and the assessed contribution to a renewals fund—not actually made—£109,000. After payment of the debt charges the total “excess of expenditure over receipts” was £26,000, the figure usually referred to as the railways’ annual “deficit” [29, 1939, pages 11-12].

If, as has been done in former reports, one works out the percentage on the British capital of £5,114,000 represented by net earnings less renewals assessment (that is £177,000) one arrives at the comparatively satisfactory figure of 3½ per cent, an entirely misleading one, however, in the historian’s opinion. For to gauge the real working results of the system one should obviously deal with its whole capital value, its whole debt charges—whether or not these are actually payable or paid—and its whole renewals commitments. If one does so, guessing at the unknown German capital value of the ports as £250,000, one arrives at the following, let us call them, “virtual” figures :—

|                                                                                                                                     |               |
|-------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Total capital invested ... ..                                                                                                       | £10,264,000   |
| Total debt charges on this sum, the German part calculated at 4 per cent ... ..                                                     | £ 518,000     |
| Total renewals for 1939, with German portion taken at £110,000 ... ..                                                               | £ 219,000     |
| Percentage on total capital represented by net earnings less total renewals for the year (£286,000 less £219,000 or £67,000) ... .. | approx. 0.65% |
| “Virtual” deficit for the year (£286,000 less £518,000 less £219,000) ... ..                                                        | £ 451,000     |

This figure is a very different picture of the truth, one must admit; and be it remembered that from all these calculations the accumulated arrears of renewals—estimated for the British assets only at £1,147,000—have been omitted!

What, then, do these figures convey? Firstly, that from the purely operating point of view the Tanganyika Railways are economically run and are “paying their way”—and will, no doubt, continue to do so in future—if by that phrase is meant that income exceeds operating expenditure. Secondly, that the system is suffocated by its debt burden and would be much more suffocated if an earnest attempt were made to provide adequately for renewals, a state of affairs which even a doubling of the country’s productivity and with it a doubling of the present gross earnings could only partly mitigate. Thirdly, and notwithstanding this severe handicap from the purely “commercial” point of view, it would be quite wrong to look upon the railways as a bankrupt concern. To the contrary, they should be credited with the indirect benefits they confer on a country which, without them, simply cannot be run efficiently and economically and which, therefore, should frankly admit its gratitude and responsibilities by carrying the so-called railway “deficits” as a correct charge on its general resources, just as expenditure on national defence has always and

everywhere been recognized as an obligation of any country's total finances and not of the fighting services! This opinion would still hold good, if post-war capital expenditure had, say, been £2,000,000 less—the percentage on capital rising, in this case, from 0·65 to 0·8 per cent only—and by offering it the historian does not wish to absolve the railways from certain mistakes in the past, when at times more capital than was, perhaps, justifiable was expended owing to an over-optimistic gauging of the Territory's developmental possibilities, a view that will be further elaborated in the last chapter.

A few *milestones* in the Railways' history deserve a short mention. The period of expansion came definitely to an end when the first General Manager, who had taken over his heavy task late in 1921, retired after fourteen years' service at the end of 1935. After a year's "interregnum" the new General Manager took over the perhaps even more arduous task of consolidating the expanded system into the Territory's best possible servant. A Railway Advisory Council had been created in September 1932 whereby the General Manager's responsibilities to his Government were somewhat lightened. The first visit by Colonel Hammond has already been recorded; as Brigadier-General he returned ten years later, in 1930, and left a long report containing many criticisms and recommendations [42], one of the latter being the separation of the General Manager's and Chief Accountant's offices which had been combined for some time past, a move entailing the appointment of a Deputy General Manager. He also strongly urged the establishment of a renewals fund. The ponderous findings of the East Africa Commission of 1924 [35] and of the Commission on Closer Union, the so-called Hilton-Young Commission of 1929 [37] contain important references to railway policy and extensions. The year 1930 saw the report of the Tanganyika Railway Commission under Sir Sidney Henn, without doubt a weighty document on railway development which will be discussed in the next chapter [43]. Then came Mr. Roger Gibb in 1932 to conduct an investigation of railway rates and finance [46] which, among other matters of a highly technical nature, once again suggested the closing down of the upper section of the Tanga line; the pooling with the Kenya and Uganda Railways of the traffic from and to the Tanganyika Territory ports on Lake Victoria; and winds up with the amazing statement of the author's "very strong opinion" (page 53) that "rather vague ideas about territorial development should not be accepted as a substitute for a satisfactory railway balance sheet." This may be an ideal attitude, probably justifiable in those parts of Africa which glory in the temporary exploitation of great mineral wealth, or possess an agriculturally rich hinterland, but is certainly inapplicable to a country of such severe geographical limitations as Tanganyika Territory. This fact had already been clearly stated, or re-stated, in Sir Donald Cameron's memorandum of October 1925 wherein he said plainly [36, page 8]: "If a railway may not be built in Tropical Africa because there is doubt whether it will pay the whole of its working expenses and debt charges within such

a brief period as five years, little, if any, railway expansion can take place in this Territory . . . . and it is reasonably certain that if additional railway facilities are provided considerable development may be expected with consequent benefit to the revenue indirectly." None of Mr. Gibb's suggestions seems to have been accepted by the Secretary of State [47]. Finally, Brigadier-General Sir H. O. Mance gave us his views in 1937 on Co-ordination of Transport [48]. The Tanganyika Railways can, thus, not complain of not having had their fair share of outside advice from imperial experts at, in the aggregate, considerable cost!

### (3) RAILWAY EXTENSIONS : SCHEMES AND ACHIEVEMENTS

Relieved from having to grapple with and from attempting to make palatable to my readers the complicated problems of railway traffic and finance I can now turn to a field more germane to my taste and one in which, for fifteen hard but pleasant years, I was allowed to play an important role.

The first reference to future extensions of the Tanganyika Railways is contained in Colonel Hammond's report of 1921 [30, part III]. He advocated the early reopening of the Sanya extension to the Voi line, built and picked up again by the military authorities in 1916; but suggested to wait with an extension to Arusha "until the Tanganyika Government considers it is in a position to bear the initial losses". Like the Germans, he saw the chief hope of the Central railway "centred on Lake Tanganyika and the Congo traffic", with an eye also on Northern Rhodesia; and repeated the erroneous idea of the lake "forming an admirable [*sic*!] catchment area for traffic that can be developed at comparatively low cost". He therefore recommended the establishment of a marine service on the lake, amalgamated with the Railway Administration, by raising the *von Goetzen*. Of branch lines he only mentioned a short one south from Ngerengere or Kilosa if certain reported mineral deposits should be proved.

Simultaneously I had been asked to give my own views on railway extensions which I did in a lengthy report submitted early in 1922 and based on intensive studies of all the accumulated material left by the Germans, as well as on such personal knowledge of the country as I possessed. Full of youthful enthusiasm backed—perhaps unavoidably—by my chief's pushful energy; without, as was inevitable at the time, any realization of the great advances to be made during the next ten to fifteen years with efficient motor transport; and, above all, lacking an intimate appreciation of large parts of the Territory and therefore considerably misled by the optimism of our predecessors, I was no doubt over-optimistic myself—though not entirely void of guarded cautiousness—when I drew up the following "likely programme for railway development during the next thirty to fifty years" [31, pages 30-31]: (1) A southern railway from Ngerengere to Amelia Bay (Manda) on Lake Nyasa, to be built with as little delay as possible to the upper end of the Kilombero plain, the upper division to follow as need arises. (2) Simultaneously a "Rift Valley

Railway", as a physical link between the two existing separate systems, should be taken in hand, the Moshi-Arusha section at once and further sections in yearly instalments, construction being pushed in both directions from Arusha and Dodoma. (3) Then the following feeder lines, as the future development of the country may require, in what looked like a reasonable order of urgency : Upper Kilombero to Ubena, Dodoma to Iringa, Kimamba to Tuliani, Mwanza to Kahama (note the place in the order and the insistence on building from Mwanza South !), eventually to be continued to Tabora; and Ruiga Bay, a little south of Bukoba, to the Kagera River. The report wound up by strongly pleading for a far-seeing policy of extensive railway reconnaissance surveys in order "to make the choice of the most economical alignments possible when the time arrives for construction, and thus to avoid the usual gross mistakes, the inevitable consequence of decisions based on hurried surveys and entailing not only wasteful construction but also much more serious, because accumulating, waste in working". These recommendations found the full approval of the General-Manager who, more particularly, re-emphasized the fact that the Tanganyika Territory part of the Lake Victoria Basin was already served by the Kenya and Uganda Railways.

Soon afterwards pressure started from several directions urging Government to take up again at long last the development of the Territory's railway system, so energetically furthered by the Germans and now having been allowed to stagnate for nearly four years after the termination of the war. Something, obviously, had to be done even at a time when the country's finances were hardly in a position to incur large-scale capital expenditure, and when, moreover, railway deficits were piling up at an alarming rate. And the cheapest way to appease the stirring spirits was to make use of such relics as the war had left us : the Sanya extension of the military Voi line, and the first, almost completed section of the German Ruanda line northwards from Tabora to Kahama. For the first of these schemes Colonel Hammond's recommendations came in handy, but why a move towards Mwanza was suddenly favoured whereby the General Manager entirely reversed his strong opinion held only a year or two previously, remains dark. The interests of the Dar es Salaam Chamber of Commerce, administrative ambitions, and, perhaps, the ever dormant "Drang" towards union with Kenya, probably all played their part.

Thus, the ill-conceived *Sanya Branch* was started at the end of 1923 and completed in December 1924. It took off the Tanga line ten kilometres south of its Moshi terminus, climbed a lava ridge at the foot of Kilimanjaro, and jolted on to the open Sanya plain where a fly-free terminus was ready to hand for the transport riders from Arusha. Built of ramshackle and relatively expensive old war material on a partly still existing formation, and following a wrong alignment that left Moshi as a dead-end, the line cost £26,000 and served no one in particular as the transport riders had mighty little transport to ride and such traffic as existed preferred the lorry which was not afraid of

tsetse. But, thirty-three and a half kilometres had been added to the Tanganyika Railways!

Even before the *Tabora-Kahama* line actually commenced after considerable delays early in 1925, I had been ordered to survey its extension from Isaka—where the old German Ruanda line swung westward towards its goal—to Shinyanga, which I did between April and June 1924 along an alignment dictated by the wishes of the Administration rather than by correct technical considerations. Thus, when the first section had reached Isaka early in 1926 after its progress had been seriously impeded by the heavy rainy season of 1925-26, authority for proceeding immediately had been obtained and Shinyanga was reached by the end of the year. A preliminary survey thence to Mwanza had been set going in 1925 and was followed by the final location survey between March and September 1926, with both of which I was never associated owing to my absence on other duties connected with the southern railway exploration and on home leave. This first half of the eventual Mwanza line, smuggled in, so to speak, as an innocent branch feeder into Tabora from what was then the northern part of Tabora District, proved a very cheap addition of one hundred and ninety-seven kilometres: the first one hundred and twenty kilometres on an existing well built formation with all its culverts and practically all its bridges complete and found in a remarkably sound state of repair after ten years of lying idle, only required minor repairs and adjustments; and for one hundred and sixty kilometres of its length free permanent way material was available in the shape of lighter track just replaced by a heavier one on the coastal section of the Central railway. The total cost to the present Administration was thereby reduced to the ridiculously low figure of £263,000 or only £1,335 per kilometre [29, 1928, page 13].

The surveys from *Shinyanga to Mwanza* are easily explained, for in 1924 the East Africa Commission had been making its investigations with the result that, with regard to communications, their report said [35, page 122]: "In our opinion the most urgent new railway construction is the completion of the Tabora-Kahama line to Mwanza"; an opinion which, though no reason for it can be traced in the report, was eagerly accepted by Government [36], and the necessary funds were asked for and approved through the 1926-27 estimates. Thus, both surveys and means having been excellently managed, construction continued uninterrupted, railhead reached Mwanza in April, and the whole line was opened for public traffic on the 15th August 1928. The average progress over this section was at the rate of one hundred and forty kilometres per annum thanks to the very efficient organization of a financially strong and energetic local firm of Greek contractors. The one hundred and eighty-two kilometres from Shinyanga to Mwanza pier had cost £631,000 or £3,470 per kilometre, a low price achieved through a far from wise saving on formation, ballast, bridging and, chiefly, on drainage which has since resulted in much additional expenditure. However, there the line is, with all its implications regarding rates policy and its difficulties of maintenance! Incidentally, and

contrary to what early German writers [for example 2, page 118] anticipated and the East Africa Commission reiterated [35, page 120], namely that Tabora would form a wealthy "collecting junction", this former African trade emporium into which the produce from a vast area had flowed on the heads of porters or on lorries, as was to be expected became a dying market with its former "wealth" now passing its railway station booked through to the coast!

The extension of the Tanga line from *Moshi to Arusha* was an obvious further step which might have been taken at once instead of wasting time and money on the temporary branch to Sanya. The East Africa Commission had added its own recommendation to that of the local experts, but contrary to the latter suggested retaining the old Sanya line, a suggestion fortunately not accepted. Accordingly, in the Governor's Memorandum on Railways, of October 1925, construction was strongly advocated and funds were inserted in the 1926-27 estimates. The survey started in April 1926 and, requiring only the re-establishment on the ground of the well chosen alignment staked out by the Germans as long ago as 1912, was completed in October of the same year. It was perfectly clear that the impossible trace of the Sanya line's lower part could not be retained. It was, accordingly, scrapped, the new line branching off at Moshi and joining the Sanya line at kilometre thirteen. Construction, however, only commenced in November 1927 and progress, largely owing to labour difficulties of the contractors, was not very satisfactory; but Tengeru, the main station for the coffee estates on the lower slopes of Mount Meru, was opened for traffic in November 1928, and the whole line inaugurated by the Governor in December 1929. Although this extension has not, perhaps, fulfilled the high expectations of those who advocated it, it forms without doubt a sound and comparatively cheap addition of eighty-six kilometres to the Tanganyika Railways. It has cost £316,000 or approximately £3,700 per kilometre which, though the track is a light one (only forty-five pounds), is by no means exorbitant if one takes into account the difficulties of bridging a number of deep gorges radiating from Kilimanjaro and Meru.

Seeing that the Arusha settlers were getting their railway, those from Upper Sanya and Ngare-Nairobi started agitating for a short branch leading from the Sanya plain to their plateau settlements between the two great volcanoes. A preliminary and most unsatisfactory survey of such a line was made in 1927 by incompetent personnel and the whole problem more thoroughly ventilated and surveyed in 1928, with the result that construction was confidently recommended in 1929 [38] and endorsed by General Hammond [42, page 79] and by the 1929 Development Committee [40, page 26]. Sanction was obtained in due course, preliminaries for construction had commenced in February 1931, and bridging and other material had arrived from England, when the scheme was dropped owing to the inseting depression and after £10,000 had been spent on it.

The last extension to be undertaken was the much talked about branch line from *Manyoni to Singida and Kinyangiri*. Already, in his 1925 Memorandum

on Railways [36, page 6], the Governor had written that "from the strictly commercial point of view the line would seem to be the most attractive proposition that we have before us". Such views were based on a serious misconception of the geographical environment. Put concisely, the argument used for justifying this branch was as follows: "In Ugogo, traversed by the Central railway, 170,000 people under a pushful administration had in the course of ten years been stimulated to produce an ever increasing tonnage for export. Why, then, should not the 270,000 people of Singida-Iramba likewise become exporters under the blissful influence of a railway, especially as their tribal habits are, on the whole, very similar to those of the Wagogo?" To this the following counter-argument was frequently pointed out but, unfortunately, not listened to: "The geographer would have pointed out this vital difference: the Wagogo, relying upon widely scattered though precarious water supplies, had ample room to extend their fields without getting too far from water. The people of Singida, and to a lesser extent those of Iramba and Mkalama, were, on the contrary, already living with their large herds in a highly congested state, on narrowly circumscribed 'oases' with a centrally situated water supply, and surrounded by barrier tracts uninhabitable owing to the lack of permanent water. Ten years of intensified productivity had already seriously depleted the soil and water resources of Ugogo, and any increase of productivity on the high blocks of southern Singida and of Iramba, if possible at all, would lead rapidly to wholesale deterioration. The geographer would, thus, only have approved of railway construction under the condition that further sums were made available to provide water in the arid wastes surrounding the oases, and to instal expensive preventive works to combat soil erosion" [49, pages 245-46].

As early as 1926 a preliminary and quite useless survey was made from Itigi on the Central railway to Kinyangiri and beyond, and early in 1927 an alternative was studied proving Manyoni to be a more suitable junction for a line northwards. The location survey along this alignment started in 1928 and was completed early in 1929 as far as Singida and in 1930 to Kinyangiri, the estimated cost of the line being £557,000. A very optimistic report by the General Manager was forwarded in a despatch [39] in which the Governor thought it preferable to defer the project "if there is a prospect of a suitable road-unit being produced within a reasonable time". This report stated that the line would produce a revenue of £50,000 to £70,000 a year after five years! The scheme, which also received the 1929 Development Committee's [40, page 26] and General Hammond's [42, page 79] enthusiastic approval, was duly sanctioned. Construction started in September 1930 at contract rates which represented a very marked drop from those customary in the Territory, largely due to the world-wide depression and the consequent quantity of cheap labour available [29, 1931, page 2]. The line was opened to Singida by the Governor on the 31st July 1932 and Kinyangiri was reached early in 1933, but this last section, owing to a severe rainy season, was only sufficiently

consolidated to take public traffic on the 1st April 1934. The length of the line, which is laid with new light (forty-five pounds) permanent way, is one hundred and fifty kilometres, its actual cost £537,000 or £3,700 per kilometre, and the average rate of progress only sixty kilometres a year. A free grant of interest for the first two years was given.

The railway reports for 1937, 1938 and 1939 contain a very detailed and careful analysis of the working of this ill-conceived branch showing that total receipts, which were so optimistically put down at £50,000 to £70,000 after the first five years by its originators, gradually rose from £5,000 in the first year to £19,500 in the fifth year (1937), and in 1938 dropped to near £10,000, with a slight recovery to £13,000 in 1939. The actual annual deficits fluctuated between £19,000 and £38,000, and aggregated in 1939 to £262,000 with, and to £205,000 without, actually existing though not provided for depreciation liabilities! Very justly, therefore, the General Manager says: "It seems practically certain that the branch will remain a burden to the Territory until the debt has been amortized", that is in 1971 [29, 1939, page 26]. Thus, while opinions may, and do, differ regarding the wisdom of the Mwanza extension, there can no longer be the slightest doubt that the Manyoni branch was a grave blunder.

Having thus described the actual achievements in the field of railway development during the first fifteen years of the mandate, we must now turn back again to the year 1925 for a short account of other schemes which never materialized. Essentially, these schemes were to penetrate into the south-west of the Territory, and to join the Central to the Tanga line by a south-north link, both schemes recognized as of primary importance in 1922 already [31], and both fully endorsed by the East Africa Commission in 1924 [35, pages 120-22] and in the Governor's Memorandum on Railways of 1925 [36]. As their investigation inevitably brought in its trail the problem of the so-called East African Through-Line—an idea foreshadowed by the East Africa Commission—it will be convenient to deal with both schemes jointly. Before doing so, however, one must refer gratefully in quite general terms to Sir Donald Cameron's ready acceptance and constant furthering of the pleading for extensive surveys by which a great deal of knowledge in many directions was gained and broad strips of country more or less accurately mapped for the first time; surveys which, thus, have formed a valuable asset to the Territory's Government although from the railways' point of view their results proved largely negative [29, 1933, page 14].

July 1925, accordingly, found the first reconnaissance expedition in the field with the task to explore a route leaving the Central line somewhere between Ngerengere and Kilosa, running up the Kilombero plain, gaining the Indic/Nyasa divide through the Pitu valley, a southern Kilombero tributary, and descending to the lake in the Ruhuhu drainage. A wide strip of country was covered, including excursions and detours to Mahenge, the

Iringa-Dabaga highlands, southern Ubena, Songea and the Livingstone mountains, the expedition's report being despatched from Tukuyu early in February 1926. Whilst the engineers with their faithful Wanyamwezi porters were staggering painfully through the wilderness of the Pitu valley and the tumbled sandstone scenery of the Ruhuhu depression, the advance-guard of the "Delamere Invasion" (in a despatch of 1930 [44, page 7] it is referred to as "in the main a political conception") from the north had arrived, the "attack" on the south-western highlands as a desirable area for a virile white settlement culminating in the famous Tukuyu Conference. There, enthusiastic settlers from Kenya, Rhodesia and Nyasaland thrashed out their ideas at the derelict mission station of Rungwe. At the same time, the Governor had undertaken an arduous safari to gauge for himself the country's possibilities and returned with a mind favouring a line across the grain of the mountain-land from Dodoma to Iringa, Mbeya and Mbozi, and preferring it to that of least resistance which the engineers were trying to evolve by skirting the technically most difficult ground of the high blocks to the east and south-east. But instead of running a competitive reconnaissance along this Dodoma-Fife route, as it became to be known, two costly tacheometric parties, one at each end, were organized in 1926 to stake out the "Delamere line" straight away. Fortunately, they had not proceeded very far when in 1927 it was recognized that the only right thing was to run a reconnaissance over the still untouched long section (five hundred kilometres out of the total length of seven hundred kilometres) between the two terminal location parties.

The investigations included an approach from Itigi in the north along the easier terrain of the continental divide towards Mbeya; and an alternative descent from Iringa to Msagali on the Central line, seventy-three kilometres east of Dodoma. They started in June and were completed in November 1927, the second report, somewhat delayed by many other duties, being submitted in February 1929. As a result Sir Donald Cameron decided that both reports should be published in a combined and abbreviated form. The document was duly produced by the end of the year [41] and, as was fully anticipated, drew much abuse from the Southern Highlands where the ranks of the British settlers had been swollen by the "duplicating" invasion of German land pioneers, subsidized by their own government!

The investigations, extended to the northern links alternatively from Kilosa or Dodoma, had been conducted throughout with an eye on the geographical foundations, whereby much of the optimism expressed in the old German survey reports and more particularly their project of using the navigable stretch of the Kilombero River were proved exaggerated or futile. The reports, therefore, widely exceeded the limited, purely technical aspects of the various alternative schemes, their recommendations, based on carefully drafted premises, being the following: A line from Dodoma to Fife on the Rhodesian border can only be looked upon, technically and economically, as an impossible proposition

and can in no circumstances be recommended; further reconnaissance and detailed surveys should be made at once, and be followed as soon as possible by construction, from Kilosa (or Kimamba) north- and southwards, the northern line being pushed in order to realize as early as possible physical connection with the Tanga line and Kenya, the southern extension into the Kilombero proceeding at greater leisure. At a convenient moment, say after four or five years, if the highland development justified such a step, and if the Government of Northern Rhodesia could be induced to let Dar es Salaam share in its expected copper traffic from north-eastern Rhodesia (it never came into being!) one might build on, either to Lake Nyasa or to Ubena. The best "Imperial Through-Line", should such a venture become desirable, was considered to run from Manda Bay (with transhipment from the western coast of Lake Nyasa) via the Pitu and Kilombero valleys to Kilosa and Korogwe where it would find already existing through-connections northwards. And finally, and mainly to give the doubts regarding a link between Dodoma or Singida and Arusha a more substantial foundation, to make a rapid reconnaissance of the intervening ground.

Just before the publication of these recommendations, the committee appointed to submit proposals under the Imperial Colonial Development Act, on which three of its ten members represented the settlers' interests, had unanimously advocated the immediate construction of the line from Kilosa to Ifakara in the Kilombero plain and of another from Dodoma to Iringa, as well as a detailed survey from there onwards to Ilongo with a view to extension from Iringa as soon as the first section was completed [40, page 28]. The views of General Hammond, who happened to be in the Territory and was asked to comment on the report, were that "the question as to which route should be chosen for the southern line has been 'clouded' by the demand for the so-called 'Imperial Link' ", for which he could see no adequate justification; but he insisted on seeing the south-west opened up and recommended a combination of the two competing alignments, from Kilosa to the Kilombero and thence via Ubena to Fife, largely, it would seem, to avoid competition with Nyasaland and the Zambezi bridge of which latter he himself had been one of the chief sponsors. He also advocated a line from Arusha to Dodoma or Singida [42, page 99].

In the middle of 1930, finally, the Tanganyika Railway Commission under the chairmanship of Sir Sidney Henn, who had come out from England for the purpose, started its "delicate" task, taking as basis for its deliberations my own and General Hammond's reports. It represented fairly all interests, travelled widely through the highlands, and submitted its own report in September 1930, accompanied by a large volume of the evidence taken. Its recommendations were [43, page 23]: Immediate construction from Kilosa to Ifakara; construction from Dodoma to Ubena Junction via Iringa "on the assumption that His Majesty's Government will provide the capital free of

interest for at least twenty years" [*sic*!], the Chairman and the Indian representative dissenting; construction from Kilosa or Kimamba to Korogwe or Mombo, the General Manager dissenting; survey and construction of feeder roads as an essential part of any railway programme, and attention to road-train experiments; early investigation of transport and irrigation in the Kilombero valley. In short, a clear victory for the geographical "school" of railway planning. The Governor, in a despatch of October 1930 which deals with the Commission's findings [44], endorses the Kilosa-Ifakara scheme if there is a reasonable chance of its paying at the end of five years; and regrets that he has to disappoint the Iringa settlers and all those "who have formed extravagant ideas with regard to the Southern Highlands". And so ends the Dodoma-Fife phantasmagoria.

Reconnaissance and tacheometric surveys from Kilosa north and south were undertaken between 1931 and 1933, the tacheometric survey to Ifakara forming a most successful experiment with a policy of using Royal Engineer officers seconded from the War Office. They resulted in detailed estimates for the lines from Kilosa to Korogwe (£1,800,000 for 305 kilometres) and to Ifakara (£1,125,000 for 175 kilometres) but the construction stage was never reached due to the outbreak of the world depression. A new survey of the navigable Kilombero stretch by a retired Royal Navy officer in 1931 made it necessary to review, once more, the whole question of using the river for transport with the result that a long memorandum written in 1932, again on the geographical basis [45], finally, it was hoped, put a stop to all contemplation of such a scheme. It has, however, once more and after eight years of hibernating, put out its hydra's head in the report by the 1940 Central Development Committee, proving again the old commonplace that the more hopeless, the more contrary to the dictates of nature a concept of the human mind is, the longer it takes to die. A far-flung and carefully conducted reconnaissance between Dodoma, Singida and Arusha was made between August and December 1930, and clearly confirmed the technical difficulties and economic drawbacks anticipated of a scheme so closely linked up with the Singida fiasco. The results of all these surveys and investigations were never published and now rest peacefully in departmental files. But they have greatly increased our knowledge of facts, and successfully dealt with fancies so that their cost represents money well spent.

#### (4) A GLIMPSE INTO THE FUTURE

When Kinyangiri was reached in 1934 railway extensions, amounting in the aggregate to 710 kilometres, or three-tenths of the Tanganyika Railways system's total length, seem to have come definitely to an end, as one cannot assume that the two branches north and south from Kilosa, although approved in principle, will ever be built. Increased knowledge of the country's productive possibilities and limitations and the fact that a search during more than fifteen years has not brought to light anything that might develop into

a major mineral field have clearly shown that traffic from any one of the existing small areas of higher productive value will never be sufficiently bulky to justify the inevitably heavy capital outlay on new properly graded railways with their costly track of steel and their locomotives. On the other hand, the cost of haulage by motor lorries has constantly decreased during the last fifteen years or so and will, no doubt, continue to decrease as general efficiency and reliability in working such vehicles even on bad roads is improving; and the time is not far distant when road haulage rates will almost have come down to the level of the higher railway rates especially if, by running its own feeder services, the Railway Administration is put in a position to work out remunerative combined road plus rail rates. By turning, therefore, main attention in future to such combined services the traffic from each individual minor lateral area of production, insufficient in itself to pay for a feeder railway, can and will be efficiently coped with by roads; and at the same time the combined traffic from a growing number of such local nuclei of production and consumption will help to raise the tonnage to be carried by the existing trunk-lines. Personally, I have no doubt that suitably designed road-trains will greatly further development in the indicated direction and that the admitted failure of the experiment with one such unit in 1935-36 was due to its design, unsuitable for East African conditions, and not to any snags inherent in the general principle. However, whether worked by road-trains or by fleets of lorries, or by both, feeder roads will no doubt be the policy of the future, just as they have already in the past dealt with all traffic from and to the Southern Highlands at an almost negligible fraction of the capital cost that, say, a Dodoma-Fife railway would have demanded. Furthermore, except perhaps to the larger areas, such feeder roads need by no means be expensive "all-weather" roads, as generally they will have to carry only agricultural harvests restricted to the dry season. That such views should emanate from an engineer at the end of a long career devoted to railways, may sound strange but will become immediately comprehensible if one admits that a civil engineer's primary qualification should be his adaptability to the changes in the physical and economic environment he is serving with his structures.

The engineer-historian, on the other hand, after this tentative excursion into a field new to him, may perhaps be permitted to conclude with a Vision: If and when the Territory is made to share in those generous, interest-free imperial loans of which one hears so much at present, a few millions might be obtained for the purpose of liquidating all actual railway debts and for putting a railway renewals fund on a satisfactory basis, whereby the existing trunk-lines might be turned into a reliable, regular and substantial revenue earning concern; instead of asking for five million pounds for an extravagant road system, as has recently been suggested.

Dar es Salaam,

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## Musira and its Burial Caves

By A. Sillery

MUSIRA ISLAND lies just south of east of Bukoba and stands like a sentinel at the approaches to the port, about two miles from the shore. It has its place in history, for in 1875 Stanley spent a night there during his circumnavigation of the lake, having been inhospitably driven away from the shores of what is now the Bukoba District (H. M. Stanley : *Through Darkest Africa*, pages 140-144). The island is roughly three-quarters of a mile in extreme length by half a mile in extreme breadth, and rises sharply from its western and south-western aspects, which are thickly wooded, to high cliffs on the northern, eastern and southern sides. The north-eastern peak overlooks a tongue of land, partly rock, partly bush and bordered by a reedy swamp, which projects some distance from the foot of the cliff. The other cliffs fall abruptly either to a narrow beach or more or less sheer into the lake itself. From the summit, which is covered by thick tufted grass, the view is superb, and though I could discern nothing to correspond to Stanley's description of the "bold, majestic mass" of "Alice Island", nevertheless the coastal cliffs round Bukoba, the islands of Nyaburu, Makibu and Kerebe (probably "Alice") and the Bumbiri group form a picture lovely enough.

The forest to the south-west shelves down to a stony beach appropriately called Kishekulo, from *lushekulo*, meaning a pebble in Kihaya. The northern cliff is called Ikurunga, that is, of rounded shape, the north-eastern point Lutunga, a swamp, and the southern and south-eastern sides are known as Omumahanga; *mahanga* means indentations made by water or by other means.

These caves, to which access is obtained by a narrow and pebbly beach at the foot of the cliffs which must be more than one hundred and fifty feet high, are not dissimilar from those caused by the action of the sea on any coast, for example, Sea View at Dar es Salaam. I was shown three caves in all. One of these, deeper than the others and much overgrown by vegetation, appears to have been scoured out by some human agency, for there is a small recess at the far end which certainly does not appear to be natural; otherwise it shows no sign of human use or habitation. But the other two, which are fairly shallow, natural indentations in the rock, have evidently been used in the past as a burial ground, for they contain large quantities of human bones. These bones are of persons of both sexes, and Dr. G. A. Macgregor, who accompanied me on one of my visits to the island, found that in some cases they had become mummified and were in a good state of preservation. They lie in well organized layers, with the heads towards the entrance of the cave, each body in its burial cloth of matting, now very tattered, and it seems that each layer, or perhaps each body as it was placed there, had been covered

with stones.\* Dr. Macgregor and I also found a few bones in a very small cave in the forest just above Kishekulo.

One tradition has it that in times far beyond human memory the caves were used for the disposal of the bodies of people who had died of small-pox (*burundu*), and of a disease which from the description resembled dysentery (*nsheshe*). These diseases, I was told, were introduced from Uganda and were regarded as so contagious by the ancients that they would not permit the bodies to be disposed of in the usual way.† The people of the neighbouring lake shore therefore decided to place them on Musira. Similar burials are said to have taken place on Kitua, the most northerly island of the Bumbiri group and some seventeen miles from Bukoba.

But I am informed on more reliable authority that the above tradition is not true, and that in fact the bodies were taken there by the relatives of the dead for fear that they might be stolen and used by wizards for nefarious purposes, if disposed of in the usual way on the mainland. This practice, so I am told, was observed until comparatively recent times and Mwami Lwamgira tells me that on a visit to the caves in 1905 he found fresh bodies there, several having been deposited within the previous few days.

The name of the caves, *Nyanga za Bakara*, 'caves of the Bakara', is probably derived from the fact that this tribe was the first to use them, or perhaps used them more extensively than other peoples of the lake shore. The northern limits of Bukara, or Kanyengereko, as it is now called, is still only three or four miles from Bukoba; in ancient days it is said to have been even closer and included Kitendaguro, on the hill overlooking the present township. The Bakara were therefore within comfortable distance of the island which in olden times may indeed have been regarded as part of Bukara, though it is now included in Kiamtwara.

Musira was not only a cemetery; it was also a shrine where the sick might find health and the needy a change of fortune. The chief of Kiamtwara still appoints a guardian or priest, of the Mugwe clan, who lives on the mainland and whose duty it is to take to the island every year a white sheep, a white cock, and a load of coffee. This cult, so I am informed, has nothing to do with the spirits of those who are buried there, but is devoted to the *genius loci*. The office of guardian is now a sinecure, as the cult has fallen into disuse.

I was also informed that in early German times a number of people lived on the island, and there are certainly traces of cultivation near Kishekulo. These people were ordered to move on the outbreak of war in 1914. The island is now used by fishermen as an occasional camp.

\*Stanley does not mention these caves, though, in the course of a ramble, he found six decomposed bodies on a ledge at the north-east corner of the island. He concluded that the bodies were of strangers who had been murdered. He did not go round to Omumahanga, but climbed through the forest up to the grassy summit.

[NOTE.—These caves were recognized by Dr. F. Stuhlmann in 1892 as burial caves "for the members of the more prominent families" (*Emin Pasha Expedition*, page 698-9), one being marked as such on his map of the environs of Bukoba (*Mitt. D. Sch.*, Vol. V.)—C.G.]

†Smallpox was present in East Africa, at least on the coast, in the 'thirties of the last century (H. H. Scott: *History of Tropical Medicine*, page 79, Vol. I).

## NOTES

### Praying for Rain in Ugogo

*By A. V. Hartnoll*

IN UGOGO the word for chief is *mtemi*, a word which is probably derived from the Chigogo word *kutema*, to cut, as it was the ancestors of the present *watemi* who came up from the south, felled the first trees in Ugogo to clear their new homesteads and became the religious, judicial and administrative heads of the community which grew round them. One of the *mtemi*'s most important religious duties is that of intercession with God for rain and he is the custodian of the stones that are used in the second of the two annual ceremonies of prayers to God for rain that are described here. These stones are kept on the *mtemi*'s *igoda*, or stool, in the *ikulu*, or hut of the senior wife. Colloquially the stones are referred to as "the *igoda*," and are described as "male" or "female" according to their shape, two different kinds being the male and one only—a ring-shaped stone—the female. Some *watemi* have over a hundred of these stones, others only a few. As they have been collected in the bush in the course of years, their number is an indication of the fortunes of the family in the past.

Early in the season, when the first rains of the year have abated and the grain is about four feet high, the *mtemi* goes to a *mganga*, or soothsayer, and asks him at which ancestral grave it is auspicious to sacrifice. The *mganga*, who usually belongs to a pastoral semi-Nilotic tribe similar to the Masai and locally known as the Balaguyu, obtains the ancestor's name by the use of a divining board or by direct revelation from a dream and the grave nominated will be that of one of the *mtemi*'s ancestors. The *mganga* names the day and nature of the sacrifice, which includes native beer and a black ox or sheep, after which he takes no further part in the proceedings.

On the day of the ceremony the slaughter animal is led to the grave, children pour water over it for purification and the assembly, male and female, adults and children, all dance round the sacrificial animal singing: "*Mulungu, Mulungu, tuli wana wako. Chink'he invura.*" ("God, we are your children. Give us rain.")

The sacrificial animal is slaughtered, usually by the *mtemi*'s sister's son, who cuts out the liver and the heart and divides them into six pieces. He throws one piece to his left, one to his right, one in front, one behind, one into the air above and the last below on to the ground. Beer is poured over the grave. After feasting on the meat and the remainder of the beer, the

people return to the *ikulu* and dance and sing in the cattle-fold. The ceremony is concluded by the senior wife of the *mtemi* sprinkling water from a cooking pot over the assembly when all sing words similar to these: "*Mavunde semula imvura ilatonya*," meaning, "clouds gather so that the rain may fall."

The second ceremony is towards the end of the rainy season, just before the grain ripens, when the *mtemi* again approaches the *mganga*, who nominates a suitable day in the manner already described. A fat black sheep is selected and on the day nominated the community collect at the cattle-fold of the *ikulu*. Children draw water and pour it over the sacrificial sheep for purification; the people dance and sing; the stones are brought out on their stool, and the sheep is slaughtered by members of the *mtemi's* household. The stones are thoroughly cleaned by washing with water and, having dried, are plastered with the fat of the sacrificial sheep. The ritual of dividing the heart and liver into six pieces and scattering them to left and right, front and rear, above and below, takes place, after which the stool bearing the stones is placed on the roof of the *ikulu*, there to remain till the crops ripen, though some of the stones may immediately be returned to the hut. After the conclusion of the ceremony the people are purified by having water sprinkled over them, as before.

## CORRESPONDENCE

THE EDITOR, *Tanganyika Notes and Records*.

### METEORITES AS CELESTIAL RAM-BONES IN THE BELIEF OF TANGANYIKA NATIVES

Dear Sir,—Mr. F. Oates in his article on the meteorites of Tanganyika Territory, published in *Tanganyika Notes and Records*, No. 12, December 1941, pages 28-31, cites a remark of Mr. O. Guise-Williams that meteorites are present "amongst the sacred objects handed down the line of successive hereditary chiefs". From my own experience, confirming his remark, I can add some further details which may interest your readers from an ethnological view-point.

During my stay in Kabende as manager of Sibwesa Mica Mines, in the hinterland of Karema, local natives in my employ disclosed to me the fact that their tribal ruler, Chief Pandasharo of Bugwe, is using in sacerdotal ceremonies the "bone of a ram" (!) which had dropped from the sky. Unfortunately I could not persuade the chief to show me these sacred "bones", anxiously concealed from the profane eyes of Europeans. I guess, however, that they might be the fragments of a meteorite of a comparatively recent fall, although my Wabende porters, who accompanied me on a prospecting journey in the uninhabited mountain region of Buhorohoro on Lake Tanganyika, regarded talc-schist with superstitious awe as being "ram-bones" falling from heaven. Perhaps some remote resemblance in the appearance of the talc-schist with the sacred "bones" of Chief Pandasharo misled them to take it for a meteorite. The boys were very surprised when I explained to them the real nature of the talc-schist.

In any case, the belief of the Wabende tribe of a *ram* as celestial body is worthy of notice, as it touches a significant ethnological problem. I also remember having seen the late Chief Mkoma of Unyamanga wearing the horns of a ram as sacerdotal headgear on a wig-like cap of blackened cotton-wool and a lambskin over his left shoulder, which points to the same mystic cult of an apparently foreign origin so far as the Bantu race is concerned.—Yours faithfully, EGON FR. KIRSCHSTEIN.









