

REPORT

ON

TANGANYIKA TERRITORY,

Covering the period from the conclusion of the
Armistice to the end of 1920.

Presented to Parliament by Command of His Majesty.
July, 1921.



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Map to illustrate boundaries of districts, telegraphs, railways, cables,
and game and forest reserves.

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I.—GENERAL INFORMATION.*

By Article 119 of the Treaty of Peace with Germany, signed at Versailles on June 28, 1919, Germany renounced in favour of the Principal Allied and Associated Powers all her rights over her overseas possessions, including German East Africa; and the Principal Allied and Associated Powers, in virtue of their rights of sovereignty over the territories which formerly constituted German East Africa, have agreed that His Britannic Majesty shall exercise, in conformity with Article 22, Part 1 (Covenant of the League of Nations) of the above-mentioned Treaty of Peace, a mandate to administer a portion of the said territories. This portion of the former German East Africa Colony is known as the Tanganyika Territory.

(a) **Boundaries.**—Tanganyika Territory is bounded on the east by the Indian Ocean, from the Uмба River in the north to the Rovuma River in the south. From the mouth of the Uмба River the northern boundary runs approximately north-west to the intersection of the first parallel of southern latitude with the eastern shore of Victoria Nyanza. This boundary, however, makes a curve round the foot of Mount Kilimanjaro, which mountain is included in Tanganyika Territory.

The Principal Allied and Associated Powers have agreed that His Majesty the King of the Belgians shall exercise, in conformity with Article 22, Part 1 (Covenant of the League of Nations) of the Treaty of Peace with Germany, a mandate to administer the area situated to the west of the following line, which, pending the appointment of Boundary Commissioners to trace the line on the spot, forms the western boundary of Tanganyika Territory to the point where the southern boundary of Urundi meets Lake Tanganyika: "From the point where the frontier between the Uganda Protectorate and German East Africa cuts the River Mavumba a straight line drawn in a south-easterly direction to point 1640, about 15 kilometres south-south-west of Mount Gabiro; thence a straight line in a southerly

* Throughout this Report reference has been made to, and some information culled from, Professor Hans Meyer's *Ostafrika* (1914), *The Handbook of German East Africa*, which was prepared on behalf of the Admiralty and War Office in 1916, and *The Economic Resources of the German Colonies*, published in the Bulletin of the Imperial Institute 1914-15.

direction to the north shore of Lake Mohazi, where it terminates at the confluence of a river situated about $2\frac{1}{2}$ kilometres west of the confluence of the River Msilala; if the trace of the railway on the west of the River Kagera between Bugufi and Uganda approaches within 16 kilometres of the line defined above, the boundary will be carried to the west, following a minimum distance of 16 kilometres from the trace, without, however, passing to the west of the straight line joining the terminal point on Lake Mohazi and the top of Mount Kivisa (point 2100), situated on the Uganda-German East African frontier about 5 kilometres south-west of the point where the River Mavumba cuts this frontier; thence a line south-eastwards to meet the southern shore of Lake Mohazi; thence the watershed between the Taruka and the Mkarange and continuing southwards to the north-eastern end of Lake Mugesera; thence the median line of this lake and continuing southwards across Lake Sake to meet the Kagera; thence the course of the Kagera downstream to meet the western boundary of Bugufi; thence this boundary to its junction with the eastern boundary of Urundi; thence the eastern and southern boundary of Urundi to Lake Tanganyika."*

The western boundary of the Territory then follows the middle of Lake Tanganyika to its southern end at Kasanga (formerly Bismarckburg), whence it goes south-east to the northern end of Lake Nyasa. Rather less than half way down the lake it turns east and joins the Rovuma River, whose course it follows to the sea.

The adjoining territories are as follows:—On the north, Kenya Colony and Uganda; on the West, Belgian Congo; on the south-west, Rhodesia and Nyasaland; and on the south, Portuguese East Africa.

The coast line is about 500 miles in length. The total area of Tanganyika Territory is about 365,000 square miles, or 20,000 square miles less than the total area of ex-German East Africa.

Three large islands lie off the coast, viz: Pemba and Zanzibar, which form the British Protectorate of Zanzibar, and further south, Mafia, with an area of about 200 square miles, which, although included in Tanganyika Territory, has hitherto been administered from Zanzibar.

(b) **Physical Features.**—Along the coast lies a maritime plain varying in width from 10 to 40 miles.

The coast is protected by coral reefs, behind which lie numerous lagoons fringed with mangroves and coco-nut palms. The entrance to the harbours are, as a rule, shallow, and must be approached with caution.

From the maritime plain the country rises gradually to the plateau which constitutes the greater part of the hinterland. The average altitude of this plateau is between 3,000 and 4,000 feet. It is bounded on the east by the following mountain ranges, beginning from the north: Pare, West Usambara, Unguu

* The boundary described above is shown on the British 1: 1,000,000 map G.S.G.S. 2932, sheet Ruanda and Urundi.

(Unguru), Usagara, and Uhehe. The last-named range bends westward to the northern point of Lake Nyasa.

The inland plateau falls sharply from a general level of 4,000 feet to the level of the great lakes (Tanganyika 2,590 feet and Nyasa 1,607 feet).*

The difference in level between the coastal belt and the plateau highlands is regarded as due to extensive faults that run for the most part in a roughly north and south direction and play an important part in the tectonic features of the whole of Eastern Africa. These faults are responsible for the extensive rift depressions (*Graben* of German authors) which intersect the upland plateau and in certain of which the great lakes and the soda lakes occur.

Lake Rukwa, near the south of Lake Tanganyika, has commonly been regarded as the southern point of the main or Great Rift Valley, which runs northwards across the inland plateau at a height of from 2,000 to 4,000 feet to Lake Naivasha in Kenya Colony and beyond, but in the opinion of Suess, there is a break in the continuity of the Rift Valley of 350 miles between Lakes Manyara and Nyasa, with only a depression in the neighbourhood of Kilimatinde on the line between them. The non-existence of the Rift Valley in this district is supported by Uhlig and O. E. Meyer, and according to the former the Great Rift Valley is replaced by a fault-step and is quite different in age, form and direction from the Ruaha and Nyasa Rift Valleys. But Professor Gregory† shows that there are many indications that the Nyasa Rift is connected with the Great Rift Valley; and is of opinion that the Great Rift Valley extends from northern Palestine to southern Africa. It includes seven chief sections: that in Palestine and Sinai; the Red Sea and its branches, the gulfs of Suez, Akaba and Aden; in Abyssinia; in Kenya Colony; in Tanganyika Territory; the southernmost section from Lake Nyasa to the Sheringoma Plateau; and the western branch including Lake Tanganyika and the Upper Nile.

The highest points in the Territory are in the north-east where the extinct volcano Kilimanjaro, the highest mountain in Africa, rises to 19,720 feet, whilst a little to the west is Mount Meru (14,955 feet). In the south-west are the Livingstone Mountains where the highest peak is over 9,000 feet.

The only known active volcano is Ol-doinyo Lengai (God's Mountain) at the south end of Lake Natron. This volcano was very active in 1917 and the whole surrounding country was strewn with lava.

(c) **Lake and River System.**—Portions of the great lakes of Central Africa are included in the Territory, viz., the southern portion of Lake Victoria, the eastern shores of the lower part

* Lake Victoria is 3,726 feet above sea level.

† The Geographical Journal, July 1920.

of Lake Tanganyika, and the northern and north-eastern shores of Lake Nyasa. Situated on a line running through the centre of the country are Lakes Natron, Manyara and Eyasi and Rukwa.

The country is well watered and the river system may be divided into the rivers which flow (1) to the Indian Ocean, (2) to the great lakes. The principal rivers draining the plateau and flowing into the Indian Ocean are (from north to south) the Pangani or Ruvu, which rises in the snows of Kilimanjaro, the Wami, the Kingani, the Rufiji, which is navigable by small steamers for about 60 miles from its mouth, whilst one of its tributaries, the Ulanga, is navigable almost throughout its whole course, the Mandandu, the Mbemkuru, the Lukuledi, and the Rovuma, which is 500 miles long and has its source in the mountains east of Lake Nyasa. Of the rivers which feed the great lakes the more important are the Mori, Mara and Kagera (Victoria Nyanza), the Mlagarasi or Kasagwe (Tanganyika), the Songwe and Ruhuhu (Nyasa), and the Songwe or Rukwa and the Saisi (Rukwa). The Kagera, which is 400 miles long, forms the headwater of the Nile, and is navigable for 70 miles from its mouth.

(d) **Seaports.**—The chief seaports are, from north to south, Tanga with a population of 16,400, Pangani (2,200), Bagamoyo (5,200), Dar-es-Salaam, the seat of the Government (20,000), Kilwa (2,200), and Lindi (4,300).

The townships, especially those at the coast, are remarkably well laid out and picturesque: they are capable, too, of extension on their original lines without encroachment on the broad streets, avenues, gardens and open spaces.

The two most important seaports are Dar-es-Salaam and Tanga. Both have good, well-protected harbours of moderate size.

Dar-es-Salaam (the "Harbour of Peace") is a modern town. It was founded by Seyid Majid bin Said, Sultan of Zanzibar, in 1862, but it was deserted on his death in 1870, and it was not till 1887 that it was occupied by the Germans, who established a factory there. It became the seat of the Government in 1891.

Tanga is built on a plateau above the harbour, and is prettily situated among coco-nut palms and mango trees. Before the War, when the plantations in Usambara were in full working order, the export trade from Tanga was more than double that of Dar-es-Salaam.

Pangani is an ancient town, some 30 miles south of Tanga, situate at the mouth of the river of the same name. For some years after the German occupation it remained the stronghold of the Arabs. The Pangani River is lined for some miles with plantations of sugar cane, which grows in great luxuriance. A sugar factory was erected there by the Germans in 1900, but was never a success.

Bagamoyo, once a large and flourishing town, and the first headquarters of the German administration, has greatly declined in importance since the construction of the Central Railway. It will, however, always be a trade centre, owing partly to its proximity to Zanzibar and partly to the fact that dhows are able to cross the channel separating these two towns at all times of the year.

Kilwa-Kivinje (Kilwa-of-the-Casuarina-trees), as opposed to Kilwa-Kisiwani (Kilwa-on-the-island), lies at the bottom of a broad, shallow bay, backed by high rolling ground. The mangrove-belted sea ebbs about a mile and flows right up to the buildings. According to Burton (Zanzibar: City, Island and Coast), Kilwa-Kivinje was founded about 1830, when the inhabitants of Kilwa-Kisiwani migrated there in order to avoid the British gun-boats cruising in these waters and thus better to carry on the slave trade.

Kilwa-Kisiwani (the Quiloa of the Portuguese, which, with Mombasa and Malindi, is mentioned in *Paradise Lost*), lies 25 miles to the south of Kilwa-Kivinje. It is a straggling little town built on an island, a low, flat breakwater of sand and coralline, about 5 miles in length, which defends a fine deep harbour, land-locked on both sides. Of this town more anon (p. 23).

Lindi has a good harbour, into which flows the Lukuledi River, navigable for ten miles.

South of Lindi, near the Portuguese border, is the small town of Mikindani, which is situated on a large bay protected by coral reefs.

(e) **Inland Towns.**—The most important inland town is Tabora, which has a population of 25,000, and is situated at the junction of the main caravan routes from the coast to Tanganyika, and from Victoria Nyanza to Nyasa. Other important inland towns are, in the north, Moshi and Arusha; in the central area, Morogoro, Kilosa, and Dodoma; and in the south, Iringa, Mahenge, Liwale, and Songea. On the great lakes the chief towns are Mwanza and Bukoba on Victoria Nyanza; Kigoma, the terminus of the Central Railway, Ujiji and Kasanga (formerly Bismarckburg) on Tanganyika; and Mwaya, Tukuyu, and Manda (formerly Langenburg and Wiedhafen) on Nyasa.

(f) **Climate.**—The climate of Tanganyika Territory is determined by its position between 1° and 12° S. latitude, and its position relatively to the Indian Ocean. Generally speaking, the rainfall is low for a tropical country, and varies considerably from year to year. In some years there are great droughts. Three types of climate are to be distinguished: (1) the Indian or trade-wind type which prevails over the greater part of the territory; (2) the monsoon type which prevails in the N.E.; (3) the equatorial type which prevails in the N.W.

(1) The first type of climate is influenced primarily by the S.E. trade winds. It has only one rainy season in the year, and its hottest period is at the end of November, immediately before the

beginning of the rainy season. The coolest and driest period of the year is from June to August, when the S.E. trade winds blow. Thereafter it becomes increasingly warmer until the rainy season, which lasts from December till April, with the heaviest rainfall from December to February. The winds during the rainy season are light, and vary from N.E. to S.

Usagara, Ugogo, South Unyamwezi (including Tabora), and all the country south to the Portuguese and Rhodesian borders, are under the influence of the Indian or trade-wind type of climate.

(2) The monsoon type of climate has two rainy seasons. The S.E. trade wind prevails to a great extent from June to September, but turns gradually to S. and passes into the S.W. monsoon. This period of S.E. to S.W. winds is the cool and dry season. In the mountainous parts there is generally a third or little rainy season in July.

After the southern winter the N.E. monsoon gradually prevails. There is an interval of varying and gentle winds which give rise to the lesser rainy season at the end of October or in November. When the N.E. monsoon establishes itself there follows the driest and warmest period of the year (December to February).

During the interval of uncertain winds between the departure of the N.E. monsoon and the return of the S.E. to S.W. winds, which prevail between June and September, there is the great rainy season from March to May, with a copious rainfall. The hottest month is February, just before the beginning of the great rainy season.

This type of climate prevails in the N.E. and is bounded by a line running from the mouth of the Rufiji right through the Territory to the N.W., including the countries of Uluguru and Unguu, together with most of the smaller northern lakes except Lake Eyasi.

(3) The equatorial type of climate is distinguished from the other two in that it has two warmer and two cooler seasons, with two rainy seasons separated by a short abatement of the rains. The two warmer periods are October and February-March, the two cooler, July and November-December, *i.e.*, the warmer periods are when the sun is over the Equator, the cooler when it is at its farthest north and south. The difference in warmth of the coolest and warmest months is slight. In Ujiji, for instance, with an average yearly temperature of 75° F., the seasonal range is only about 4.5° F.

Easterly winds prevail in this area. From May to August the S.E. trade wind blows hard and the dry season lasts from May to September (Victoria Nyanza) or even October (Tanganyika). The rainy season is from October to May (Victoria Nyanza) or November to April (Tanganyika). There is a short abatement in the middle of the rainy season about January, which divides it into two parts. The influence of the N.E. monsoon does not extend so far inland, and the type of climate is affected considerably by the local winds in the basins of the great lakes, and by calms.

This N.W. region is bounded roughly by a line drawn from S. of Ujiji to the S. end of Lake Manyara, and from there due N. It includes the country W. of Victoria Nyanza and Victoria Nyanza itself, together with the large districts of Usukuma, North Unyamwezi and Uha, and the country round Lake Tanganyika as far S. as Ujiji.

The height above sea-level with its different effects on the sea-winds gives rise to a considerable variety of climates, but as the local climates, which differ considerably from the three main types, are restricted to relatively small regions, they do not seriously affect the general description.

The sun is dangerous on the coast, even when there is a cool breeze, but on the high ground inland a double Terai hat is sufficient protection. Frosts occur at the higher altitudes and the cold nights necessitate warm blankets.

(g) **Earthquakes.**—The information regarding earthquakes shows that the districts where these are most frequent are Usambara and Ufiome in the north and the Livingstone Mountains in the south-west. Since systematic observations were made by the Germans the chief activity in Usambara was in 1911, and in the Livingstone Mountains in 1909; the number of days on which earthquakes were registered were 15 and 26 respectively.

During May and June, 1919, very severe seismic disturbances were experienced in the south-western portion of the Territory, which wrecked the Government station and several mission buildings in the Rungwe (former Langenburg) District and caused much damage at Songea. The first shock, on May 1st, was felt as far north as Iringa and as far south as Fort Johnston in Nyasaland. At Tukuyu (formerly New Langenburg) the shocks occurred almost hourly till the end of the month, and at Songea 72 separate shocks were recorded. They appeared to emanate from the Livingstone Mountains and to travel in a north-easterly or north-westerly direction. All earth tremors were accompanied by heavy rumblings, whilst rumblings were frequently heard though no shock was felt. A fall of a side of a mountain took place behind Old Langenburg and it is estimated that some five million tons of earth and rock must have been displaced. A series of falls also occurred in the Livingstone Mountains which has quite altered the appearance of the country.

(h) **Vegetation.**—The character of the vegetation is determined (so far as climatic considerations are concerned) primarily by the rainfall and only secondarily by temperature. Hence the great variations in rainfall give to Tanganyika Territory great differences in vegetation, ranging from tropical forest to desert.

(i) **Fauna in relation to Flora.***—A country's fauna is determined for it (1) by the centres of distribution it adjoins or contains, (2) by the conditions it offers.

* Extracted from a report by Mr. C. F. M. Swynnerton, Game Warden.

Tanganyika Territory is *par excellence* the meeting place of the African distributional areas. It also offers every main type of condition, vertical or horizontal, to be found in tropical or Eastern Africa. The statement of this combination of qualifications may serve to convey some small idea of the Territory's outstanding interest from the point of view both of the working zoologist and of the preserver of wild animal life.

No less than five faunal areas fade out, or meet in, this Territory. Those of Somaliland and Mozambique are the most conspicuous, but elements of the West African forest region enter from the west, of the East Sudan and Upper Nile area (characterized by the Lelwel Hartebeest) from the north, and of the Upper Zambesi area, with peculiar rodent forms and South-West Angolan birds, from the south-east to and beyond Lake Rukwa.

The ecological divisions may be described in greater detail.

(1) *The animals associated with water.*—In the conditions that determine which amongst the animals presented to it a country will harbour, the first great division is that between land and water. Tanganyika Territory is rich in rivers and lakes, large and small, and possesses a long coast-line.

Thus, in addition to a fish-population which partakes of the characters of that of the surrounding territories, it boasts the attractive feature of a great and varied population of water-birds. Flamingoes, Ibises, Snipe (double and painted), Curlews, Sandpipers, and a most varied concourse of other Charadriiform waders, many of them migrants from the north, run on the sand or mud or wade in the shallows. With them are Herons, Egrets and Bitterns of approximately twenty species, grey, brown, white, black, buff, purple, and varying in size from the little croaking Dwarf Bittern to the great "Goliath," largest of the world's herons and swallower of two-pound fishes, and the gravely frolicsome Hammerhead that brings to its subdivided haystack nest tins, stones, and a variety of other ornaments, that are then filched from it by the native doctors of some tribes for use as charms.

Kingfishers, the black and white *Ceryle rudis* that hovers Kestrel-like above both sea and fresh water, the giant *C. maxima* that dives from a perch, and the diminutive and gem-like *Corythornis cyanostigma*, fish in our various waters with the Fishing Owl, the powerful white-headed Sea-eagle (*Haliaeetus* and its "Vulturine" relative, *Gypohierax*), Pelicans, Darters, showing only their snake-like necks when swimming, Cormorants and Gulls. Jacanas that run on the water-lily leaves, inland Terns that skim the surface of the water for insects, and Grebes, Moorhens, Geese and a dozen kinds of duck are also found on our rivers and lakes.

Monitors and, unfortunately, crocodiles are numerous—even in such a lake as Jipe, near Kilimanjaro—and are fed on by tsetses.

Hippopotami are present, as the result of their night-wandering habits, even in small and isolated crater lakes.

Water is important in other connections also. Animals generally resort to its neighbourhood in the dry season, deserting great pieces of country over which they are scattered in the rains. Buffaloes seldom remain very far from water at any time, and waterbuck and puku are even more closely connected with it. Close seasonal concentration of such tsetses as *G. pallidipes* and *G. morsitans* is usually, when it takes place, in the shady vegetation that tends to persist beside streams and swamps, and *G. palpalis*, *G. austeni* and *G. tachinoides* are found in such places at all times. Tabanid biting flies also are much tied to moist places by their breeding habits. To the Situtunga, our most water-loving buck, with hoofs elongated to prevent it from sinking in the mud, water is evidently in the main a refuge, for the depopulation of the islands of Lake Victoria has resulted, it is said, in a change in the habits of the Situtungas and a shortening of their hoofs.

(2) *The animals associated with the primary forest.*—A country's vegetation determines in the main its land animals.

The principal divisions into which our land plant-formations fall are two. They are those of the pyrophobes, intolerant of fire, and the pyrophytes, or fire-supporting plants.

Of the animals that really depend on the first it may be said that they have for long been in East Africa a disappearing fauna, but that European civilisation, with its pronounced ideas on forest-conservation, has now stepped in to save them. There is strong evidence, derived from the facts of distribution and from other sources, to show that our scanty, patchy, primary forest of to-day once covered the greater part of the country with its close stand of lofty timber trees, its multiplicity of species, its dense undergrowth of shrubs and saplings and its more or less deep shade conditions generally, its carpets of Selaginella and delicate pyrophobe grasses, its "Killer" figs and its abundant and varied more delicate epiphytes, its plank-butresses (like those of the *Piptadenia* of Unguru and Rau), its mangrove-like prop-roots (like those of the *Upaca* or Unguru), its woody, fantastic lianas, and its division into Schimper's two main types of "tropical rain forest" and (on the higher mountain slopes) "temperate" or "sub-tropical" rain forest—the former with its towering and pillar-like *Meliaceae*, *Sapotaceae* and *Ulmaceae*, the latter with its abundant Conifers, its ubiquitous "white-beard" lichen, and its flanking of giant heaths.

Several factors have been suggested to account for its disappearance—the breaking up of the old table-land, climatic changes consequent on the disappearance of former high-level lakes, the former strong development of the Kilimanjaro glacier, and the appearance of certain superficial formations—but there can be no doubt that great areas have been destroyed directly for cultivation, and the one outstanding special adaptation of the plant-formations that have replaced it—the possession by their members of a fire-resisting bark—is perhaps the strongest amongst

the lines of evidence that suggest fire as the main direct factor. Occurring perhaps ever since late Cretaceous times around the volcanically devastated areas of the Rift Valley itself, Kilimanjaro, Elgon and (earlier) Kenya, and becoming an annual event in the hands of man, fires, with the eventual aid of the agricultural tribes, have, by reducing its habitat, finally confined the so-called "West African" forest element in our animals to its present diminutive limits. These are provided by isolated forests, small or large, on the various mountain-masses and beside Lake Victoria, by still smaller surviving patches on the low-lying lands generally and by those of the narrow "fringing" forests beside our rivers that retain pyrophobe elements.

This forest fauna contains a rich butterfly element, partly shared with the non-forest formations, that is of unequalled interest from the viewpoint of the student of animal coloration. Large blue and yellow *Neophron* and polymorphic *Aterica* settle along the paths in front of one, and, closing their wings, are so invisible as to be trodden on. The forest species of *Neptis*, flying higher with a flickering distinctive flight, orange-and-white and pale blue *Leuceronias*, dainty "wood-white" *Leptosia*, disliked by birds, and still daintier striped *Cyrestis*, splendid *Euxanthe*, large mother-of-pearl *Salamis* and fritillary-like *Atella*, a few striking *Acraeines*, all but one of our fine *Danaines*, conspicuous, carelessly flaunting, evil-smelling, eaten by most vertebrate enemies only under great stress of hunger, are present, especially in the sunnier spots, and with them, their wonderful mimics, the *Pseudacraeas*, the *Euralias*, and the females of some of our fine *Papilios*, notably of *P. dardanus*, which, lemon-yellow and tailed itself, possesses a whole harem of differently coloured tail-less wives, each of which, while not resembling the male, resembles closely in colour and flight some unrelated *Danaine* or *Acraeine* butterfly, and escapes thereby, to a considerable extent, the attentions of enemies. Non-mimetic *Papilios*, including our very handsomest butterflies, abundant small brown *Satyrines*, small skippers such as *Cyclopides*, *Padraona* and *Calanorhynchus*—which dashes to hide under green leaves—*Melanitis* and *Precis*, with undersides exactly like the dry leaves amongst which they habitually settle, and such conspicuous and evil day-flying moths as *Aletis*, help to complete the throng. The *Noctuid* moths and *Mantidae* comprise some extraordinary cases of lichen-mimicry. Certain *Tabanidae* are abundant, especially *Haematopota*.

The birds of the true forest are very distinct from those outside, though to some extent they meet and mingle with the latter on the outskirts. Green Bulbuls of various species are very characteristic, and green, or green-with-grey, predominates on the upper surfaces of a number of other forest birds—Trogons, several lovely Touracos, a Barbet or two, Robins (*Tarsiger* and *Eri-thacus*), Shrikes, Warblers—rendering them hard to find when shot, and doubtless protecting them on occasions from the eye of the few hawks that habitually frequent this type of forest—as the daring Gos-hawk (*Astur tachiro*). The breast on the other hand is sometimes most brilliantly coloured, as in the Trogons, the green-backed Bush-shrikes and the Robins. The essentially pro-

tective upper side is in harmony with the fact that in this type of forest coloration is of no great recognition value at a distance.

In the forest, as outside it, "driving" the vegetation, is found the "mixed bird-party," to form which numerous species unite, and the object of which is that its component members may play into each other's bills in the matter of the insects flushed. The "leader" of the forest parties in the forest-Drongo, *Dicrurus ludwigi*, who, protected by distastefulness and conspicuously blue-black, boldly attacks the enemies of his protégés and repays himself by taking the insects flushed by the latter. Other members of the party are the insectivorous forest Weavers (*Malimbus*), various green and "bristle-necked" Bulbuls, Flycatchers of various genera, the Bush-shrikes already referred to, the Grey Cuckoo-shrike, forest Sunbirds (*Cyanomitra*), Warblers (as *Apalis*, *Hylia*, *Euprinoides*), White-eyes and Woodpeckers. Amongst characteristic forest species not yet mentioned are the Tambourine and "Cinnamon" doves, *Tympanistria* and *Haplopeia*, Delagorgue's and the "Olive" Pigeons, the last a particularly fine bird, one or two forest Francolins (as *Schuetti* of Kilimanjaro, Meru and Bukoba), the curious "Broad-bill" *Smithornis*, the long-tailed Cuckoo *Cercococcyx* and Grey Parrot (both near Bukoba), some spotted and other Barbets, Pittas, grotesque-looking, noisy Trumpeter Hornbills, and, going in flocks from place to place with the local ripening of fruits, Glossy and Chestnut-winged starlings. Plaintain-eaters of the genera *Musophaga* and *Corythæola* occur in the Bukoba country.

Distinctive mammals of this plant-formation are certain species of squirrels and of the Simian genera *Cercopithecus*, *Cercocebus* and *Colobus*, the handsomest of the latter being that of Kilimanjaro; the Tree Hyraxes; Harvey's and Abbott's Duikers, the first red and described from the Kahe forest, the second from Kilimanjaro and Usambara, black with a red crest, thick-set and remarkable for its size; the great Forest Hog (*Hylochærus*); and, uncertain of occurrence here though becoming plentiful in Kenya with its recovery from the rinderpest, the Bongo. Leopards, elephants, rhinoceroses, bush-pigs, sunis and blue duikers live in the forests or visit them, but are not peculiar to them. The Gorilla and Chimpanzee belong to the formation, but do not extend east of Urundi and Ruanda.

(3) *The animals of the annually-burned plant-formations.*—Passing over a buffer-formation, characterized by the meeting in it of the veld and forest fauna, by the tsetse *brevipalpis* (under appropriate condition of elevation), and (amongst trees and tall shrubs) by *Albizzia fastigiata*, *Rauwolfia*, *Haronga* and a handsome *Vernonia* that, with the varied birds that prey on them and strew the ground with bill-marked wings, attracts greatly all butterflies and diurnal moths, various fine *Hymenoptera* and certain *Diptera*, we come to the third and greatest ecological division of our animals. This is associated with the diverse secondary formations composed of pyrophytes that, aided by fire, and by other factors, have nearly everywhere supplanted the primeval forests still covering the East Coast in the days of the land connection with Madagascar, and carried with them to the

southernmost cape of the continent a fauna, including human elements, that was previously associated with North Africa and Southern Europe and Asia.

Alpine grass-land.—First should be mentioned the alpine formations of our highest mountains. On Kilimanjaro the ground for a few hundred feet above the forest zone is shown by the broken nature of the upper forest margin to have been cleared of forest by the usual process, and the natives stated to the writer that annual fires were actually lit by them till the German Government stopped them. The ground is covered with raised cushions of pyrophytic grasses with narrow channels hidden between them in a manner that makes walking, already impeded by the elevation, laborious, and these channels, coated merely with moss and lichen in the dry season, are turned with the coming of the rains into a maze of flowering plants. Low trees or shrubs, isolated or in open groves, are in places present—*Erica*, *Agauria*, *Ericinella*, *Senecio*, *Lobelia*. Lower heathers are also present, and in small damp patches grow celandines, cranes-bill, clover and sedges, that at the time of the writer's visit formed low, close sward, interrupted by higher patches of *Alchemilla*.

An interesting herd of elands is present in the alpine to sub-alpine zone of Kilimanjaro. Elephants emerge on to it or pass over, and the natives stated that a rare buffalo or hartebeest finds its way thither. A bush-pig (*P.c. dæmonis*), described by Dr. Forsyth Major for its intense blackness, but since shown to be indistinguishable in its variations from the pig of the Nairobi country, was found in this zone in a black and white form on the occasion of the visit referred to. Small rodents were taken in traps so freely as to indicate great abundance. A *Protea* (*P. kilimandsharica*) and a *Lobelia* (*L. Deckeni*) are visited by the handsome green Sunbird *Nectarinia johnstoni*, a Stone-chat (*Pratincola axillaris*) also tops the upper forest margin, whilst the White-necked Raven (*Corvultur albicollis*) and parties of the Mountain Chat (*Pinarochroa hypospodia*) are found right up to Mawenzi and the base of Kibo.

- On Mount Meru a bamboo belt intervenes between the alpine zone and the temperate rain forest. It is said to be penetrated by elephants and buffaloes, the latter especially passing through it on to the higher slopes.

Lower-elevation secondary formations.—Our chief remaining formations in the pyrophytic category, though varying immensely amongst themselves, nevertheless have that in common which enables them to support to a considerable extent the same animals—those, amongst mammals, that live in herds and need great stretches of dry-season grazing, and those, amongst animals generally, that have become adapted in a lesser or greater degree to insolation and seasonal drought affecting both water and vegetation.

Three broad woodland divisions are of real importance in relation to these animals. They are (a), the *Brachystegia* formation (Miombo) which extends northwards into our territory from north-eastern Rhodesia and Portuguese East Africa respectively, the former tongue reaching Lake Victoria and the latter mass the south of the Mahenge district with large outlying patches nearly up to Handeni. (b) A tree savannah formation that is geographically, though not edaphically, associated with *Brachystegia* throughout its range, and is also an intrusion from the south. It is dominated sometimes by *Mlama* (*Combretum*), often by *Acacia*, and more locally by *Vitex*, *Dombeya*, *Dooum* or some other tree. This formation, broken by big islands of high-lying ground, fills the gap between the *Brachystegia* masses and carries the general Rhodesian mass nearly to our northern border and the Portuguese to Pangani. These two, well-grassed, great, psilophytic formations between them have introduced and are still broadly associated with the essentially southern elements in our fauna, as the Sable Antelope and the Lichtenstein Hartebeest. (c) The third broad division, including the dry "nyika" thorn-scrub and aphyllous formations—"grasarm" of the Germans, composed practically of eremophytes, orchard-like or packed—is, on the contrary, an intrusion from the north. Descending from Somaliland it extends right across to the Nile in the latitude of Lake Rudolf, but narrows in on squeezing past the Kenya Colony highlands and, meeting the formations already referred to, finds its southern limit after crossing in places a line drawn from Dodoma to Pangani.

With the nyika-formations the northern (Somaliland) element in our fauna, with its Oryx, Gerenuks, Lesser Kudus, Dikdiks and Coke's Hartebeest, has entered and remains associated.

In each main sub-division, (a), (b) and (c), may be found open spaces or larger open plains that result from edaphic or other natural conditions or (temporarily) from cultivation, and, with the larger plains in particular, which constitute a plant-formation of their own, and, in places, are indistinguishable from true steppe through sheer absence of trees, is associated the famous phenomenon of the plains' game—the great herds of Zebra, Wildebeest and Hartebeest, mingling in the north with Gazelles and yet greater herds of Masai cattle, and here and elsewhere with elands, giraffes, and other species that occur also in the bush-country, as well as (in the plains) with a bird-fauna dominated by Ostrich, Sand-Grouse, Quails, Bustards, Coursers and Larks. The chief plains' species that are not essentially northern frequent rather specially also the *Combretum-Acacia* formation which is more open usually than the *Brachystegia*. With the closer forests of the latter have been associated more especially, in the writer's experience, sable, buffalo and elephant, though there is no hard and fast line between the formations which the last two animals will and will not visit. Several antelopes when in the woodland formations appear to

derive from their coloration a defence which they replace by watchfulness when exposed on the open steppe.

Each tree-savannah formation, (a) or (b), may also, as the result of ineffective (too early or night-burning) annual fires, become swamped by thicket. The latter may consist of the plants already present or may take the form of an invasion. It may still consist of isolated clumps or it may have rendered whole stretches of country grassless, impenetrable, unusable and tsetse-infested, and brought about a general change in their fauna. Travellers on the Central Railway may witness both the ineffective fires and, in places, their results.

Taking first the game animals, the following information gives a very rough preliminary idea of the distribution in our territory :

Buffalo is said to be scarce in Tabora, Kondoa-Irangi and Kilimatinde and only locally abundant in Songea and Rungwe, but nearly everywhere else is not merely abundant but has been increasing so strongly that, excluding the possible results of an epidemic such as is decimating it locally at present, even its removal from the schedule would probably not reduce its numbers, provided no export were permitted of the skins. Eland has made nearly as good a recovery from the effects of the original rinderpest wave. It is common in Tabora and rarer in Utete than the buffalo, but otherwise follows much the same general distribution. A third extraordinarily abundant and well-distributed animal is the common Zebra, in its Kilimanjaro and Highland forms—*boehmi* and *granti*. The Mahenge-Mohoro block, Rungwe and Mikindani are the only areas from which its presence is unreported, and Pangani stands alone amongst the remaining reporting districts in having but few Zebra.

An arc extending from Mbulu through Arusha and Moshi to Tanga touches the residential and travelling areas of the main elephant herds of the north. An isolated herd is present on Ukerewe Island, which is a game reserve. From Moshi and Tanga the line of greater abundance or of migration seems to pass southwards through the Kondoa-Irangi, Dodoma and Morogoro districts. From Mahenge and Morogoro inclusive downwards, excluding chiefly the most westerly districts in which they are more localized, elephants are extraordinarily abundant, and the herds comprise more good tuskers than are found in the north. The Black Rhinoceros on the other hand is abundant in the northern districts, becomes scarcer in Tabora, Kilimatinde and Handeni, and is present in small numbers only in Mahenge, Malinyi, Namanyere and Tunduru, apparently becoming abundant south of the Railway only at Ifakara. The distribution of hippopotamus has already been commented upon.

Roan Antelope—the *langheldi* form with darker ears, pasterns and chest-patch, first described from Tabora—finds its main patches of distribution on the west side of the country, and in some of these it is the dominant antelope. It occurs sparsely or locally in the Arusha, Kondoa-Irangi and Handeni districts, but appears to find centres of abundance east of Lake Victoria and in

the Bagamoyo and Ufia districts. Sable Antelope, apparently intermediate here between the southern form and short-horned *roosevelti*, has been referred to already. The Fringed-eared Oryx (*callotis*), first described by Thomas from Kilimanjaro, is one of our more localized antelopes, present in the drier portions of the Usambara district, Arusha, Handeni and Kondoa-Irangi and in parts of the Ugogo country, as well as on the east slope of Kilimanjaro.

The range of the Lesser Kudu has been already referred to. The Greater Kudu is said to be more or less common in the coast districts of Pangani, Bagamoyo and Lindi, and, in the south, about Tunduru, Namanyere and Newale. It is present, locally in some numbers, in a considerable area of which Kilimatinde may be taken as the centre. A few Greater Kudu are found at Kasanga, Mbeya and Ifakara. The Situtunga is reported from Kasanga, Mbeya and Namanyere, and the Uganda form (*spekei*, with red females, described from Karagwe) occurs in numbers on the islands and shores of Lake Victoria.

The bush-buck is scarce or absent in some areas, but on the whole is well distributed, finding shelter in the fringing forests of the rivers if the country generally is inhospitable, and is present in numbers in such widely separated areas as Bukoba, Meru to Usambara, parts of the coast strip, and the southern districts. The Masai bushbuck (*massaicus*, described from Kondoa-Irangi) is to be found in much of the "nyika" country, and the Uganda bushbuck (*dama*), in the western districts.

Bukoba, the country between Lakes Victoria and Natron, Tabora, Ufipa, Iringa and Rungwe are the districts which have reported the presence of the conspicuously-coloured Topi, described as *Damalis jimela* from a specimen from the south-east shore of Lake Victoria. Its range is given as west of the thirty-sixth degree of longitude, and this line, that of the Rift valley, is regarded by Heller as separating also the *kongoni* and typical forms of Coke's Hartebeest, the former, larger and lighter, occurring to its west, and the latter described originally from Usagara. Hartebeests of the genus *Alcelaphus* (Lichtensteins in the south, Coke's in the north), are distributed, often in considerable numbers, over the greater part of the country. The Uganda Lelwel Hartebeest (*insignis*) is said to occur near Bukoba.

The distribution of the Wildebeest, as reported, is irregular. It is abundant in the north and finds centres of abundance in Tabora, in the Morogoro—Ifakara—Mohoro area, and in Lindi, being present in smaller numbers in much of the intervening country. So far as is now known, the Rift valley divides the *mearnsi* form on the west from typical *albojubatus*, larger, with lighter legs and more horizontal horns.

Puku is reported as present locally in great numbers from the Mahenge district, also from one locality near Namanyere and from Lake Rukwa, and in smaller numbers from Bukoba and elsewhere round Lake Victoria.

Waterbuck tends to be present, and often numerous, wherever, north, middle or south, fair sized rivers or lakes exist.

Reedbuck is more or less abundant right across the northern border districts, also at Utete, in Tabora, and, in the south, at Namanyere, Tunduru, Kasanga, Songea, Tukuyu and Mbeya. Both Mountain Reedbuck—Chanler's, greyer than the South African race—and the Common Reedbuck (*redunca*), and, of the latter, both Ward's and the *tohi* forms, are present.

Impala is in great numbers in much of the country between the Central Railway and the northern border, in some of the extreme southern districts, and in Morogoro and a part of Iringa, in smaller numbers apparently in the remaining districts.

Grant's gazelle is abundant west of Natron (the *robertsi* form with widely-spreading horns being present) and in parts of Arusha, and is fairly common in Kondoa-Irangi and at Mpapua. Typical *granti* is found only in Ugogo, where it was discovered by Speke and Grant in 1848. Heller's *serengetæ* form is found near the coast and at Kilimanjaro. Thomson's gazelle, of the typical Kilimanjaro form, without black nose-spot, has much the same local distribution and is present in Tabora. The general distribution of the species is stated to coincide exactly with that of the Masai tribe. The extraordinary Gerenuk reaches the Usambara district from the north and occurs at any rate in parts of the Masai country generally.

Ostrich is locally abundant in the Usambara and other northern-border districts and at Kilimatinde. There are some at Singida and it is reported as rare at Namanyere. Giraffe, a reticulated form as well as the Masai form (*tippelkirchi*) (first described by Matschie from Lake Eyasi), is particularly abundant down to and within the central districts, as Tabora, Kilimatinde, Iringa, Morogoro and Bagamoyo, though more sparsely present in Kondoa-Irangi. It occurs elsewhere also, fairly abundantly, for example, at Namanyere, less freely in Bukoba and Mbeya.

The distribution of the smallest antelopes is best left nearly untouched. Kirk's dikdik is, actually, extraordinarily abundant in and about much of the dry nyika zone, apparently the *cavendishi* form mainly, but, between Kilimanjaro and the coast, the *nyikæ* form also. The Masai Steinbuck is fairly plentiful and Sunis are present in the forests of Meru and Kilimanjaro (form *kirchenpaueri*) and in the coast districts (form *deserticola*). At least two forms of Oribi, *cottoni* west of Lake Victoria and *haggardi* at the coast, occur here, and the Masailand Klipspringer (*schillingsi*) is widely spread but is perhaps excluded from the coast districts. These are occupied by the *hecki* form of the Blue Duiker. Some of the Duikers have already been mentioned.

Wart-hog and bush-pig are exceedingly abundant in most of the game districts. The latter are responsible for vast damage done annually to the native crops, and they provide much sustenance to lions and tsetse.

The African Carnivora, large and small, are only too well represented throughout the country. The Sudan race of the lion (*F.l. nyanzæ*) is recorded from Bukoba and others of our extreme western districts, the Masai lion (*F.l. massaica*), named originally from a specimen from south of Kilimanjaro, occurs elsewhere.

In addition to being generally more or less well stocked with game the country possesses several particularly fine shooting grounds, with game animals present in some cases in enormous numbers. Such are the area between Arusha and Lake Victoria, Lake Rukwa, Mahenge and a number of steppes in different parts of the country. A large proportion even of the wooded country offers a particularly pleasant form of shooting, even if less productive than shooting on the plains. New vistas open out as the sportsman wanders along and he never knows what he may stumble on next.

The German Government instituted approximately twenty Game Reserves (including special reserves). Those that have been examined by us so far are mostly of a useful nature, and the following conditions would appear to have contributed to their selection :—

- (a) the utility of retaining a game reserve beside each of the more important shooting grounds to ensure its indefinite re-stocking ;
- (b) the scientifically sound principle that every sub-fauna should have its reserve or reserves, and that the latter should comprise between them all types of conditions found in the Territory ;
- (c) the small " Refuge Reserve " for the animal with wide seasonal wanderings ;
- (d) the predominant importance from a financial view-point of giving reserve protection to the elephant ;
- (e) the reservation for purposes of recuperation of an area in which the game has become much thinned.

The *birds* of the secondary formations form a large and varied assemblage. Strongly contrasted upperside colour patterns are common, and are useful for intra-specific recognition at a distance, and the duller tones are brown rather than green. The phenomenon of the mixed hunting-party is seen here too, and the larger Drongo, *Dicrurus afer*, replaces the forest Drongo as leader. The Black-headed Bulbuls (*Pycnonotus*) replaces the Green Bulbuls, and prominent members of the parties are the Lesser Hornbills (*Lophoceros*) and the mouse-coloured Flycatchers, *Bradyornis*, in pairs, and the Helmet-Shrikes (*Sigmodus* and *Prionops*) and Babblers of the genus *Crateropus*, in parties : but a great number of species in all attach themselves to the party usually or occasionally—Warblers, Buntings, Shrikes, Cuckoo-shrikes, Woodpeckers, Orioles, insectivorous Weavers, Barbets, Tits, Sunbirds, Thrushes, Flycatchers, Wood-hoopoes. Even purely grain- or fruit-eating birds may be found with them on occasion, usually

as the nucleus round which the party is forming for the sake of the insects flushed by them.

Very distinctive of our pyrophyte formations are the great numbers of grain-eating birds they support, usually in flocks—Canaries, Seed-eaters, Buntings, Weavers, and little Waxbills, Bishop-birds and Whydahs in great variety and with bright yellow, black, crimson, scarlet or blue predominating in their plumage. Guinea-fowls (including the pretty curly-crested species, *Guttera pucherani*, found also in true forest, and the ugly but gloriously blue Vulturine of the nyika-formation), Francolins of nearly 20 species, including the fine Spur-fowls (*Pternistes*), Quails, six or seven Turtle-doves, Emerald-spotted and Namaqua Doves. Vultures and a great variety of hawks and eagles, including the beautiful, short-tailed Bateleur, with its masterly flight, also find their proper place in these formations as a result of the range of vision afforded. Grass-warblers are another strong group; and Sunbirds are present in far greater variety and more brilliant coloration than in the sombre surroundings of the forest, and may be seen extracting the nectar from a great variety of flowers, piercing some and duly pollinating others. Larks, Pipits and Wagtails find scope to run about, the "cut-throat" Pipits, with black chest-bar and red or yellow throat, being the largest and most conspicuous of these; Ox-peckers that attend rhinoceros and other game and cattle, and warn the former; the White-chested Crow; the true Butcher-birds of the genus *Lanius*; many Swallows and Nightjars, including the wonderful "Standard-winged" *Cosmetornis*; the true Hoopoe; many splendidly-coloured Bee-eaters and Rollers, and the Kingfishers that live on insects; most Cuckoos (including the gem-like Golden and Emerald Cuckoos, and the large Bush-cuckoos, *Centropus*, that make their own nests); most of the Honey-guides; and our two great snake killers—the Secretary bird and the huge Ground-Hornbill with its drum-like call—all belong to the secondary formations.

Some birds belong to all of them, others tend to be confined to one. Thus, the Namaqua Dove and the White-headed Shrike (*Eurocephalus*) are particularly associated with the Nyika dry-scrub country—but the subject cannot be gone into more fully here. It is wonderful, actually, how full of birds the above-mentioned formation is even at its driest, when it extends away as a completely leafless, soft grey waste, flushed widely here and there with the scarlet pink flowers of two trailing shrubs; also how well conditioned they are and full of insects.

Amongst butterflies the *Acrainæ*, mostly red-brown with black spots, dominate, and *Pierinæ*, of the genera *Teracolus*, *Belenois*, *Catopsilia* and *Terias*, the first including the various orange, scarlet and purple-tips, and the last several small brilliant-yellow species, are very abundant. The spotted "Guinea-fowl" butterfly *Hamanumida*, and species of *Byblia* and *Precis*, the last with the marvellous seasonal colour-changes, are common, and another very abundant and conspicuous butterfly is *Danaida chrysippus*, chestnut with white fore-wing bar and a famous model for mimicry. Black and white *Papilio angolanus*, the fine

“Orange-dog” butterfly (*P. demodocus*), and some further species replace the more striking Papilionine forms of the forest, and join the little “Blues” and several of the genera already enumerated in forming the great butterfly assemblages that are found drinking together in moist places, each colour tending to form separate little groups of its own.

Large muscle-filled species of *Charaxes* in great variety, not easy of capture, even by bee-eaters, and affording smaller birds such difficulty in the matter of their reduction to a swallowable condition as to have given rise to mimicry, resembles the various starlings in being found wherever, in bush veld or forest, fruit is ripe. Robber-flies (*Asilidæ*) are specially characteristic of the formations we are discussing, and may be seen carrying their victims—grass-hoppers, bees, butterflies, each other. Ground-running beetles—*Cicindelidæ*, *Carabidæ*, *Tenebrionidæ*—appear in numbers early in the rains, and our two commonest tsetse—*morsitans* and *pallidipes*—are specially associated with the savannah formations, above all with the *Brachystegia*. *G. brevipalpis* is found in their shadier parts, and in general it may be said that the more nearly the secondary formations reproduce the conditions of the primary forest, the more they tend to attract elements of the latter’s fauna.

Problems connected with the Fauna.—The outstanding economic problems connected with the fauna are (1) Tsetse-control—for fly is at present impeding the development of a large proportion of the entire country; (2), not less important from the native view-point, the control of vermin—of the carnivora which are taking a heavy toll of human life and live-stock in certain districts—and, a more universal and difficult trouble, of the various garden-raiding animals. Both these problems are being taken in hand, in addition to faunal preservations and the beginnings of a general faunal survey. In the last connection much aid will doubtless be derived from the work already done by the Germans, and results of systematic and economic importance may be expected, but the presence of important fossiliferous beds, together with the present limitation of appreciable material bearing on the evolution of our mammals to the northern and southern ends of the African continent, renders it possible that it will be the palæontologist who will carry off the palm here for interesting scientific discovery.

(j) **Fossils.**—A large find of fossil remains was made by the Germans in the Tendaguru Hills, situated on the right bank of the Mbemkuru river, in the Lindi District, about the year 1905, and a scientific expedition was equipped and despatched to the spot in 1909. Specimens of considerable interest were unearthed, including the remains of an enormous type of Dinosaur, which is said to be of far larger dimensions than the *Diplodocus* found in America. The neck of the former, for instance, is 12 metres in length, of the latter only 7; and the shoulder blade is 2 metres long, as against 1.

Since our occupation of the country further discoveries of fossil remains have been made in other parts of the Lindi District, and

the British Museum is contemplating sending out an expert to investigate the deposits.

Other similar discoveries were made by the Germans in the Arusha, Mahenge and Kondoa-Irangi districts in 1914, but although excavation was commenced, the work had to be abandoned owing to the War.

II.—HISTORY AND ETHNOGRAPHY.

(a) **History.**—There has existed on the coast of East Africa an ancient civilisation from very early times. It is known that the natives of East Africa had trade connections with Arabia and India before the beginning of the Christian era, and that there was a regular migration of Himyarites from South Arabia to South Africa, who worked gold mines, and possibly built Zimbabwe and other ruins in Rhodesia. It is also probable that such localities as the Lamu Archipelago, Mombasa, Tanga, Pangani, Dar-es-Salaam and Kilwa, which offer obvious advantages as ports, were repeatedly occupied before the oldest civilisation of which there is any record.

The Greek geographer Ptolemy (about A.D. 150) gives some account of East Africa as then known. He calls the country Azania and speaks of the promontory of Zingis. An earlier description of the East African littoral is to be found in the Periplus of the Erythraean Sea, where reference is made to the island of Menouthias and to a town called Rhapta. The former was either Zanzibar or Pemba; the latter is thought to be either Pangani or a town in the delta of the Rufiji River.

Active colonization by Arabs from Oman appears to have begun in the 8th century A.D., as a result of the spread of Islam, but it is possible that settlers arrived from both Arabia and Persia some three centuries earlier, though there is no detailed information respecting this movement. Whether the Arabs were preceded or followed by the Persians is uncertain, but the presence of true Persians on the East African Coast has been established by the discovery of Persian inscriptions and coins and of ruins of Persian architecture.

There is a fair amount of tradition, if not of accurate detail, respecting the colonization of the coast in the tenth and following centuries of the Christian era; but the history of this period is for the most part a record of complicated quarrels neither easy nor interesting to recount.

The oldest known town in Tanganyika Territory is Kilwa-Kisiwani (Kilwa-on-the-island), the Arabic chronicles of which were published in the Journal of the Royal Asiatic Society for 1895 (another version can be found in Barros, *Da Asia*, Lisbon, 1778). This Persian town was founded—probably upon a far older site—by a son of the King of Shiraz about the year 975 A.D.; and the ruins of two mosques, which, according to tradition, were built at the end of the 12th century, are still visible.

The Arabian and Persian colonies in East Africa are said to have reached the height of their prosperity between 1100 and

1300 A.D. That the towns enjoyed a considerable degree of prosperity and civilization is recorded by Ibn Batuta, the Arabic geographer, who visited Mogdishu, Mombasa and Kilwa in 1328.

It is perhaps of interest to mention that the Chinese, attracted by the ivory, gold, tortoise-shell, ambergris, and slaves exported from these shores, despatched fleets on several occasions to East Africa, the last known visit occurring in 1430. Chinese coins dating between A.D. 713 and 1201 have been found at Kilwa and Mogdishu.

The authentic history of East Africa can be said to commence when in 1498 the first Portuguese expedition under Vasco da Gama sailed along this coast on its way to India. The Portuguese found on the arrival a series of independent towns, peopled by Arabs, but not united to Arabia by any political tie. Their relations with these Arabs were mostly hostile, but during the 16th century they firmly established their power and ruled with the aid of tributary Arab sultans.

Towards the end of the 16th century two new, though only transitory, powers made their appearance and played their part in harrying the coast towns—the Turks and the Zimbās. A Turkish corsair in 1585 ejected the Portuguese from most of their settlements, but was eventually defeated by the Portuguese, who allied themselves to the Zimbās, a tribe of Zulus from south of the Zambesi. After the defeat of the Turks, the Portuguese, with the aid of the tribe of Segeju, proceeded to make war on the Zimbās, whom they entirely overthrew.

The Portuguese rule, however, rested always on rather weak foundations, and the Arabs of Oman and Muskat succeeded in throwing them out of Oman in 1650, and proceeded to attack them in Africa. Between 1660 and 1700 there was much warfare and burning of towns, but the advantage remained with the Arabs, who captured Mombasa in 1698, after a siege lasting 33 months, and then occupied Pemba, Zanzibar, and Kilwa, driving the Portuguese out of practically all their East African possessions except Mozambique. This marks the real downfall of the Portuguese power north of Mozambique, but it was reasserted from 1727 to 1729, when they were driven out for the last time, and a fleet despatched by the Viceroy of India to their assistance was destroyed by a hurricane.*

The traces of the Portuguese occupation of the East African coast are very small, and consist mainly of a few buildings and the presence of numerous Goans whom the long-standing connexion with Goa has brought over to Zanzibar and the mainland. There is no proof whatever that they penetrated inland, though they had heard of Kilimanjaro, and they appear to have merely held a series of ports to facilitate their voyages to India.

Except the Portuguese attempt at reoccupation mentioned above, little of moment occurred on the coast of East Africa

* Strandes : Die Portugiesenzeit von Ostafrika.

during the 18th century. The tie which connected the East African colonies with the distant Court of Muscat was a weak one, and the supremacy of the Imam of Oman, as his name implied, was mainly spiritual. The allegiance to Muscat became more and more shadowy till about 1740 when the Mazrui Governor of Mombasa and the Nabahan King of Pate declared themselves independent and proceeded to fight with one another for the supremacy of the Coast. This declaration of independence was probably connected with a revolution in Oman when the Yorubi were replaced as the ruling family by the Bu Saidi, from whom the present Sultans of Zanzibar are descended. For nearly 100 years the Bu Saidi did not trouble much more than the Yorubi had done about their African possessions until Said bin Sultan, the fifth of the line, transferred his capital in 1832 from Muscat to Zanzibar, which until then had played a comparatively small part in the history of the coast.

Seyid Said bin Sultan conceived the idea of making a chain of trading stations extending from the coast to the Congo and to the Nile. Bagamoyo, Saadani or Fangani were the usual points of departure, and Tabora the most important inland centre. This second period of Arab domination was the great period of the slave trade. The Arabs made no attempt to introduce Mohammedanism or conquer the countries of the interior, but merely deported the inhabitants to the coast or elsewhere. As a result the Congo Free State was founded to protect the country and the natives from these eastern raiders.

After Seyid Said's death in 1856 his territories were divided between his two elder sons, and Zanzibar became an independent Sultanate. From this period until the partition of Africa between the European powers began in the eighties, few political events of importance occurred in East Africa.

(b) **European Discovery.**—The interior of Tanganyika Territory was discovered principally by Englishmen and Germans. Among these may be mentioned Rebmann, Krapf, Burton, Speke, Grant, Cameron, Thomson, von der Decken, Livingstone and Stanley. It was at Ujiji on Lake Tanganyika that the two last mentioned had their celebrated meeting, and the house that Stanley occupied near Tabora is still standing. After the German occupation the country was in many places carefully explored by Germans, among whom may be mentioned Wissmann, von Goetzen, Bornhardt, Fülleborn, Meyer, Baumann and Stuhlmann.

(c) **The German Occupation.**—German East Africa, the most important of the German Protectorates, came under German influence through the individual initiative of Dr. Karl Peters.

In 1884, Peters, with three companions, made a journey to the interior, and in six weeks concluded twelve treaties with native chiefs, the territory of these chiefs being then declared by the explorers to be German territory. Peters returned to Berlin, and

in 1885 the newly acquired land was placed under the Imperial Government.

This arrangement was recognised by the British Government in 1886, but a ten-mile belt along the littoral was still held to belong to Zanzibar.

Two years later Germany acquired the right of collecting customs duties on the coast, and in 1890 took over the coast strip on payment of £200,000 to the Sultan of Zanzibar.

The development and pacification of the Protectorate in its early days was largely due to the energy and enterprise of Major Wissmann, who organized the troops raised in 1889 to quell the Arab rising, launched the first steamer on Lake Nyasa, and took part in the suppression of many of the native insurrections which signalized the bringing of the country under European rule.

From 1891 to 1893 the Germans were engaged in war with the Hehe, a warlike people of the plateau region south of the Rufiji River, and a certain number of small punitive expeditions took place every year till the serious rebellion in the southern districts of the colony between Lake Nyasa and the Kilwa coast occurred in 1905. Nearly all the tribes, Mohammedan and Pagan, took part in it, and officials, missionaries, planters and traders were murdered, as the Germans were taken completely by surprise. Some 120,000 natives (adults and children) are said to have died during the struggle, or from its immediate results. The period following the conclusion of the rebellion was one of even greater suffering for the natives than that of actual hostilities, as the military authorities seized all available food supplies, either for feeding the German force or for purposes of denying them to the enemy.

During the latter years of the German Administration the country was to outward appearances comparatively peaceful. The natives had for some time past been gradually losing their warlike habits; the number of white settlers, and the German control, grew year by year; and after the terrible lesson of 1905-6 when they either suffered from, or had an opportunity of witnessing, the German policy of "frightfulness," the natives were unlikely to repeat the experiment of rebelling unless in very exceptional circumstances.

(d) **Ethnography.***—The aboriginal inhabitants of Central Africa are thought to have been a dwarf-like people, whose scattered descendants are to be found amongst the Bushmen of the Kalahari desert, the pygmies of the Semliki forest and Ruanda, and the helot races living with some of the Hamitic tribes, such as the Wata among the Galas, the Tomal, Yebir, and Midgan amongst the Somalis, and the Mindsho in Kaffa.†

A negro race—a black-skinned woolly-haired, prognathous people, speaking a monosyllabic language—are believed to have

* Reference has been made to Dr. Stuhlmann's *Handwerk und Industrie in Ostafrika*.

† Professor Hans Meyer in his book *Ostafrika* (1914) states that the Kindiga or Tingida, who are to be found in small numbers to the east, and the Nege and Wasi to the west, of Lake Eyasi, in Tanganyika Territory, as well as the Sandawe, near Kondoa-Irangi, are possibly descendants of the autochthonous inhabitants of the country.

migrated from southern Asia about the commencement of the pluvial age and over-ran north and east central Africa. It is probable that they were armed with bows and arrows, had wooden implements, and brought with them the banana and the colacasia.* It is also probable that these people, whose descendants are the negroes living in the Sudan from the Upper Nile to the Atlantic, were acquainted with and introduced the drum-signals, secret societies and mask dances, which are met with in West Africa at the present day. So far as is known, there are only a couple of isolated tribes representing the Sudanic negroes in Tanganyika Territory, the Mbugu in the Usambara Hills, and the Gaya, near Shirati on Lake Victoria; but ethnographical remains of them have survived amongst the Zaramo behind Dar-es-Salaam, and in the Uluguru Hills.

In the wake of the negroes from south Asia came the Proto-Hamites also from Asia, but from a more northerly and westerly direction. They were a people whose language was probably agglutinative, that is to say, the syntax was formed by adding prefixes and suffixes to the root. It comprised numerous noun classes, and was generally of a more advanced character than the monosyllabic tongue of the negroes. The Proto-Hamites brought with them the goat and the dog, and they introduced sorghum and other grains. These people mixed with the negroes and produced the earlier Bantu races, which are represented in Tanganyika Territory by the Nyamwezi (with sub-divisions Sukuma, Sumbwa, Winsa, Fipa, Konongo and Kimbu, &c.), and by the Sangu, Hehe, Bena, Kinga, Matengo, Nindi, Makonde, Mwera, Ngindo, Sagara, Zaramo, Zigua, Shambaa and others. Unlike the word negro, the name Bantu refers primarily to language, not to physique, and the most interesting point about these people is the distribution of their language over a vast area reaching from Cape Colony to Kenya and the Cameroons. Whereas the negroes do not form a unit linguistically, but speak the most diverse tongues, which are probably to be numbered by hundreds, the Bantu languages all belong to one family, and exhibit less difference than do the various Aryan languages among themselves.†

Following on the Proto-Hamites the light-coloured Hamites migrated to Africa in the course of untold ages, some via Suez and others via Bab-el-Mandeb, the first of these migrations being at least 7,000 years ago. The name Hamite is primarily applied to the group of languages of which ancient Egyptian is the most conspicuous representative, and which are notable for the inclusion of a grammatical gender and an article. The majority of these wanderers, who generally preferred a semi-nomadic life and cattle-herding to a settled existence in towns and agriculture, spread along North Africa, whilst others pressed South, one group going to the extreme end of the continent, and, mixing with the Bushmen pygmies, formed the Hottentots. Other

* *Colacasia* is a genus of *Araceae* and includes plants with edible roots, e.g., the *Arum* and *Caladium*.

† Professor Meinhof has distinguished 264 negro or Sudanic languages and 114 dialects, and 182 Bantu languages and 119 dialects. Sir H. Johnston has illustrated 276 Bantu languages and dialects.

groups inter-married with the earlier settlers, their descendants being now known as the Younger Bantus and the Central Bantus. The most notable of the former in the Tanganyika Territory are the Chaga of Kilimanjaro, the Arusha, Pare, Digo, Kaguru, Gogo, Nyaturu, Irangi, Iramba and Mbugwe; and of the latter, who have a considerable admixture of Nilotic or negro blood, are the Shashi, Zoba and Ruri, inhabiting the south-eastern shores of Victoria Nyanza, and the Ha, Suwi, Sinza and Siba, &c., stretching from Ujiji to Bukoba. Others again, who are less mixed with the former inhabitants, are the tribes allied to the Nandi of Kenya Colony, represented in Tanganyika by the Dorobo, Tatoga, Mbulu, Fiome, Burunge, Ngomvia, &c., inhabiting mostly the barren Rift Valley*; the royal and superior caste of the Hima or Huma and the Tusi, living on or near the western shores of Victoria Nyanza, whose features present a distinct physical type resembling the faces seen on ancient Egyptian monuments; and the Masai, who were pushed south by the Nilotic tribes, and migrated from their home between Lake Rudolph and the Nile to Kenya Colony and Tanganyika Territory a couple of centuries ago.

The early Hamites introduced into Africa the ox and the fat-tailed sheep; they mostly had bee-hive shaped huts; they possessed spears and shields, and they used hides as coverings.

Whilst during the last century the Masai were pushing south, sweeping all before them as far as Ugogo and Usagara, the Zulu peoples from south of the Zambesi (who in the 16th century had burnt and sacked most of the towns on the East African coast to Mombasa, where they were defeated by the Portuguese)† penetrated into, and occupied portions of, what is now Tanganyika Territory. Like the Masai, the Zulu tribes were cattle rearers, but they were also slave hunters. They plundered the area north of the Rovuma; they conquered and settled in the country east of Lake Nyasa as far as Mahenge; and they penetrated right up to Victoria Nyanza, where a small group of them, known as the Tuta, live in the Sumbwa country to the present day. The Masai and Zulus never came to close grips owing to German intervention. It is perhaps of interest to note that some Bantu tribes in the north, impressed by the successes of the Masai, adopted their weapons and customs, whilst some of those in the south aped the Zulus and, armed with assegais, plundered their neighbours.

A peaceful migration, which has been taking place for some years, is that of the Bantu Yao and Makua, who are crossing from Portuguese East Africa to Tanganyika Territory, and settling among the Donde and Makonde on the north bank of

* Manuscript vocabularies of six Hamitic tribes inhabiting the Great Rift Valley, which were compiled by Dr. M. Heepe in 1914-15, have recently been found and returned to their owner. It is hoped that when these vocabularies are published much light will be thrown on the origin of these people.

† See page 24. The Zulu tribes, particularly the Angoni, were known to the East African natives as Wagwangwara, "the dreaded ones."

the Rovuma River. A similar migration—but on a much smaller scale—has also occurred in the north of the Territory, a few Kamba, Taita and Nyika having left their homes in Kenya Colony and settled amongst various tribes in Tanganyika. The largest of these colonies is near Dar-es-Salaam, some Kamba having wandered as far south as this during a famine.

The most important people on the coast are the Swahili, who are hybrids between Arabs or Persians and all sorts of African blood. Living as they do on a long narrow strip of coast and in scattered archipelagoes the Swahili had no chance of attaining any sort of political union, even had they desired it, but they have exercised a widespread influence, chiefly through their language. In point of wide distribution and utility over a large area Swahili may fairly claim to be one of the great languages of the world, and it possesses a remarkable vitality and power of advancing at the expense of other languages. It is more or less spoken as a *lingua franca* from Aden in the north to Durban in the south, and from the Indian Ocean to the waters of the Nile and the Congo. It is perhaps more widely known in Tanganyika Territory than in the neighbouring Colony and Protectorates, and there is probably no town or village in the whole country where the language is not understood. In religion the Swahili are Mohammedans, and they have a pride in genealogy and some taste for literature, both derived from the Arabs. Their literature consists of poems and stories, of little interest except as indications of the mental culture of the writers, and also in a few instances of chronicles of various cities, some of which have been published.

The most important tribes in the interior are the Nyamwezi and the Hehe. The Nyamwezi are a large tribe or group of tribes, who for many years furnished tens of thousands of porters for the caravans proceeding into the interior, and who in more recent times have provided the best labourers for the construction of railways and roads, and for the establishment and maintenance of Government stations and plantations. The Hehe were a thorn in the side of the Germans for many years. They were eventually crushed, but their Sultan, Mkwawa, refused to surrender and shot himself. The return to his people of his head, which there was reason to believe had been sent to Berlin, was included in the terms of peace after the great European War, but the Germans have not been able to discover where the head was deposited.

(e) **Religions.**—The natives of Tanganyika Territory have very few religious observances. It is, of course, not true that they have no religion at all, as is sometimes stated, but it is a fact that, whereas in the kingdoms which make up the Uganda Protectorate there were in pagan times temples, priests and sacrifices of the usual African type, all these external signs of religion seem to be wanting in Tanganyika. Mohammedanism is professed in the coast towns but it has never penetrated very far

inland except in Usagara, Uzigua and Usambara. The total number of Mohammedans is 300,000, and amongst these are included a considerable number who merely observe certain rites and whose connection with Islam is quite superficial. The German Government feared that Mohammedan influence was opposed to their interests and warned the District Officers against the danger which might result from the unrestricted dissemination of this religion. In various circulars which were issued between 1909 and 1913 attention was repeatedly called to this danger, and it was stated that since Islam is a religion with aggressive tendencies its danger lay in the fanaticism which it might arouse among the natives. As an effective means of combating Mohammedanism the German Governor, in a circular issued on October 13, 1913, recommended the encouragement of pig-breeding amongst the natives.

Two classes of religious ideas, other than Christian and Mohammedan, prevail among the inhabitants of Tanganyika Territory. One is the worship of a sky spirit, called Eng-ai (rain) among the Masai, and Asista (sun) among the tribes allied to the Nandi (Tatoga, &c.). The prayers of the Masai and kindred tribes seem to be genuine native compositions, in which the appeals to the sky god are mixed up with allusions to other heavenly bodies. Among the Masai there appears to be hardly any idea of existence after death, or of ancestor worship. Old men are buried and are believed to turn into snakes, but young people die like cattle, and their corpses are simply thrown into the jungle to be eaten by hyenas. Among the Bantu-speaking tribes a different system of religious ideas prevails, based upon ancestor worship, surviving in a very fragmentary form, but still distinctly traceable. The Bantu name for the deity, Muungu, Mngu, Mulungu, &c., seems to mean really ghosts who are deified, or at least who require to be propitiated. Among these tribes corpses are buried and offerings are made on the grave. The Bantu-speaking tribes are also cursed with a belief in witchcraft, from which the Hamitic tribes are free. This superstition is more terrible in its consequences than it sounds, for it means that every disaster, such as a death in a family, is attributed to evil magic, and when such a disaster occurs it is customary to consult a witch doctor or witch-finder, who indicates some unfortunate person, often a woman, as the culprit and recommends that he or she be put to death, a recommendation which is usually followed.

III.—ADMINISTRATION AND POPULATION.

(a) **German Administration.**—The German Imperial Chancellor was originally responsible for the administration of all the German Protectorates, but in 1907 the Colonial Office was separated from the Foreign Office and made independent.

The head of the local Government was the Governor, who was assisted by a Council which met twice a year at Dar-es-Salaam, but its functions were of an advisory nature only. Except for

the Postal and Telegraph Department, which was outside his jurisdiction, the Governor was the supreme civil and military authority, although from 1906 onwards the Protectorate troops (*Schutztruppe*) were placed under a separate commander. On the outbreak of war the Governor was Dr. Schnee, who had held the appointment since July, 1912, whilst Major (afterwards Major-General) von Lettow-Vorbeck was commandant of the Troops.

For purposes of administration the Protectorate was divided into 24 districts. Of these 19 were civil districts, 2 (Mahenge and Iringa), military districts, and 3 (Ruanda, Urundi and Bukoba), residencies. The District Commissioners (*Bezirksamt-männer*) were responsible for the maintenance of peace and good order in their districts, but only coloured people could be dealt with in their courts.

For the maintenance of justice among Europeans there were five high Courts, at Dar-es-Salaam, Tanga, Moshi, Mwanza, and Tabora, with a Supreme Court at Dar-es-Salaam. The Judge when hearing cases was assisted by four European assessors.

Corporal punishment appears to have been regarded as an important method of enforcement of the laws, for in 1911-12 5,944 official floggings were administered, whilst in 1912-13 the number was 8,057. The number of lashes usually bestowed was 25, and when a criminal was sentenced to two floggings—a frequent event—an interval of two weeks had to elapse between the floggings.

No record was kept of the unofficial floggings administered as "parental correction," but it was known that the number was a large one. In 1912-13 107 employers were convicted of assaulting their labourers, but this is no criterion of the number of cases of assault committed, for natives were punished if they brought charges against their employers which they were unable to prove, and, therefore, usually suffered in silence.

In a few rare instances, *e.g.*, in the Bukoba District, the Germans administered the tribes through their own Chiefs or Sultans, but as a general rule the tribes were organized under *Akidas* (a Swahili term meaning a commander of soldiers). This system was introduced by the Sultan of Zanzibar in the forties or fifties, and was accepted and developed by the Germans. The *Akidas* were paid native (usually Arab or Swahili) officials, each of whom had restricted magisterial jurisdiction over natives (including powers of inflicting corporal punishment), and was responsible for the collection of taxes in a prescribed area (perhaps 100 villages). The headman of one village or more is called a *Jumbe*. If the *Jumbe* was an influential man, he was directly responsible to the District Commissioner (*Bezirksamtman*) and was given the same magisterial jurisdiction over the natives of his villages as an *Akida*: otherwise he was subordinate to the *Akida*. The *Jumbe's* duties consisted chiefly in finding

labour for the Government or for European travellers. In the Coast towns were also *Liwalis*, or Arab Governors, who as a rule were nothing more than superior *Akidas*.

For the whole of German East Africa, *i.e.*, for an area of 385,000 square miles, with a population of seven-and-a-half millions, the Germans had in 1914 an administrative staff of 79 Europeans only.* With such a small staff, occupied as they were with manifold duties, one of the most important of which was to provide labour for Government Departments, for the construction of railways, and for settlers, it was obviously impossible for the native officials to be adequately supervised. This was to some extent recognised and admitted by the Germans, and the Governor, Count von Goetzen, in his report on the rebellion of 1905, remarked that, unless the European administrative staff—even smaller than in 1914—were considerably increased, many matters must of necessity be left in the hands of the *Akidas*, “who resort to oppression and fraud, which makes our Administration detested by the people.” Count von Goetzen’s successor, Freiherr von Rechenberg, likewise called attention on various occasions to the necessity of increasing the number of European officials, and “limiting, or even abolishing, the executive power of *Akidas*, whilst supporting the *Jumbes*, or hereditary chiefs.”

On our arrival in the country, it was found that in most parts of the territory the Swahili or coast influence was paramount. The more backward tribes had fallen automatically under the domination of the nominal Mohammedans, which was due partly to the fact that the average native regards the Swahili as a social superior, to be imitated as far as possible, and partly to the support given to the Swahili by the Germans, who considered that they had a civilising influence over the natives. The old tribal organisations, between natural decay, increasing intercourse and education, German punitive expeditions, and German policy, had disappeared almost entirely. Very few, if any, traces of primitive Bantu organisations exist, though many customs of obvious antiquity remain, and the social system now consists merely of a weltering mass of ignorant agricultural peasantry, to some extent controlled by somewhat more intelligent headmen who (especially the more prominent men) are usually alien in race and ideas to the tribe they govern.

An accurate description of the German system of rule as we found it on occupying the country is given in a report by Captain

* <i>Bezirksamtämner</i> (including 2 Acting officials)...	...	...	24
<i>Sekretäre</i> (including Assistants) ..	...	...	46
<i>Residenten</i> (including Assistants) ...	...	...	6
Officers in charge of three military districts	...	...	3

G. St. J. Orde-Browne, O.B.E., whose comments on the attitude of the native towards us are also worth quoting :—

“ The German system consisted of the election and vigorous support of a few powerful *Akidas*, who were assisted by numerous *Jumbes*. The *Akidas* are in almost all cases Arabs or Swahili, who are usually quite oblivious of native ideas and customs, and regard Islamic culture as the only and obvious road for any advance. They appear to consider themselves in most cases the lieutenants of a blind and ponderous Administration, which has certain concrete demands in the form of labour and tax that must be met. Beyond those, the *Akida* seems to regard himself as not expected to go ; he is to be allowed a fairly free hand to exploit the people as he pleases, and expects a wide measure of power—supported if necessary by Government bayonets—to enable him to carry out his share of the bargain. The *Jumbes* model themselves on him, and naturally follow the lines likely to please him, though in some cases they spring from the people whom they rule, and can therefore honestly claim to represent them when the truth is likely to be acceptable. After careful consideration, I must express myself as a decided opponent of the *Akida* system. To a ‘ get-rich-quick ’ Government, which takes a short-sighted view, and desires only a system that will produce the more elementary requirements, the *Akida* is a good friend ; but it is impossible to deny the fact that he is a channel of communication which is fairly certain to filter out and detain a considerable share of revenue, as well as a large amount of valuable information. I am convinced that many of the evils which brought about the perpetual punitive expeditions of German days arose solely because the white official was so shut off from direct dealings with the natives themselves. To put the position bluntly, *Akidas* save trouble. A lazy district officer will appreciate an efficient *Akida*, and therefore tend to be biased in his favour, even though unconsciously. If an *Akida* is efficient, he is dangerous ; if inefficient, he is redundant. I am persuaded that an energetic and sympathetic officer will be able to deal direct with the *Jumbes*, dispensing with the *Akida* intermediary. This view, however, does not admit of immediate enforcing ; it would be manifestly rash to break up such remnants of system as we have ; and I should prefer to reconstruct on the ruined foundations of the German system, bad though it was, rather than to attempt the impossible task of trying to create a purely native and non-Swahili authority even among the more primitive tribes. The line of development which appears to me to promise best, is the maintenance of the German system in a modified form, with the *Akidas* deprived of much of their power ; as we get more closely in touch with the people, and understand their attitude and gain their confidence, we can gradually replace the alien rulers by men more in touch with the tribes they represent ; so that in time the *Akida* will become unnecessary, and on the death or removal of those existing there will be no necessity to replace them.”

“ The attitude of the native towards us is at present a curious one. He has, I think, sufficient sense to separate measures of military necessity from those of purely administrative intention; and he appears to consider us a great improvement on the German. At the same time, while dazzled by the powers of a people who have shown such a display of unknown resources in driving out the hitherto invincible German, he is inclined to consider us kindly and easy going, and therefore people with whom liberties may well be taken. To natives who spent several years in more or less perpetual risk of shooting, hanging, or brutal flogging, on the slightest pretext, it must appear something very like weakness when their new rulers exhibit a reluctance to administer even a mild flogging. For this reason, while entirely opposed to brutality, I feel that we shall have to act with vigour and severity in cases of deliberate disobedience or lawlessness; it is bound to take some years to educate the native from his previous notions of white justice up to our milder and more reasoned methods. The question of the ex-German askari (often with a knowledge of still-concealed weapons) is also a difficult one. After years of complete licence, and an experience which has shown him that white men are, after all, people who can be successfully fought, he is bound to be a danger to the community. Occasional individual outbreaks, involving possibly the death of some Government official, would seem inevitable.”

Immediately after the Armistice it was decided that ex-German askari—both those who were under detention as prisoners of war and those who remained with General von Lettow at the time of his surrender, to a total of about 6,000—should be released upon giving an individual undertaking to remain peacefully in their villages and to refrain from any act likely to prejudice the new Administration. It is satisfactory to be able to record that they have loyally observed their pledge and that no instance has been reported of an ex-askari causing trouble or annoyance, whether directly or indirectly. They have apparently returned contentedly to the conditions of normal life, and it is not now anticipated that any danger is likely to result from the presence of these old soldiers scattered throughout the territory.

The German Government was not slow to realise that the potentialities of the country as a producer of fibre, cotton, copra, coffee, maize and other cereals, beans, potatoes, timber, cattle and sheep, hides and skins, and possibly of minerals, were very great, and did its utmost from the first to encourage and to accelerate the production of raw materials for its own needs. Land was granted in huge tracts to capitalist companies and on easy terms to small individual planters and settlers, and attempts were at the same time made to force production by natives themselves. The effect of this policy of hasty development, and the incessant demand for the labour of the native which it entailed, was to produce the great rebellion of 1905-6, to which reference has already been made. The rebellion having been ruthlessly

and brutally stamped out, and the native having been reduced to abject submission as a permanent serf, development in the latter years of German administration proceeded more rapidly than ever, until it was brought to an end by the European war.

It is clear from such records as are available, and from the trend of its latter-day legislation, that land and labour problems were forcing the German Government towards a doubt of the wisdom of their earlier policy of feverish development. The demand for labour in the more closely settled parts of the country, *e.g.*, the districts of Tanga, Pangani, Wilhelmstal, Moshi and Arusha, was far in excess of the local supply, the more so as natives of certain tribes, such as the Masai and the Arusha, are unsuitable as labourers in any capacity, while others, such as the Chaga of Kilimanjaro and the hill-dwellers of Pare, at once fall sick and become useless if brought down to the climate of the plains. Recourse was therefore had to the importation of labour from the districts of the interior, particularly the Nyamwezi from Tabora.

Although this labour from the hinterland was nominally voluntary, it was in practice largely obtained by various methods of pressure and by the bribery of subordinate officials and of native headmen, and in many parts employers who made direct requests to the district official for a specified number of "boys" seldom went without a prompt satisfaction of their demands.

Legislation introduced ostensibly for the protection of the native labourer was honoured rather in the breach than the observance. Natives once engaged found it difficult to obtain their full wages or their discharge on completion of the stipulated period of employment, and the few who had the courage to approach the district office with complaints of ill-treatment or breach of contract too often obtained no other satisfaction than they might find in a flogging or a term of imprisonment. Yet, in spite of these conditions, the effect of which was to extract the maximum of labour from the native, employers complained that the supply was inadequate.

The general demand for labour, never fully satisfied, showed every indication of growing more insistent as development proceeded, and it was no doubt the prospect of an impossible situation ultimately arising that led the German Government to consider the question of further grants of land to settlers, and to decree finally that no more Crown land should be alienated in the district of Tanga, in the districts of Pangani and Wilhelmstal north of the Pangani River, or in the cultivated areas of the Moshi and Arusha districts, round Kilimanjaro and Meru mountains.

(b) **British Administration.**—After the unsuccessful attack on Tanga in November, 1914, no attempt was made by the British troops to occupy German East Africa till early in 1916, when Lieut.-General J. C. Smuts attacked and defeated the German forces at the foot of Kilimanjaro, and occupied Moshi on March

13th of that year. By the end of the year all the country north of the Central Railway was effectively occupied either by His Majesty's forces or by the Belgian troops, and, Political Officers having been appointed to the several districts, Lieut.-General Smuts, by virtue of the powers vested in him as General Officer Commanding-in-Chief, delegated to Mr. (now Sir H. A.) Byatt, who had been appointed Administrator by His Majesty's Government, the exercise of all powers vested in him under martial or other law (save only authority or jurisdiction over members of His Majesty's Forces and matters affecting military operations) within the area bounded in the north by the Uganda and East Africa Protectorates, on the east by the Indian Ocean, on the south by the Central Railway, and on the west by the Tabora-Mwanza Road to the southern boundary of the Mwanza district, thence to the Uganda frontier, including the district of Bukoba, but excluding the area of Biaramulu, which was occupied by the Belgians.

On March 1, 1918, the area placed under the jurisdiction of the Administrator was extended to include those portions of the districts of Morogoro and Dodoma which lay south of the Central Railway, the remaining part of the Tabora district, the districts of Kilwa, Rufigi and Dar-es-Salaam (exclusive of the township of Dar-es-Salaam), and four of the districts (Iringa, Mahenge, Langenburg* and part of Bismarckburg†) which had hitherto been administered under Major-General (now Sir E.) Northey by a Chief Political Officer, Mr. (now Sir H. L.) Duff. After the surrender of General von Lettow, in accordance with the terms of the Armistice, the remaining districts administered by the military authorities (Lindi and Songea) and the township of Dar-es-Salaam were placed under the Administrator on January 1, and the railways on April 1, 1919. The district of Ujiji, together with the northern part of Ufipa (Bismarckburg) and the southern part of Bukoba (referred to previously as the area of Biaramulu), though within the British sphere, are still (December, 1920) being temporarily administered by the Belgians.‡

On January 31st, 1919, a Royal Commission was issued appointing Sir H. A. Byatt, K.C.M.G., to be administrator of that portion of German East Africa which was occupied by His Majesty's Forces; and on the ratification of the Peace Treaty with Germany on January 10th, 1920, that part of the former German East African Colony which the Principal Allied and Associated Powers had agreed should be administered by Great Britain was named the Tanganyika Territory.

* Now called Rungwe.

† Now called Ufipa.

‡ The Principal Allied and Associated Powers have agreed, as previously stated, to Ruanda and Urundi continuing to be administered by His Majesty the King of the Belgians, and the Kionga area by the President of the Portuguese Republic.

His Majesty issued on July 22nd, 1920, an Order-in-Council known as the *Tanganyika Order-in-Council*, 1920, which was read and proclaimed in Dar-es-Salaam on September 25th, 1920, constituting the office of Governor and Commander-in-Chief; and by a Royal Commission, dated August 5th, 1920, Sir H. A. Byatt, K.C.M.G., was appointed Governor and Commander-in-Chief. The Governor is assisted by an Executive Council.

By appointing an adequate staff of administrative officers (108 for the 22 districts), by careful selection of the officers so appointed, and by weeding out all those who have shown that they are lacking in sympathy, tact, imagination, and patience, a good start has been made in the difficult task of building up an administration on the ruined system inherited from the Germans.

The policy which is being followed is to develop the people, so far as is possible, on their own lines and in accordance with their own ideas and customs, purified where necessary. No sweeping measures have been taken to dispense with the *Akidas*, but though they remain their status has been radically altered. Their privileges have been curtailed; their powers of punishment have been taken away, and they are being closely supervised. When vacancies occur, the wishes of the people as to a successor are ascertained, and, if possible, a local man of influence is selected in preference to an alien. Every endeavour is being made to restore the old tribal organisations, and it is hoped that in course of time the German conception of the *Akida* system will cease to exist, even though the name may remain.

Military Garrison.—Three battalions of the King's African Rifles are stationed in the Territory, each consisting of four companies. The establishment is at present 2,450 (native) combatants, with 99 European officers and non-commissioned officers.

(c) **Population.**—The territory administered by Great Britain was during the German occupation divided into 19 civil districts, 2 military districts (Mahenge and Iringa), and 1 Residency (Bukoba). It is now divided into 22 civil districts, as follows* :—

District.	Capital.	Native population on 31.3.1913, which is approximately the same to-day. The figures in italics show the density per sq. kilometre.	
Tanga	Tanga	108,400	<i>23·6</i>
Pangani	Pangani	98,500	<i>7·1</i>
Bagamoyo	Bagamoyo	72,800	<i>4·6</i>
Dar-es-Salaam	Dar-es-Salaam	161,500	<i>15·8</i>
Rufiji	Utete	89,100	<i>10·0</i>
Kilwa	Kilwa	96,200	<i>1·6</i>
Lindi... ..	Lindi	395,500	<i>8·2</i>
Songea	Songea	90,300	<i>1·6</i>

* As previously stated, the district of Ujiji and a portion of Ufipa and Bukoba are still (Dec., 1920) being temporarily administered by the Belgians

District.	Capital.	Native population on 31-3-1913, which is approximately the same to-day. The figures in italics show the density per sq. kilometer.	
Rungwe (formerly Langenburg)...	Tukuyu ...	195,800	<i>6.5</i>
Ufipa (formerly Bismarckburg) ...	Kasanga ...	81,700	<i>0.9</i>
Ujiji	Kigoma ...	240,000	<i>6.2</i>
Bukoba	Bukoba ...	270,500	<i>10.1</i>
Mwanza	Mwanza ...	620,000	<i>9.1</i>
Arusha	Arusha ...	84,200	<i>2.4</i>
Moshi	Moshi ...	118,300	<i>9.2</i>
Usambara (formerly Wilhelmstal)	Lushoto ...	98,600	<i>6.3</i>
Tabora	Tabora ...	437,500	<i>4.1</i>
Kondoa-Irangi	Kondoa - Irangi	218,300	<i>3.9</i>
Dodoma	Dodoma ...	299,400	<i>4.0</i>
Morogoro	Morogoro ...	158,400	<i>4.6</i>
Iringa	Iringa ...	90,000	<i>1.3</i>
Mahenge	Mahenge ...	120,000	<i>3.5</i>

The total native population in German East Africa on March 31, 1913, was about 7,600,000; the total native population in Tanganyika is now estimated at about 4,000,000, whilst the inhabitants of Ruanda and Urundi, administered by the Belgians, number 3,500,000.

It has not yet been found possible to take a census of the population, but it is intended to compile one in 1921. The figures given in this report must accordingly be regarded as tentative only.

Europeans.—The number of Europeans in Tanganyika Territory is approximately 2,200, 1,400 of whom are British (including 300 settlers from South Africa who had taken up land before the War, principally in the Arusha district), and 300 Greeks. The remainder are Poles, Italians, Czecho-Slovaks, Swiss, Dutch, Belgians, French, and Americans. With one or two exceptions, all Germans formerly resident in German East Africa have been repatriated.

Indians.—There are about 10,500 Indians in the country, 7,000 adult males and the remainder women and children. Some 6,000 of them are Mohammedans—Meman, Thenashiri, Ismaili, and Bohora; the others are Hindus, Buddhists, Sikhs, etc.; 2,500 Indians live in Tanga, 2,300 in Dar-es-Salaam, 1,200 at Tabora, 800 at Mwanza, 500 at Dodoma, 400 each at Bagamoyo and Lindi, and 300 each at Kilwa, Bukoba and Morogoro; 866 Indians are employed on the railways. Of the remainder, the majority are small tradesmen, the agents of Zanzibar firms, and they have most of the retail trade in their hands. A few are also market gardeners.

Arabs.—The number of Arabs and Baluchis is estimated at 000, of whom 800 live in the Kilwa district, 600 in Tanga, 500

in Bagamoyo, 400 in Dar-es-Salaam, 300 in Pangani, and 200 each in Tabora and Lindi. They are mostly landed proprietors, though many of their estates have passed into the hands of Indians.

Somalis, etc.—Some 2,000 Somalis, Abyssinians, and Sudanese have settled in the territory. The Somalis and Abyssinians are mostly itinerant cattle dealers, and are responsible for the spread of many cattle diseases. The Sudanese are the descendants of former German askaris, and own small holdings in or near various townships.

Goans.—The Goans number approximately 1,000, of whom 300 are in Dar-es-Salaam and 200 in Tanga. They are a useful community, since they fill the position of clerks to Government and to mercantile firms, furnish the best cooks in the country, and keep general stores, to which is generally attached a tailoring department.

(d) **Slavery.**—As a signatory to the General Act of the Anti-Slavery Conference of Brussels, 1890, and other International Treaties relating to the suppression of the institution of slavery, Germany took steps to prohibit slave-trading in her East African Protectorate, but permitted the existence of domestic slavery. Whereas Great Britain abolished the legal status of slavery in Zanzibar in 1897 and in the East Africa Protectorate in 1907, Germany contented herself with introducing legislation to ameliorate the conditions of the slaves' existence and to make it easier for them to obtain their liberty than it was formerly. For some years before the Great War Germany had contemplated the possibility of emancipating all slaves by one stroke of the pen, but she shrank from the great expense which might have to be incurred in compensating slave owners, and she feared the serious political disturbances which might ensue. The most important step taken was to decree that all slaves born after 1905 should be free; and it was thus thought that even if the extreme step of abolishing slavery were never taken, slavery would in due course die a natural death and would cease to exist after 1930 or 1940.

There is something repugnant to the European mind in the very idea of slavery, but the European mind does not always differentiate between slave-raiding or slave-trading and slave-owning. The former cannot be too strongly condemned or too rigorously suppressed; but the latter, though sometimes accompanied by harsh conditions, is not generally regarded with marked aversion by those whom it most nearly affects, *i.e.*, by the slaves themselves, who show no universal enthusiasm towards obtaining their freedom. Although slavery condemns large numbers of human beings to spend their lives in conditions which may be hard and are always unfair, yet it is only just to say that the form of slavery in existence in what was German East Africa is of a mild kind, which might be described as domestic servitude rather than domestic slavery. It had consequently been customary since

1899 for the Germans to refer to slaves as retainers, and to owners as masters. Slave-raiding and slave-trading, with their attendant horrors, are things of the past, and under the German law no slave might be sold without consenting to the transaction himself. Married couples might not be separated, and children under twelve years of age might not be taken from their parents. A slave has various privileges, *e.g.*, religious freedom must be accorded him; marriage may not be denied him; he can claim from his master food, board and lodging, and every week two days free; he may own property (but as the master has the right to inherit from his slave, he can claim to supervise the management of the property); he has a certain limited right of inheritance from his master; and his master must support him when he is too old to work.

Under the German law a slave might obtain his freedom in the following ways: ransom; manumission; official grant of letters of freedom (*e.g.*, in the case of ill-treatment); passing five years without working as a slave; and failure of heirs on the death of an owner. A female slave also became free if she married a free-man and the latter paid the bridal price to the owner, and when an owner acknowledged a child by his slave as his offspring.*

(*e*) **Missions.**—European Missions have done a good deal for the natives in education and medicine, and also in improving the native methods of agriculture. Only two British Mission Societies were represented in German East Africa before the War, the Universities Mission to Central Africa in the Tanga, Lindi and Songea Districts, and the Church Missionary Society in the Dodoma and Morogoro Districts. The other principal non-Roman Catholic Missions were the Leipzig, Berlin and Bielefeld Missions, the Moravians, and the Seventh-day Adventists.

The Roman Catholic Missions are represented by the Black Fathers (Mission du Saint Esprit), by the White Fathers and by the Benedictines (St. Ottilia).

(*f*) **Education.**—With a return to more settled conditions the all important problem of education is receiving the most careful consideration, and the work of reorganisation has already begun.

It is not quite clear whether the German education policy was designed definitely to develop the African and to improve his lot or merely to train him as an integral part of an efficient administrative machine. The success, however, which attended the efforts of the late Administration in the latter respect is undoubted, and the provision already made or foreshadowed for native education at the outbreak of war was a clear indication of the importance which the Germans attached to it. The vote for 1914 provided for 14 Europeans on the staff of the Education Department; there were already 99 Government schools, 10 of

(*Colonial Office Note.*)—The draft Mandate requires (Article 5) "the eventual emancipation of all slaves and as speedy an elimination of domestic and other slavery as social conditions will allow." The Governor has been asked to furnish a report on the measures necessary to give effect to this provision, and that report is now (July, 1921) awaited.

which were principal schools and the remainder elementary; provision had also been made to build a further 20 elementary schools during that year. The number of pupils in attendance at the principal schools in 1913 was 2,394, and at the elementary schools 3,706. There were also 108,550 children on the registers of the 1,832 schools conducted by the Missionary Societies.

The results of their system are to-day evident in the large number of natives scattered throughout the country who are able to read and write, and it must be admitted that the degree of usefulness to the Administration of the natives of the Tanganyika Territory is in advance of that which one has been accustomed to associate with British African Protectorates. Whereas the British official may often have had to risk the mutilation of his instructions to a chief by having to send them verbally, the late German system has made it possible to communicate in writing with every Akida and village headman, and in turn to receive from him reports written in Swahili.

It cannot be hoped that the threads of the work will be picked up at the point where they were dropped at the outbreak of war: it will probably take two or three years before the output from the schools, of the type of native able to read and write, will equal that of pre-war days. No time, however, has been lost in making a new beginning, and authority was given in December, 1919, to the District Political Officers to reopen some of the Government schools. The difficulty of tracing the old teachers has been considerable, while many of those identified with education during the late Administration have obtained other employment and do not desire to return to teaching. In spite of this, rather more than 20 Government schools have been reopened and as there are already 500 boys in attendance at these schools in one district alone, the magnitude of the task ahead can be realised.

A Director of Education was appointed in September, 1920, and is now engaged in framing a comprehensive scheme of native education which it is hoped will shortly be productive not only of a regular supply of native Africans suitable to the administrative needs of the Territory, but equally a more useful type whose elementary education has, in addition to giving him a working knowledge of the "3 Rs." done something to fit him to take an active part in the economic development of the country.

Immediate provision is to be made for the training of teachers; elementary schools are to be started at all District Headquarters and at the larger villages; and the first primary schools will be opened in 1921 at Dar-es-Salaam and Tanga. Industrial instruction in some form will be given at every school.

IV.—FINANCIAL.

(a) **General.**—A headquarters Treasury, under the Civil Government, was first established at Lushoto (Wilhelmstal) at the close of the year 1916, and on 1st January, 1917, the account-

ing operations of all Political Officers in the Northern area were transferred from Military to Civil control.

In the South-Western Area a Financial Officer had previously been attached to the staff of the Chief Political Officer at Tukuyu, and gradually as Political Officers were posted to the districts comprising this area, namely Rungwe, Ufipa, Iringa, Mahenge and Songea, their accounting operations came under the direction of the Financial Officer; but control was not transferred to the Civil Government proper until 1st March, 1918, on which date also the accounts of the Political Officers in the Central Area were likewise transferred. The accounts of the Political Officers in the Songea and Lindi districts did not come under civil control until the 1st January, 1919.

The financial transactions of the Island of Mafia have been incorporated in the Tanganyika accounts as from the 1st January, 1915.

The Civil Administration became liable for the cost of the three battalions of the King's African Rifles forming the garrison of Tanganyika Territory as from the 1st February, 1919, and for the cost of maintaining the railway system as from the 1st April, 1919. In this connection it should be explained that the cost of the garrison for the period 1st February, 1919, to the 31st March, 1920, for which no charges appear in the accounts to date, is in course of adjustment by the Chief Paymaster, King's African Rifles.

The following is a summary of the annual revenue and expenditure to 31st March, 1920:—

	£
Revenue to 31st March, 1917	128,622
„ 1917-18	336,446
„ 1918-19	461,842
„ 1919-20	669,097
	1,596,007
Expenditure to 31st March, 1917	35,116
„ 1917-18	157,285
„ 1918-19	383,097
„ 1919-20	790,026
	1,365,524
Excess of Assets over Liabilities	£230,483
(Surplus balance at 31st March 1920.)	

It will be observed that the expenditure for the year 1919-20, exclusive of the cost of the garrison (approximately £240,000 per annum), exceeded the revenue by £120,929. For the year 1920-21, it has been found necessary to obtain a grant-in-aid of £330,000 from the Imperial Treasury in order to meet the considerable railway deficit and to provide for essential disbursements in excess of revenue: so far as can be foreseen this amount will prove to be insufficient. In this connection it may be of interest to mention that grants by the Imperial German Government to German East Africa reached the lowest point in 1914, when £165,000 (M. 3,300,000) was provided.

(b) Revenue.—The appended statement shows the total revenue under the various heads to the 31st March, 1920 :—

Heads of Revenue.	To 31st March, 1917.	During the year 1917-1918.	During the year 1918-1919.	During the year 1919-1920.
	£	£	£	£
I. Customs	87,299	116,864	118,949	140,709
II. Port and Marine... ..	264	383	642	15,375
III. Licences, Taxes, &c. ...	35,983	196,343	290,373	308,887
IV. Fees of Court or Office &c.	1,448	8,203	24,379	41,216
V. Posts and Telegraphs ...	—	5,805	13,510	15,573
VI. Railways... ..	—	—	—	103,778
VII. Revenue from Government Property.	1,141	3,579	6,363	11,601
VIII. Miscellaneous	2,487	5,269	7,626	31,958
Total	128,622	336,446	461,842	669,097

Customs duties were first collected at Tanga in September, 1916, and at Dar-es-Salaam in October, 1916; and the receipts are included in the above statement.

(c) Expenditure.—The appended statement shows the total expenditure under the various heads to 31st March, 1920 (exclusive of the cost of the garrison: *see above*).

Heads of Expenditure.	To 31st March 1917.	During the year 1917-1918.	During the year 1918-1919.	During the year 1919-1920
	£	£	£	£
I. His Honour the Administrator... ..	14,685	9,358	7,694	7,432
II. Secretariat	—	—	—	6,857
III. Printing Office	414	2,062	3,460	3,895
IV. District Administration	18,436	63,621	102,077	107,014
V. Treasury	1,224	3,817	5,627	6,716
VI. Customs	2,289	8,188	10,180	9,865
VII. Port and Marine	—	—	15,269	80,493
VIII. Audit Department	—	1,057	1,503	1,462
IX. Legal Department	—	140	1,636	2,556
X. Police and Prisons	3,127	30,005	61,424	59,565
XI. Medical and Sanitation	1,506	10,199	35,382	48,807
XII. Veterinary	—	—	—	14,566
XIII. Education	—	—	—	174
XIV. Transport	237	1,776	3,895	2,665
XVI. Miscellaneous Services	721	1,811	38,023	44,379
XVII. Posts and Telegraphs	26	3,566	14,713	29,721
XVIII. Railways	—	—	—	278,591
XIX. Agricultural Department	503	1,652	4,269	2,176
XX. Forestry Department	—	—	—	525
XXI. Game Department	—	—	—	242
XXIII. Public Works Department	348	2,126	4,648	14,295
XXIV. Public Works Recurrent	416	3,491	11,903	37,063
XXV. Public Works Extraordinary	—	300	3,543	15,095
XXVI. Posts and Telegraph Extraordinary	—	146	—	1,411
XXVII. War Expenses	1,184	13,970	57,881	14,461
Total	£35,116	£157,285	£383,097	£790,026

(d) **Taxation.**—The revenue is derived principally from Customs dues, Hut and Poll taxes, and Trade taxes and licences.

The Customs Tariff imposes an *ad valorem* duty of 10 per cent. on imports generally, with the exception of spirits, on which a specific charge of Fls. 15 per gallon of 50 degrees alcohol at 15 degrees Centigrade is now levied. Export duties are mainly derived from Ivory (15 per cent.), Hides and Skins (10 per cent), and Livestock at various rates.

The hut tax is fixed at Fls. 3 per annum in country localities and Fls. 6, 9 and 12, according to the size of the hut, in township areas; and all able-bodied male natives who are not liable for hut tax pay a poll tax of Fls. 3 per annum. Trade taxes are assessed on the basis of 4 per cent. on the net proceeds.

Other sources of taxation include Firearms and Game Licences, Liquor Licences and Pombe and Tembo (native beer and wine) Licences, &c.

The sale of spirits to natives is prohibited.

(e) **Currency and Banking.**—The total amount of coins placed in circulation during the German administration is stated to be as follows:—

	Rs.
Rupees, German Government	10,000,000
„ Deutsch-Ostafrikanische Gesellschaft...	8,000,000
$\frac{1}{2}$ and $\frac{1}{4}$ rupees	1,000,000
Nickel and Copper (say)	300,000
Total ...	Rs. 19,300,000

Prior to the establishment of the civil Government, the question of the German local currency had been fully considered. It had been found impracticable to discount the German coins and eliminate them with as little loss as possible to the Government of occupation, because in the first place it was impossible at the time to obtain British coins to replace the German ones, and also because such a measure would have had a bad effect upon the natives. It had, therefore, been decided to recognise the German coins at their face value.

By General Routine Order No. 537 of 21st June, 1916, as amended later by General Routine Order No. 851 of 15th September, 1916, it was provided as follows:—

- (1) “ The following enemy coinage only is recognised and may be paid out or accepted at par:—

Deutsch-Ostafrika (G.E.A.) Protectorate coinage:—

One Rupee (silver)	= one Rupee British.
$\frac{1}{2}$ ” (”)	= 50 Cents ”
$\frac{1}{4}$ ” (”)	= 25 ” ”
10 Heller (nickel)	= 10 ” ”
5 ” (”)	= 5 ” ”
1 ” (copper)	= 1 ” ”

Deutsch-Ostafrikanische Gesellschaft Coins :-

Two Rupees	(silver)	
One Rupee	(")	
$\frac{1}{2}$	"	(")
$\frac{1}{4}$	"	(")

- (2) " No enemy paper currency of any description whatever will be recognised as legal tender nor will any payment of dues be made in such currency.
- (3) " No dealings may be made in German Imperial coinage, such as the Mark, &c., as their value is liable to fluctuation.
- (4) " Warning is given that the German local administration is coining war currency in gold Rs. 15 pieces and brass subsidiary coins. None of this currency is to be circulated or dealt in under any circumstances whatever."

In order to safeguard the several banks in their dealings with the German coins, the military authorities had arranged with their bankers, the National Bank of India, Ltd., to redeem from time to time all surplus balances held by the other banks, and had undertaken to redeem at any time all surplus balances held by the National Bank of India, Ltd., by giving in exchange credit at par in British currency at Nairobi or Mombasa.

Shortly after its establishment the civil Government was asked by the military authorities to give a similar undertaking, to take effect on the cessation of relief by the Military Pay Department. It was not, however, considered advisable to renew the undertaking but a guarantee was given to the effect that Government would not withdraw its declaration of German local silver coins and German local nickel and copper coins as legal tender unless and until they were prepared to redeem such coins with British currency at par.

From time to time difficulties inseparable from dealings in the local German currency have arisen. In the early days, for instance, before branches of the banks were established at Mwanza and Bukoba, merchants and traders were unable to effect remittances to the Kenya Protectorate to purchase or pay for goods except by drafts obtained through the military; and later it became necessary to sell Treasury drafts on Nairobi. To do this it was necessary to open a bank account at Nairobi to which was credited all Customs revenue collected at Mombasa in respect of goods imported into Tanganyika Territory overland by the Voi Railway and also all reimbursements by the military at Nairobi in respect of disbursements by the Civil Government to military units, or on account of military services, in the area under civil control. The establishment of this account, moreover, enabled an arrangement to be made with the Uganda Railway whereby freight charges on produce from Mwanza and Bukoba were accepted in German rupees, which were exchanged

for Indian rupees on presentation at the Standard Bank of South Africa, Ltd., Nairobi. In return for the traffic which thereby accrued, the Uganda Railway undertook to convey free of charge the German currency to Mombasa or Voi for repatriation to this Territory. Though utilised in the manner described, the German coins were never in fact in circulation in the Kenya Colony.

The banks have on occasions sought redemption of surplus balances; and as it was not possible to obtain Indian rupee coins, the export of which had been prohibited by the Government of India, it was found necessary in January, 1919, to import and issue one rupee Government of India notes for the sole purpose of paying off military porters. The Indian rupee notes were made legal tender by Proclamation No. 5 of 1918, but of the 8 lakhs imported only 2 lakhs were actually put into circulation, the remainder being returned by the military to the Kenya Protectorate. Subsequently, on the rise of the Indian rupee in value, the notes issued disappeared from circulation.

After the demobilization of the troops, surplus balances again began to accumulate in the hands of the banks, due partially, no doubt, to large credits in respect of military salvage sales. Recently, however, no less than 28½ lakhs of surplus coin have been redeemed by the newly established East African Currency Board by payment of the equivalent at ten rupees to the £ sterling in London; and, in consideration of the amount redeemed, the banks agreed to surrender 11 lakhs of German rupee coins in exchange for an equivalent amount of the new issue of one florin currency notes. The 39½ lakhs of German rupees thus acquired have been shipped to the Currency Board, London.

An Order in Council dated the 26th April, 1920, and published in the Official Gazette of the Kenya Colony on the 2nd June, 1920, was issued replacing the former Currency Orders in Council in force in that Colony, and making provision for the coining of a British East Africa silver florin as well as subsidiary silver 50 and 25 cent pieces, and 10, 5 and 1 cent pieces of other metal. The florin is to be the standard coin of the Kenya Colony and Uganda Protectorate, and all contracts, &c., are to be deemed to be made according to the standard coin. Florins will be legal tender for the payment of any amount, and the subsidiary coins will be legal tender for amounts not exceeding five florins in the case of silver and one-half of a florin in the case of other metals. Where any sum payable after the commencement of the Order is payable in pounds sterling, payment may be made at the rate of ten florins to the pound sterling, or if the sum is payable in rupees, florins may be substituted.

It is proposed eventually to introduce a similar measure in this Territory, but in the meantime the German rupee has been standardised locally as the equivalent of a florin, or ten rupees to the pound sterling, and provision has been made for the issue of currency notes.

The following is a list of banks operating in the Territory :—

Standard Bank of South Africa, Ltd. :—

<i>Branches.</i>	<i>Date of Opening.</i>
Tanga	19th October, 1916.
Dar-es-Salaam	1st December, 1916.
Tabora	18th October, 1917.
Mwanza	2nd January, 1918.
Bukoba	3rd September, 1919.
Moshi	10th August, 1920.
Lindi	26th August, 1920.

National Bank of India, Ltd. :—

<i>Branches.</i>	<i>Date of Opening.</i>
Tanga	19th October, 1916.
Dar-es-Salaam	1st December, 1916.

National Bank of South Africa, Ltd. :—

<i>Branches.</i>	<i>Date of Opening.</i>
Tanga	27th November, 1916.
Dar-es-Salaam	1st December, 1916.
Tabora	3rd October, 1917.
Mwanza	December, 1917.
Lindi	30th August, 1920.

Banque Du Congo Belge :—

<i>Branch.</i>	<i>Date of Opening.</i>
Dar-es-Salaam	18th March, 1918.

V.—TRADE, AGRICULTURE, AND INDUSTRIES.

(a) **Trade.**—Owing to the blockade of the coast of German East Africa, the Colony was closed to external trade during the first two years of the War. After the northern part of the territory had been occupied by the British Forces, the port of Tanga was reopened to traffic, and a Customs Station established, on September 10th, 1916. The Customs Tariff of the East Africa Protectorate was introduced, and Customs procedure inaugurated under Martial Law.

As soon as the exigencies of the military operations permitted, the following other ports were re-opened on the dates shown :—

Dar-es-Salaam	October 10, 1916.
Mwanza and Bukoba (Lake Victoria)...	December 2, 1916.
Pangani and Bagamoyo	February 15, 1917.
Saadani	April 21, 1917.
Musoma (Lake Victoria)	May 18, 1917.
Bismarckburg* (Lake Tanganyika) ...	} October 15, 1917.
Mwaya (Lake Nyasa)	
Moshi (Frontier Station)...	April 15, 1918.
Kilwa	May 21, 1918.
Lindi	February 1, 1919.
Wiedhafen† (Lake Nyasa)	June 1, 1919.

Owing to the protracted military operations, which were still being continued when the Armistice was signed on November 11th, 1918, the trade of the territory suffered severely. With the exception of a few shipments of foodstuffs for the consump-

* Now called Kasanga.

† Now called Manda.

tion of the civil population, obtained by transports from India, the trade was restricted to the neighbouring Protectorates, and the cargoes were conveyed by native dhows. Agriculture was almost at a standstill, and excepting only the enemy-owned sisal plantations in the northern districts, which were leased, all agricultural industries were abandoned. The locally-grown food-stuffs and oils not required for the native population were, to a large extent, requisitioned for the troops.

It was impossible for any European firms to establish businesses at Dar-es-Salaam, the main trading centre, and the headquarters of the British Military forces, owing to the lack of accommodation for offices, godowns and quarters. As soon, however, as the evacuation of the troops had been completed all vacated premises were eagerly rented by firms from the Custodian of Enemy Property.

The trading position was further hampered by the existing German currency, which was not accepted as legal tender in the neighbouring Protectorates. Transfers of specie were consequently impracticable, and remittances were limited by the banks.

(b) **Shipping.**—During the year ended March 31st, 1920, the following steamship lines established agencies at the ports of Dar-es-Salaam and Tanga; the services are irregular, and calls at these ports depend on the inducement offered for inward and outward freights:—

Union-Castle Mail Steamship Co., Ltd.
 British India Steam Navigation Co., Ltd.
 Clan, Ellerman & Harrison Joint Services.
 Natal.
 Messageries Maritimes.
 Marittima Italiana.
 Transportes Maritimos de Estado.
 Scandinavia East Africa.
 Cowasjee Dinshaw & Bros. (Coastal).
 Zanzibar Government (Coastal).

Coastal communication between Dar-es-Salaam, Tanga, Lindi, and other ports when necessary, is maintained by the Government s.s. "Lord Milner."

In the following list the number of steamers (other than coastal) which entered and cleared at coastal ports during the year ended March 31st, 1920, is given:—

Nationality.	No.	Net Reg. Tonnage.	Tonnage Cargo.	
			Inwards.	Outwards.
British	44	154,432	3,298	43,385
Italian	7	16,833	41	992
Portuguese	6	19,280	9	83
French	1	1,023	1,000	8
Norwegian	1	1,872	497	107
	59	193,440	4,845	44,575

The number of dhows which entered and cleared at the various ports during the same period is as follows :—

	No.	Tonnage.
Dar-es-Salaam	608	19,549
Tanga	509	11,953
Bagamoyo	282	3,576
Lindi	188	7,498
Pangani	102	1,724
Kilwa	68	1,543
Saadani	35	314
	<hr/>	<hr/>
	1,792	46,157
	<hr/>	<hr/>

The ports on Lake Victoria are served by the Uganda Marine Steamers; those on Lake Nyasa by the Nyasaland Government steamers; and a Belgian service together with a small steamer belonging to the British Government maintain communications on Lake Tanganyika.

(c) **Port Facilities.**—All steamer cargoes at Dar-es-Salaam, Tanga and Lindi are discharged into lighters and landed at the Customs wharves. Efficient lighterage services obtain at the ports of Dar-es-Salaam and Tanga. The harbour of Dar-es-Salaam lends itself to development. By the extension of the existing wharf and piers, berthage could be provided for two ocean-going steamers, and thus effect a saving of expense to the consignee and the quick despatch of shipping.

(d) **Interior Trade Communications.***—The territory is served by two railways, the Central Railway from Dar-es-Salaam to Kigoma (780 miles) and the Tanga Railway from Tanga to Moshi (222 miles), with a temporary line from Kahe station linking up with the Uganda Railway at Voi. It is anticipated that as soon as the whole of the Central Railway comes under British control the transit trade to and from the Belgian Congo will be facilitated. The Tanga Railway runs roughly parallel to the frontier of Kenya Colony and taps the fertile districts of Usambara and Kilimanjaro. Motor transport is at present possible only on a few good roads, but the expansion of trade will in course of time necessitate the construction of roads suitable for motor traffic and the establishment of motor transport services to act as feeders to the Central Railway.

(e) **Imports and Exports.**—Statistics of the principal articles of import and export for the years 1912 and 1913, and the years ended March 31st, 1918, 1919 and 1920, are given in Appendices I and II. The statistics do not include the values of imports into and exports from Mafia Island, which is still administered by the Zanzibar Government.

* For further particulars see page 80.

In order to form an accurate idea of the value of trade for the year ended March 31st, 1920, for purposes of comparison with that of the year 1913, the following points must be remembered :—

- (a) The Central Railway was under construction in 1913, and imports of rails, rolling stock, &c., to the value of Rs. 4,100,000 are included in the figures shown for that year.
- (b) The fertile and thickly-populated districts of Ruanda and Urundi are not included in Tanganyika Territory.
- (c) Numerous European plantations have not been cultivated, and the consequent unemployment of labour has reduced the purchasing power of the native.
- (d) The development of agriculture and other industries has been suspended.
- (e) As a result of drought, the inhabitants of a large portion of the territory suffered during 1918 and 1919 from famine.

The value of the imports and exports for the past three years is as follows :—

—	Imports.	Domestic Exports.	Re-exports.
1917-18	Rs. 16,642,895	8,970,434	543,923
1918-19	„ 15,116,097	10,114,366	393,261
1919-20	„ 17,376,405	19,940,156	1,445,912

These figures do not include the following items :—Cotton (lb. 579,841, Rs. 555,654) and Sisal (tons 4,773, Rs. 3,711,900), exported by the Custodian of Enemy Property, and Mica (tons 146, value approximately Rs.600,000), for the Ministry of Munitions.

The transit trade was limited to Dar-es-Salaam and Bukoba for goods in transit to and from the Belgian occupied territory and the Belgian Congo. The following figures show the value of the imports and exports :—

	Imports.	Exports.
1917-18	Rs. 142,815	164,240
1918-19	„ 433,809	235,913
1919-20	„ 647,989	832,018

The exports consisted mainly of hides, skins, beeswax and ivory.

(f) **Imports.**—Cotton piece-goods constitute the most important class of imports. Unbleached cotton (Americani and Shadda), originating from the mills of India and Japan, account for

approximately 48 per cent. of the total value of cotton piece-goods.

The importation of rice has decreased considerably during the last year under review owing to the restricted exports from India, the enhanced cost, and the success which has been achieved in encouraging the natives to extend the areas of rice under cultivation. It is believed that, with favourable rains, this territory should be in a position to grow sufficient rice for local consumption.

Importations of building material, machinery, foodstuffs for European consumption, hardware, enamelware, earthenware and glassware have been exceedingly limited. This is due to the unavoidable delay in reopening the European plantations, the cessation of building activities, the limited European population, and the difficulty experienced in obtaining various classes of iron and steel manufactured goods from the United Kingdom.

(g) **Exports.**—The principal articles of export from this territory were sisal, cotton, hides, skins, copra, coffee, groundnuts, ghee, grain, beeswax and sim sim (sesamum).

Sisal Hemp.—The majority of the enemy-owned plantations were leased, but the industry was severely hampered for some considerable time by the lack of ocean tonnage. The exports for the three years ended March 31st, 1920, amounted to 28,042 tons and at the close of that period about 1,000 tons were awaiting shipment. The output of sisal has since been restricted by the curtailment in development of the plantations and decrease in the home market values.

Cotton.—The exports during the British occupation mainly consist of enemy stocks sold locally. An effort is now being made to encourage the cultivation of cotton by the natives.

Hides and Skins.—The export was restricted during the year 1917 and 1918. The exports for the year ended March 31st, 1920, represent accumulated stocks.

Copra.—During the last year the export has increased considerably. The oil is manufactured locally to a large extent for food and for the manufacture of soap.

Coffee.—Coffee is produced mainly in the Bukoba, Moshi and Arusha districts. The coffee grown by the natives of the Bukoba district is of inferior quality.

Groundnuts.—The area under cultivation has been gradually extended and with favourable seasons and higher values in the Continental markets it is anticipated that great strides will be made in the production and export of this product.

Grain.—Favourable markets are obtainable on the Arabian Coast and Zanzibar for millet. Large harvests have been reaped within the past year.

Sim Sim.—This oleaginous seed is obtainable in large quantities and is exported mainly to Zanzibar, whence it finds its way to the French market.

(h) **Trade Distribution**.—The bulk of the trade was distributed between the adjoining territories and India, but with the improvement in shipping facilities trade is gradually being extended direct to European markets.

(i) **General**.—The commercial potentialities of the territory have attracted a considerable number of European firms, and Chambers of Commerce have been established at Dar-es-Salaam, Tanga, Mwanza and Bukoba. Pending the liquidation of enemy properties and the opening up of the agricultural, mining and other industries, efforts are being made to secure a more intimate knowledge of the classes of goods suitable for the trade, the trade centres of the territory, and the possibilities for the restoration of the various industries.

(j) **Weights and Measures**.—It is intended to introduce the Imperial Standards at an early date.

(k) **Agricultural Production**.—Particulars relating to the principal agricultural products in the territory during the past three years have already been given, and it is only necessary to refer here to two important articles of export in pre-war days, *viz.* : rubber and cotton, the former of which no longer figures in the export returns, whilst the amount of the latter now exported has been considerably reduced and consists mainly of enemy pre-war stocks sold locally.

Rubber.—The failure of the rubber industry was predicted by the British Vice-Consul in his report on the Trade, Condition and Economic Position of German East Africa for the years 1912 and 1913 (Diplomatic and Consular Reports, No. 5441, Annual Series), and his remarks in this connection are worth quoting : “ The area under rubber cultivation in German East Africa increased from 81,705 to 112,257 acres in the year 1912 and the amount of rubber exported increased from 684 metric tons, with a value of £180,500, to 1,017 metric tons, with a value of £362,012. In addition to the above acreage under *Manihot Glaziovii*, there were 1,010 acres under various other rubber trees. At the end of 1913 there were not far short of 19,000,000 rubber trees in the Protectorate, of which about half were ripe for tapping. The approach of the crisis in the rubber industry due to the over-production of Eastern rubber was foreseen in 1913, but it fell, nevertheless, with unexpected suddenness on the plantations in German East Africa, and will prove a serious set-back to the promising economic development of the colony. The large plantations, with their heavy working expenses, are the worst sufferers, as it costs them about 2s., f.o.b. and 2s. 1d., c.i.f. to produce their rubber. The small planters, many of whom employ cheap local labour, can produce at less expense, and it is possible that they will weather the storm, but the outlook is not reassuring for the large plantations. In response to urgent appeals, a certain

amount of assistance has been afforded by the Government, but it is unlikely that any official assistance will enable the planters to effect the very considerable reduction in the cost of production they will require if the price of rubber does not rise. Of this there seems small permanent hope. The improvement of the quality of the rubber exported by the establishment of a standard quality, and the planting of crops, such as beans, maize, &c., which yield quick returns, to supplement or even replace the rubber trees, may afford the planters a way out of their difficulties, at least, temporarily."

By the middle of 1914 the complete failure of the rubber industry was apparent, and several of the plantation owners were contemplating up-rooting their trees and planting the areas with sisal when war broke out. Now one sees in the neighbourhood of both railways vast forests of ceara rubber, which, so far as can be ascertained, are quite useless.

The amount of rubber exported from German East Africa (Tanganyika Territory) since 1912 is shown in the following table :—

			Plantation.	Wild.
	1912	... ..	1,030 tons	173 tons.
	1913	... ..	1,287 "	79 "
	1914	... ..	812 "	— " to 31/7/14
	1915-16	... ..	— "	— "
year ended	31/3/18	... ..	246 tons*	6 tons.
	31/3/19	... ..	171 " *	2 "
	31/3/20	... ..	75 " *	32 "

Cotton.—Efforts are being made to revive the cotton industry and 100 tons of seed have recently been imported from Uganda for distribution amongst the natives. The following remarks on cotton-growing in German East Africa, which have been culled from various German reports, may be of interest :

When the Germans first occupied the territory the natives were growing for household purposes Indian cotton (*Gossypium Herbaceum*) on the coast and Peruvian Cotton (*Gossypium Peruvianum*) in the region of the great lakes.

Attempts on the part of the Germans to establish cotton plantations can be traced back as far as the late eighties. Very little, however, came of such efforts until 1902, when the Kolonial-Wirtschaftliche Komitee (Colonial Economic Society), which corresponds to a certain extent to the British Cotton Growing Association, sent to Hamburg some samples of Egyptian cotton, grown by them in the coast districts, that met with a favourable reception on the home market. As a result, the Colonial Government adopted a policy of "encouraging" the natives to grow cotton. In this connection it is interesting to note that the then Governor, Count von Goetzen, in his report on the native rebellion in 1905, mentions compulsory labour on European cotton estates as one of the contributory causes of the trouble.

In the same year (1905), the Kolonial-Wirtschaftliche Komitee founded a school at Mpanganya on the Rufiji River for the pur-

* German stocks. No rubber has been produced since the British occupation.

pose of giving instruction to natives in the methods of growing cotton. This establishment was taken over by the Government in 1910, and was regarded as the model of the Government cotton stations, which, at the outbreak of war, existed at Myombo in the Kilosa district, at Makiwa in the Lindi district, and at Kibongoto in the Moshi district. The cotton stations were intended to fulfil the double purpose of teaching the natives to plant cotton and of supplying the colony with seeds.

While cotton was regarded primarily as a native product, the number of European plantations steadily increased. In 1910 there were 17 estates, comprising about 2,000 hectares, which were devoted to this product alone, and 24 other estates that grew cotton in addition to other crops. In 1913 the area actually planted with cotton by European concerns is given as 12,941 hectares, whilst about 15,000 hectares were under cultivation by natives. With a view to increasing the area under cotton an experiment combining European and native cultivation was tried in the Lindi district in 1912-13. The European planted up 500 hectares with cotton, cereals and vegetables, erected a ginning plant, cleared the adjoining land, and leased it to natives; but whether this experiment succeeded is not known.

In 1902 less than half a ton of cotton was exported from German East Africa; in 1910 the export figures were 623 tons of a value of Marks 751,000; and in 1912, 1882 tons of a value of Marks 2,100,000. The estimate of the Kolonial-Wirtschaftliche Komitee for the 1913-14 crop was 12,000 bales (3,000 tons); what the actual figures were is not known, but in 1917 our troops captured 13,000,000 lb. of cotton in the Rufiji Delta.

In 1911 seventeen steam ploughs (in many parts of the country oxen cannot be used owing to tsetse fly), 14 power gins and 49 smaller gins were in use on cotton plantations.

The success of cotton planting depends largely on transport facilities, and the old established cotton districts were Kilosa, which lies on the Central Railway, and the Rufiji valley, which is within easy reach of the port of Kilwa. Mwanza and Lindi are also important cotton-growing areas, but of more recent development: for the Mwanza district transport was provided by a service of motor lorries, while the Kolonial-Wirtschaftliche Komitee erected a light railway for conveying cotton to the port of Lindi.

Disinclination on the part of the native to plant cotton has been one of the principal setbacks to the industry in German East Africa; and a fall in price deters the native more than a pest or disease, of which he knows the cause. It is said that the high prices of 1908, followed by the slump in 1909, when the price fell to 4 hellers* per half kilo, gave the native the idea that the high prices of one year were simply a device to make him plant cotton to enable the merchant to purchase from him at very low prices in the ensuing year. To cope with this difficulty the Kolonial-Wirtschaftliche Komitee in 1910 guaranteed a minimum buying price to natives operative in the absence

* 100 hellers = one German rupee.

of other buyers or in case of such buyers offering a lower price. These guaranteed prices were 8 to 10 hellers per half kilo for unginned Egyptian and 5 to 6 hellers per half kilo for unginned Upland cotton.

In 1912, owing to the great increase in cotton production and the fluctuating prices, the Kolonial-Wirtschaftliche Komitee considered that they were running an undue risk in maintaining the guaranteed price, which was becoming unnecessary, particularly in the older cotton districts, and the Government was considering as an alternative the adoption of the system of licensing buyers, which, as stated in a German official despatch, has proved so successful in Uganda. An ordinance was accordingly drafted, but was never enacted, and the guaranteed prices were still being offered by the Kolonial-Wirtschaftliche Komitee at the outbreak of war, as may be seen from the German Official Gazette of 13th June, 1914.

Another question which received much consideration from the German Government was the supply of pure seed and the maintenance of the quality of cotton for the purpose of standardising it for the Home Market. For many years the Kolonial-Wirtschaftliche Komitee supplied seed free to District Officers for distribution to natives, and up to 1911 went so far as to pay the freight to the nearest station. Contracts for the supply of seed were made with planters who were guaranteed a minimum price of 7 Marks per cwt. of ginned seed, the planter being bound by the terms of the contract to maintain the quality of the seed and to weed out all *Hindi* (Indian) cotton. As the Government cotton stations developed the Government itself was able to provide a considerable portion of the seed required; at the same time under Section 2 of the ordinance "to regulate the importation of cotton seed and to control cotton fields," of the 30th July, 1910, all importation of cotton seed was prohibited excepting Egyptian seed direct from Egypt and Uplands which had actually been grown in Nyasaland or Uganda, while a Governor's order of the 1st October, 1910, made it an offence for a non-official to issue seed to natives. European planters could obtain seed at very moderate prices from the Government cotton stations, for the maintenance of which and for the furtherance of cotton-growing generally, an annual provision of 200,000 marks was included in the estimates for 1913 and 1914.

There seems to have been considerable controversy as to the variety of cotton best suited to the country. The Government stations experimented with every kind of seed, and the annual reports of the Mpanganya Station give full details of the results of these experiments. General opinion seems to have favoured Egyptian cotton—Abassi or Metafifi—in districts averaging below 600 metres above sea level, and "American Uplands" in higher altitudes. The official *Denkschrift* for 1912-13, however, stated that the tendency in native cotton-growing was to abandon Egyptian for Uplands, for though the quality of the latter is somewhat inferior, the yield is greater, and the plant is better able to withstand pests and unfavourable weather. *Caravonica* does not seem to have proved a success.

At the 1914 exhibition of the Deutsche Landwirtschafts Gesellschaft at Hanover, German East Africa obtained the two first prizes, the recipients being Bezirksamt (District Office) at Mwanza, and the Government cotton station at Mpanganya: in both cases the variety was Nyasa Upland. A native Government official named Amiri bin Nakihu was awarded a second prize for Egyptian Assili grown near Kilwa, and the Otto-Pflanzung at Kilosa also obtained a second prize for Nyasa Upland; various thirds and honourable mentions were given for Nyassa Upland at Kilosa and Shinyanga, also a mention for Nyasa Upland with a mixture of Abassi in the Moshi district.

A monograph entitled *Die Schädlinge der Baumwolle in Deutsch-Ostafrika*, by Dr. H. Morstatt, of the Government Institute at Amani, which was published in 1914 as a supplement to *Der Pflanzer*, gives a comprehensive survey of cotton pests in the Colony. Chief among these appear to be *Gelechia Gossypiella* or Bollweevil (German, *Krauselkrankheit*), and section 7 of the Cotton Ordinance 1910, which enforces the burning of cotton fields after harvest before such date as may be fixed by the District authority, is aimed at this pest in particular.

Apart from pests, the uncertainty and partiality of the rainy season in German East Africa always threatened the prospects of the cotton planter. As an instance, the crops in the Bagamoyo district failed in 1909 through drought, whilst in the adjoining district of Pangani the crops at the same time suffered severely through excess of rain.

If on the outbreak of war cotton-growing in German East Africa had passed beyond the experimental stage, it is clear that this result was due in the first place to the Kolonial-Wirtschaftliche Komitee, and in the second to the German Government. Every possible form of stimulus was applied. The native was encouraged, and, in some cases, forced, to plant; seed was given to him; teachers were employed; and text books in the vernacular were published for his benefit. The European planter was enabled to purchase machinery at manufacturer's price; freights were regulated, and space secured for him; while the German Government not only framed special legislation designed to maintain the standard of the product, but even contracted with a Bremen firm for the supply of information to district officers as to the requirements of the Home Market.

The following are the principal text books which have been published on cotton-growing in German East Africa:—

Anleitung für die Baumwollkultur in den Deutschen Kolonien, by Professor Zimmermann, Berlin.

Mafundisho ya kupanda Pamba, published by the Kolonial-Wirtschaftliche Komitee, Berlin.

Schädlinge der Baumwolle in D.O.A., 1914, supplement to *Der Pflanzer*, Dar-es-Salaam.

Der Pflanzer, formerly published officially at Dar-es-Salaam, which embodied the researches of the Biological and Agricultural

Institute at Amani, contained various articles on cotton; as also *Der Tropenpflanzer*, the official organ of the Kolonial-Wirtschaftliche Komitee, published at Berlin.

(i) **Live Stock and Veterinary.**—There are nearly three million head of cattle and five million head of sheep and goats scattered over the 365,000 square miles of Tanganyika Territory. That such numbers exist in spite of the ravages of disease is a very favourable indication of the potential wealth which lies in the stock industry. Fostered and developed on suitable and approved lines there would seem to be no direct impediment to this industry eventually becoming one of the greatest of its kind in any tropical country.

Under existing conditions, stock-raising, which is almost entirely in the hands of the pastoral tribes of the territory, is not carried out on scientific or modern lines of even the most rudimentary kind: herds merely increase and multiply in the ordinary chance manner; there is little or no selection of bulls or discrimination in mating; aged and worn-out breeding animals of both sexes are retained, and consequently a proportion of the young stock lack virility, size and quality, peculiarities which they, in turn, transmit to succeeding generations. It is manifest that remedies could and should be applied to this state of things.

At present, stock diseases are undoubtedly a serious menace, but they can be dealt with, and provided that the necessary funds and staff are forthcoming, the problem of eliminating, or, at least, reducing them to an insignificant minimum, is not beyond our powers.

At the present time contagious bovine pleuro-pneumonia is known to exist in two districts of the territory, Arusha and Mwanza. Every effort is being directed towards the prevention of the spread of this disease and extensive quarantine measures have been put in operation. Until recently the disease was confined to the former area, having been introduced from Kenya Colony, but it has now spread to the eastern shores of Lake Victoria. All infected kraals and herds in the Arusha District have been concentrated with a view to reducing as far as possible the risks of a further spread of the disease, and a systematic scheme of inoculation is being undertaken. When more definite information as to the regions infected in the Mwanza District is available a similar procedure will be carried out in that area.

Rinderpest and East Coast Fever have long been the causes of serious mortality amongst stock in Eastern Africa. It is, however, an established fact that wherever a Veterinary Department with an adequate and efficient staff has dealt with rinderpest, it has succeeded in either completely eradicating the disease or controlling it to such an extent that the losses resulting from it have been nominal. Rinderpest is no more indigenous to Eastern Africa than it is to Europe or South Africa. At one period it threatened the stock trade of the United Kingdom quite

as much as it does that of East Africa to-day, yet it was stamped out at home; is stamped out in South Africa, and by the adoption of sufficiently active measures, it can be stamped out in East Africa. The causal organisms of the disease do not live and multiply in the soil, and remain active for only a brief period, apart from the animal body. Unlike diseases such as anthrax and tetanus, whose organisms thrive in the soil, every case of rinderpest is directly dependent for its occurrence on a previous case. That East Coast Fever can be eradicated through the agency of regular and systematic dipping, has been proved conclusively in both South Africa and Kenya Colony, where large areas that were formerly useless from a stock point of view are now carrying numerous herds of imported cattle. There are, therefore, means of successfully combating in this territory the two diseases whose combined ravages are responsible for at least 90 per cent. of the preventable death rate.

The advantages which would undoubtedly accrue to the establishment of a modern system and policy of dealing with the livestock question, would be relatively enormous. Herds would not only increase numerically but could be improved in the quality of their individuals to an extent which would be in direct proportion to the outlay of effort and enthusiasm put into the scheme.

The primary essential to the ultimate success of the stock industry in this territory is the provision of an efficient and adequate Veterinary Department incorporating a pathological laboratory and a serum-producing and research institute, staffed and equipped on modern lines. The necessary initial steps have already been taken, but great difficulty is being experienced in obtaining officers with the requisite qualifications. The primary aim of the department will be to prevent disease; closely allied to this is the progressive advance in the normal standard of animal hygiene and kindred subjects, and the consequent improvement in type and numbers. Both are too intimately related to be separated, and that the policy of combining them under one organisation and subjecting them to a central control is sound, is evident from the success of the American Bureau of Animal Industry. It is therefore proposed that the Veterinary Department in Tanganyika Territory should be in a position to deal with all matters connected with (a) Government stock farms, established with a view to training and educating the native in modern and improved methods of stock management; (b) the introduction of suitable types of cattle and sheep for grading purposes; (c) treatment of hides for export; (d) the progressive building up of a dairy industry, more especially directed towards ghee production for export; (e) water conservation in stock areas; (f) the inauguration of an export meat trade and the encouragement of canning industries.

The evolution of the desired organisation will, of necessity, be both gradual and slow, but at the present time, owing to lack

of staff, a commencement has scarcely been made. No sooner is one outbreak of cattle disease suppressed than another or sometimes two or three others are reported. Quarantine restrictions are enforced when possible, but they are not difficult to break owing to lack of adequate supervision.

In order to repair as much as possible the damage done to native herds during the late campaign, legislation was enacted in 1919 prohibiting the slaughter of female breeding stock and immature male stock. Such a measure has undoubtedly already assisted in preserving a large number of excellent breeding stock, which would otherwise have been unnecessarily sacrificed.

(m) **Forestry.**—The most important timber forests in the Territory are situated in the Usambara highlands and along the lower course of the Rufiji. Forest reserves were gazetted by the Germans, particularly in the coastal districts, and these are under the control of the Government Forestry Department, which has recently been created. The reserves cover an area of 1,855,270 acres, and contain many valuable woods, e.g., cedar, podocarpus, juniper, black-wattle, camphor, teak, and mangrove.

Cinchona.—*Cinchona* is grown on a few European plantations and also at the Amani Institute. According to the Annual Reports of the latter, about 60 cwt. of bark were produced at Amani in 1912-13, and 100 cwt. the following year.

Most of the trees were cut down by the Germans in 1915, to supply the troops with quinine; but at the beginning of 1918, and again in 1919, samples were sent to the Imperial Institute and the following reports were received* :—

1918 Report.—No. 1. *Cinchona robusta* B.L.I. Amani. This sample consisted of quilled chips, somewhat broken and varying from moderately large to very small and thin. The outer surface of the chips was brown, and covered with lichen in a few cases, while the inner surface was a light warm brown colour.

No. 2.—*Cinchona succirubra*. This consisted of quilled chips, rather broken, and of variable size, chiefly fairly thick. The chips were of light warm brown colour, rather darker on the outer surface, and showed occasional patches of lichen.

No. 3.—*Cinchona ledgeriana*. This consisted of quilled chips, of mixed size, some pieces being fairly thick and others thin and narrow. The outer surface of the chips was of a warm brown colour and mostly covered with lichen, while the inner surface had a light brown colour. The sample was somewhat broken.

No. 4.—*Hybrid C. ledgeriana* x *C. succirubra*. This sample consisted of thick, large quilled chips, of a warm brown colour on the outer surface, which was mostly covered with lichen, and light brown on the inner surface.

* These reports were printed in the Bulletin of the Imperial Institute, Vol. XVI, No. 3, July—Sept., 1918, and Vol. XVIII, No. 1, January—March, 1920.

The value of cinchona barks of these types depends chiefly on the amounts of quinine sulphate obtainable from them, and this in turn depends on the process used by the quinine manufacturer. For this reason samples of the barks were submitted to a British firm of quinine manufacturers for examination and valuation. The results of the chemical examination of the four samples are shown in the following table :

	No. 1. C. robusta.	No. 2. C. succirubra.	No. 3. C. ledgeriana.	No. 4 C. ledgeriana x C. succirubra.
	Per cent.	Per cent.	Per cent.	Per cent.
Moisture ...	8.1	7.9	8.9	7.5
Total alkaloid...	7.61	8.32	5.00	11.30
Quinine ...	2.66	2.54	3.81	8.41
Cinchonidine ...	3.51	2.05	Nil	Nil
Yield of crystal- ised quinine sulphate ...	3.55	3.39	5.08	11.21

No. 1. *Cinchona robusta*.—The bark of this species generally contains 5 to 6 per cent. of total alkaloid, including 2 per cent. of quinine. The present sample therefore contains a high percentage of both total alkaloid and quinine.

No. 2 *Cinchona succirubra*.—This sample represents a good quality of *C. succirubra* bark, which usually contains from 1½ to 3 per cent. of quinine and about the same amount of cinchonidine.

No. 3. *Cinchona ledgeriana*.—This contains a rather low percentage of alkaloid for the species it represents, as Ledger bark usually yields about 7 per cent. of total alkaloid, about 5 per cent. of quinine, and little or no cinchonidine. These figures are sometimes exceeded, the total alkaloid reaching 12 per cent. and the quinine 10 per cent.

No. 4. *Ledgeriana Hybrid*.—The Ledgeriana hybrids are similar in composition to Ledger bark, containing high percentages of quinine and little or no cinchonidine. The present sample of hybrid bark is of very good quality, yielding 11.30 per cent. of total alkaloid and 8.4 per cent of quinine alkaloid. This bark is the most valuable of the four samples received.

It is recorded in *Der Pflanze* (1906, 2, 336), that two samples of bark taken in 1906 from four-year-old trees of hybrids *C. ledgeriana* x *C. succirubra* at Amani yielded 6.47 and 6.80 per cent. of quinine sulphate respectively. In the latter sample the total alkaloid was 6.77 per cent., of which 4.84 per cent. was quinine. The present sample of the hybrid bark is therefore considerably richer in total alkaloid and quinine than these two samples of young bark.

The firm of quinine manufacturers to whom the samples were submitted reported that for their purpose the present values of barks of the composition shown in the table of analyses and *ex* London warehouse would be as follows :—

No. 1	Per lb.	No. 3	Per lb.
	8½d.		1s. 0¼d.
No. 2	8½d.	No. 4	2s. 3d.

For comparison with these prices it may be stated that the normal approximate values of these barks on the basis of the prices current immediately before the War would be:—

No. 1	Per lb.	No. 3	Per lb.
No. 2	3½d.	No. 4	5d.
	3½d.		11½d.

The manufacturers stated that sample No. 4, the hybrid from *C. ledgeriana* x *C. succirubra*, is one of the highest quinine-yielding barks they have examined, being fully equal to the finest Ledger bark from Java.

The results of this investigation show that these samples of cinchona bark from East Africa are all of good quality, and that the hybrid bark (No. 4) is exceptionally rich in quinine. There would be no difficulty in disposing of consignments of similar barks to quinine manufacturers at the prices given in this report, which are much higher than those ruling before the War, and represent about 2½d. per lb. for every unit per cent. of quinine sulphate yielded by the bark. The pre-war price was about 1d. per lb. per unit per cent. of quinine sulphate.

Under normal market conditions the *Cinchona succirubra* bark might be saleable for pharmaceutical use at a higher price than that quoted above, but recently there has been very little market for pharmaceutical bark.

1920 Report.—The manufacturers to whom the first samples of East African bark were submitted for valuation expressed a desire to purchase a shipment of the bark, and in 1919 a consignment was forwarded to the Imperial Institute by the Acting Administrator of German East Africa.

The consignment consisted of 52 bags of cinchona chips (net weight 61 cwt. 0 qr. 27½ lb.), which were apparently derived from *Cinchona succirubra*, and 1 bag of quills (net weight 60 lb.), which more resembled the *C. ledgeriana* type of bark.

Samples of the chips and quills were submitted to chemical examination at the Imperial Institute with the following results:—

	Chips.	Quills.
	Per cent.	Per cent.
Moisture	8·8	10·9
Total alkaloids	5·86	4·46
Including quinine*	1·81	3·39

It will be seen from these figures that the total alkaloid present in the quills amounted to 4·46 per cent., and was mainly quinine, whereas the chips contained 5·86 per cent. of total alkaloid, of which, however, only 1·81 per cent. was quinine.

The chips were purchased by the manufacturers at 5½d. per lb., and the quills at 11d. per lb.

	Chips.	Quills.
	Per cent.	Per cent.
* Equivalent to crystalline quinine sulphate ...	2·45	4·61

The consignment of chip bark contained less quinine and less total alkaloid than the sample of *C. succirubra* bark from German East Africa which was received at the Imperial Institute in 1918. The latter material yielded 3.39 per cent. of crystalline quinine sulphate compared with 2.45 per cent. from the present consignment.

The quills resembled the *C. ledgeriana* bark examined in 1918 in yielding about the same amounts of quinine and total alkaloid.

The results of the investigation confirm the view that cinchona bark of good quality can be grown in German East Africa, although the two samples of *C. succirubra* bark have shown variation in the amounts of total alkaloid and quinine present. It would, therefore, appear desirable to take steps to extend the plantations of the trees, particularly those of the *C. ledgeriana* type, with a view to the production of bark for British manufacturers.

(n) **Mineral Resources.**—An interesting report on the mineral resources of German East Africa (Tanganyika Territory) was published in the Bulletin of the Imperial Institute, Vol. XII, No. 4, October-December, 1914. The following account of the salient features of the country is extracted from this report:—

“Topographically and geologically, German East Africa has much in common with other parts of Eastern Africa. It is bounded seaward by a low-lying coastal plain, which is occupied largely at the surface by Tertiary and Mesozoic strata and covered in places by alluvium. This coastal plain is comparatively narrow in the north, but to the south of Bagamoyo it widens out considerably.

“The Tertiary, Cretaceous, and Jurassic strata of the coastal plain do not appear to have hitherto yielded minerals of any considerable commercial value, but they include beds of limestone, marl, and clay which will doubtless be found of value for local use in the manufacture of mortar and cement.

“The region west of the coastal plain, which forms part of the great central plateau highlands of Africa, is made up largely of ancient metamorphic rocks—gneisses and schists. Cutting the gneisses and schists, however, there are extensive intrusions of granite, with which are associated pegmatites and more basic intrusions of the diorite and diabase types. It is to these various intrusions that the more important of the economic mineral deposits of the Protectorate appear to owe their origin. Gold, mica, radio-active minerals, gem minerals, and various other features of economic interest deserve exploration in this upland region.

“Overlying the ancient gneisses and schists in various parts of the upland plateau, and occupying trough-fault depressions in them, are Karoo strata (Permo-Triassic), which are coal-bearing in some localities. The older rocks of the plateau highlands also

underlie the Jurassic and younger strata of the coastal belt, and indeed outcrop extensively in certain portions of the coastal districts.

“ Coal-bearing Karoo strata occur in the area surrounding the northern portion of Lake Nyasa. Moreover, the shales occurring in these Karoo strata are perhaps worth investigating to see if oil-shales occur amongst them.

“ In the Rift valley region, on and about the northern boundary of the Protectorate to the east of Victoria Nyanza, there is a considerable area occupied by volcanic rocks, including various alkali types, mostly rich in soda. Lake Natron is one of the soda lakes that occupy portions of the Rift Valley region. Like Lake Magadi, Lake Natron is rich in trona (sodium carbonate), which separates out from the waters of the lake in the form of a crystalline crust. Leucite-bearing rocks occur among the volcanic rocks of this area, and may be worth investigating as a commercial source of potash.

“ Volcanic rocks also cover the surface very extensively in the region to the north of Lake Nyasa.”

The principal economic minerals found in Tanganyika Territory are enumerated in the following translated report for 1913-14 of the Chemical Engineer attached to the Amani Institute, which is more up-to-date than the report published in the Bulletin of the Imperial Institute mentioned above:—

“ Mining is still very little developed in German East Africa. The oldest workings are the mica mines in the Uluguru Mountains, which date back to the time of Bornhardt. The plant and the methods of working are primitive and it is chiefly a question of working from hand to mouth. Mica of good quality (muscovite) has since been found in other mountains, notably in the West Usambara and Pare Hills; so far as I know, however, the only established mines are in the Uluguru Mountains (Morogoro).

“ In the pegmatite veins, which contain large books of mica, W. Schwarz has made the interesting discovery of pitchblend, samples of which were first examined in Amani by W. Schellmann and led to my visiting the spot. Unfortunately it appears that uranite is only present in small quantities and consequently can only be said to be of secondary importance. It is usually embedded in the edges of the mica ‘books,’ often also in quartz, particularly in the smaller crystals. It forms fine crystals of regular shape, cubic or octahedral, which are covered over with a thin yellow crust from exposure to the weather; these reach the size of a man’s fist and are very pure, that is to say they contain a high proportion of uranium. These ores are very strongly radio-active. Uranium is, I believe, still only won as a by-product.

“ An equally interesting find, which was made by A. Preusse in the pegmatite veins of the Uluguru Mountains, and a sample of which was sent to Amani, was a mineral similar to rutile

belonging to the euxenite group, containing 10 per cent. uranium and 14 per cent of rare earths (*cerium thorium*), 3 per cent. of which was thorium. So far, however, as is known here only one deposit of these ores, a sackful of which was collected, has been found. They also contain radium. The hope of coming upon tin in the course of mica mining has not yet been realised.

“ Graphite is found in various places in the Uluguru Mountains and also in other parts of the Colony. Actual lodes and veins have however not yet been discovered; the graphite appears chiefly in small crystal leaves, distributed in rock, particularly in gneiss usually alternating with biotite mica. In north Uluguru there are whole mountains of this formation. Whether its appearance in this form is valuable is questionable. The proportion of graphite found increases on working; the chief difficulty is its separation from the ‘leaves’ of mica. As, however, it has recently been reported from Madagascar that a similar find has been produced on a fairly large scale and that already considerable quantities of graphite have been exported, it seems desirable to ascertain the commercial value of the graphite gneiss of the Uluguru Mountains by sending samples to a suitable factory.

“ It may be mentioned that also in the neighbourhood of Handeni a rock containing graphite has been found, which is free from mica, and could be easily purified by a simple process of washing: the ratio of graphite found was 11 per cent.

“ Finally it may be added that asbestos was found last year in the course of mica mining in Uluguru.

“ Iron ores are distributed widely over German East Africa, but owing to the lack of coal and to transport difficulties, they have no commercial value. Iron pyrites are found everywhere in gneiss, but so far as is known at present never in large deposits and also not gold-bearing; ilmenite is very common specially in the Uluguru Mountains and abounds in large out-cropping clumps. Moreover the whole of the clay which has been separated from the gneiss by weather processes is full of still undecomposed ilmenite, which can be seen in black streaks in the water courses after rain. Valuable iron ores, in particular magnetic iron, have occasionally been found. The Matengo Mountains in Songea district, Mahenge and Engare Nairobi are the sites of a sand which is rich in magnetic iron (magnetite).

“ Copper ores have repeatedly been located in various parts of the Colony, but up to now never in a workable form. The best known finds have been at Ujiji, where principally malachite ore was found; the primary ore of this was found on examination at Amani to be cuprite. The finder, however, could only send in a few pieces the size of a man’s fist, in which there was found to be a proportion of 42 per cent. metallic copper.

“ Another important find was that made by Agricultural Inspector Besser in the district of Ubena, New Langenburg. The primary ore, which was more or less thickly covered with malachite, was discovered here to be copper glance (chalcocite)

some of the richer samples containing 49-56 per cent. of metallic copper. The geologists, however, on inspection declared that the find was not worth working. Copper ores were also found in Iringa district, in the Winza area of Mpapwa, and at Sindeni in the sub-district of Handeni; none of these has attained any importance, any more than the much acclaimed rich find at Tsavo in British East Africa.

“Cobalt and nickel have repeatedly been found by me, but only in traces, at first in the bed of streams which form the tributaries of the upper part of the Mgeta river in the Uluguru Mountains. On the same occasion a search for the primary bed proved fruitless. On the occasion of a later journey cobalt was traced in the sand of a stream of North Unguru. On subsequent occasions cobalt and nickel have several times been found in ore-bearing rock at the north end of West Usambara. The cause of these experiments was the receipt of a sample of salt deposit (which almost completely dissolved in water) consisting of sulphuric iron, which contained a proportionately large quantity of nickel and cobalt. The metal ore, out of which this had been decomposed by the weather, was not a lode, but consisted principally of pyrites (sulphur pyrites), contained in rock, also magnetic quartz which contained some copper and lead as well as cobalt and nickel. It appears out of the question that any value could be obtained from this discovery.

“Gold.—The best known gold deposits in German East Africa are the Kironda mines at Sekenke. No specimens, however, have been sent in from these workings or from the veins which have occasionally been worked at Speke Gulf in the Usinji district and at Ikoma. Apparently Ikoma is again to be worked on a small scale. Numerous samples of rock, usually quartz, were sent in in the hope of gold being found in them; in practically every case however the results were negative.

“Sometimes even mica was mistaken for gold. The so-called gold-bearing sands of Sigi and Mikulumuzi near Tanga, which caused a totally unjustifiable gold fever, belong to this category. Experiments conducted in Amani have shown that the much trumpeted claims as to their value are without foundation, and to-day hardly one of the then numerous prospecting fields exists. In this, as in many cases when samples are sent in, the wish was father to the thought; this is particularly the case when the sender believes that the sample contains tin, wolfram or vanadium (vanadin). Actually it is a piece of titanium, titanite or only hornblende.

“Mention should be made of samples of ferruginous quartz found on the Ukerewe Peninsula on Baumann Gulf (Lake Victoria); together with this a conglomerate was found similar to the Transvaal conglomerate. A report on the conglomerate was sent to Berlin and considerable quantities of samples were for-

warded; the samples proved of little value and an assay for gold made here proved negative. Part of the accompanying quartz, however, contained a small quantity of gold, about one-third gram to the ton.

“ Among other interesting mineral discoveries in the colony which were examined here the following may be mentioned:—

“ Braunite (Braunstein), which was found at Tandala in New Langenburg by the Missionary Wolf and considered for the purpose of fuel for the natives. An estimate of the ratio of manganese contained in it was not made as the deposits were more or less sporadic, and even if the quality were extremely fine, the costs of transport would have exceeded the value.

“ Officials and travellers have often mentioned that they have seen bitumen floating on Lake Tanganyika. In 1910 a sample sent by the Resident of Usumbura was examined in the chemical laboratory here; the melting point and solubility in benzoine and alcohol-aether, were determined and as a result this product was not classified as asphalt but as ozokerite, similar to the American products ‘gilsonite’ and ‘elaterite.’ A sample was distilled and the quantity of paraffin ascertained and separated. The origin of these blocks floating on the lake surface is unknown. It was formerly supposed that they came up from the bottom. More recent researches show that they drift towards the north end of Tanganyika and originate on the north-east bank. The Geologist, Dr. Reck, who has visited the neighbourhood states that the bitumen is brought down by rivers to the lake and that its origin may be in the Ufipa Mountains. So long as the origin is unknown, the question whether the discovery of oil is to be expected must remain unanswered.

“ Marble.—A white limestone powder was once sent in from the neighbourhood of Handeni with a view to its being used for lime-burning and was discovered to be marble in origin. As a result of this, excavations were made and large pieces of marble were found, either white with grey-black graphite veins or pure white, and with a very fine grain. Nothing has been heard since as to the extent of the deposit and the possibility of working it. Handeni is about 60 km. from Korogwe station (80 km. from Tanga) and connected with Korogwe by a non-macadamised motor road. A market might be found for this marble in Tanga, Dar-es-Salaam, Zanzibar and Mombasa for flooring, columns, tables, etc., in place of Dutch tiles or cement flooring. Dr. Reck reports that there appears to be a marble reef running from south to north from the Rufiji almost as far as the Pangani along the east side of Uluguru and Unguru Mountains, as white marble has also been found not far from the Central Railway east of Morogoro, the grain of which, however, is not so good as that of the Handeni marble. A sample sent from Maguguni at the eastern foot of the Uluguru Mountains of small pure dolomite crystals interspersed with graphite may be connected with this reef

" Precious Stones.—Various samples of what were taken to be diamonds or blue clay have been sent in; so far examination has always shown that the senders have been misled. Other precious stones have not been found in East Africa. The 'Luisenfelder' garnets in Lindi district are of no importance.

" Amethysts are found in small quantities in the Pare and Uluguru Mountains."

Mica.—Although but little information respecting the mica found in Tanganyika Territory is given in the above report, there is no doubt as to its quality and value. The mica consists of three varieties, viz., a greenish one resembling Madras mica; a brownish one—amber; and, lastly, a kind which equals in quality the best Indian ruby sorts.

The total amount of mica exported from German East Africa during 1912 was 154 tons, valued at £24,100, an increase of 55 tons and £6,700 as compared with the output in 1911. In 1913 the amount exported fell to 108½ tons, valued at £15,700, and in 1914 (to July 31st) to 45 tons valued at £6,800. Except for a small quantity exported to Zanzibar, all the mica was sent to Germany.

Early in 1917, it was decided to utilize for national purposes the mica deposits in German East Africa, and steps were taken in the first place to collect the old German stocks and then to commence mining operations in the Uluguru and Usambara Mountains, at Chala in Ufipa (formerly Bismarckburg) district, and in the area administered by Belgium. The Uluguru mines were worked by a Mica Board under the Military authorities until July, 1918, when a mica expert arrived from England, and the whole of the mica mines were taken over by the Civil Administration. 17 tons of mica were exported by the Mica Board, and up to March 31, 1920, when the mines were closed, 129 tons were exported by the Civil Administration, or a total of 146 tons in the three years. No details of the value have been received, but it is estimated that the total value was about £40,000.

Coal.—Carboniferous formation is found over a very large area of the south west part of Tanganyika Territory.

There is an outcrop of coal south of Manda (Wiedhafen) on Lake Nyasa, which is probably at a workable depth some distance up the Ruhuhu valley. East and south east of Mbamba Bay, also on Lake Nyasa, there appears to be about 100 sq. miles of carboniferous formation. The coal near the lake is said to be much broken, but it may be less disturbed further east near Tunduru.

Another coal deposit, which was examined by the German Government, lies between Lakes Tanganyika and Rukwa. A report, of which the following is a translation, was made on this deposit in 1915 :

" (a) Upper strata : A coal which, on account of it being above the surface, has suffered much from exposure to the weather, is

impure and flaky and of low value and poor quality. Thickness of the seam 106 centimetres containing 39 centimetres of coal.

“(b) Middle seam: A black *Fettkohle*, more or less flaky, comparatively lightly but still considerably impregnated with pyrites, which in certain places forms into *glanz* and *matt* coal. It burns with a long bright flame and gives a 19 to 24 per cent. deposit of ash, which melts to slack in the furnace. Thickness of the seam is 262 centimetres containing 160 centimetres of coal.

“(c) Lower seam: A brittle, streaky, but not flaky *Fettkohle*, forming thick deposits partly *glasglanz* or *fettglanz*, partly *matt* in appearance; it is black, comparatively heavy and rich in gas, adulterated, however, owing to its streakiness with a particular form of *glanz*, also with pyrites and crusts of nacrite. It burns with a long bright and very sooty flame, develops more heat than the coal in the middle seam, burns to a cake, and gives 24 to 28 per cent. deposit of ash, which melts to slack in the furnace. Thickness of seam 461 centimetres and 97 centimetres of coal.

“In spite of its greater proportion of ash, the coal in the lower seams is probably more valuable owing to its higher calorific value. In proportion to its volume it does not give a higher deposit of ash than the former, only the deposit is heavier owing to the large quantity of pyrites which it contains. In both of these coals the ash deposit is about one-third of the original volume.

“The coal in the lower seams also appears to possess the advantage that it can be made into coke.”

Samples of coal and soil collected from two shafts sunk by the Germans about 1910 near Tulo to the south of the Uluguru Hills were sent to South Africa for analysis in 1917. The following report was received from the Secretary for Mines and Industries:—

“The samples are as follows:—

I. Fine grained grey granulate.

II. Coarsely crystalline limestone containing silicates.

“These two rocks are such as occur in regions of very old and greatly metamorphosed sediments accompanied by granite and gneiss.

III. Limestone grit.

IV. Hard sandstone with calcareous fragments.

V. Hard grey shale with quartzitic laminae.

VI. Calcareous sandstone with coal adhering to it.

VII. Hard bright coal traversed by crystalline calcite.

VIII. Grey mudstone.

IX. Calcareous sandstone traversed, apparently at a considerable angle to the lamination planes, by a coal surface.

X. Hard and slightly gritty mudstone.

XI. Hard gritty calcareous sandstone.

XII. Hard flaggy shale.

“These ten samples might well come from beds which are the East African representatives of the Karoo formation. On

Hans Meyer's geological map of the country, which is the only one showing the geology of Uluguru Mountains, etc., known to me, Karoo beds are not marked as occurring at Tulo, though they are indicated a few miles to the north. This map was no doubt made on very imperfect information.

“ From the description and the appearance of the coal it seemed to me that it was another example of the fissure ‘ coal ’ found in the Karoo itself ; this is not a true coal, but an inspissated bitumen, the origin of which is still in doubt. The fact that the coal is seen only in one corner of the shaft put the idea in my mind, and it was strengthened by the appearance of the coal and by the occurrence of calcite veins in it, and also by the apparently oblique course of the coaly surface relatively to the bedding in the north. However, Mr. Gardthausen's analysis does not confirm this opinion ; for a characteristic of the fissure coals is their very low content of ash, except one or two instances which showed higher figures for ash, but in these cases there is room for doubt as to the freedom from vein-stuff of the samples taken for analysis.

“ The evidence in the shaft is not favourable to the existence of workable coal, but in such a little-known region further search is desirable in the neighbourhood of the shaft.

“ The figures obtained by Mr. Gardthausen are :—

 Volatile matter, 20.

 Fixed carbon, 65.

 Ash, 15.

“ These figures indicate a coal rather better than most of the coal used in the Transvaal, though the sample and the source are both too small to allow any stress being laid on the point.”

VI.—LAND TENURE.

(a) **General.**—The whole position of land in the Territory is somewhat complicated, owing to the fact that it involves three distinct systems of tenure or ownership which are antagonistic and mutually exclusive, though existing side by side. These may be described as (1) the ancient tribal system based upon a communal ownership, as established over a wide area of Africa ; (2) the purely private and individualistic Arab system, whereby the original alien immigrant possessed himself of a desirable piece of land without consideration for the possible rights of the State or the community ; and (3) the European system, under which Government grants of suitable properties were made to certain persons or companies after, at any rate nominal, consideration of the rights of the native community and the development of the country.

Of these, the first system naturally obtains over the greatest area, though it is generally restricted to the less developed or desirable parts of the territory. Working well under the former conditions which obtained before the African had come into contact with outside influence, it is now complicated by the problems

introduced by modern conditions; and this fact renders perpetual caution necessary if, on the one hand, native rights are to be maintained, and, on the other, due regard is to be paid to the adequate development of the large and often rich areas affected. The second, or Arab, system of ownership lends itself more readily to incorporation into the European scheme of private property in land, but it involves various complications in practice, the greatest being the fact that these estates were primarily intended for exploitation by slave labour. Once slavery ceases, the Arab owner tends to lose his powers of development, and his property falls into a neglected and unproductive state, with the inevitable result of eventual dispossession by the easy road of debt and mortgage. There is thus a constant danger that the former Arab owners (who, after all, were responsible for many useful innovations, and who did much to develop the Coast area in the past) may be expropriated by European or Indian successors who will exploit the properties on modern commercial lines, while the Arab and his ex-slaves sink apathetically into a hand-to-mouth existence under conditions distinctly opposed to social progress. It is no doubt true that these lands were originally seized in utter defiance of the rights of the original African communities; but it is scarcely possible to revive such considerations at this stage, while the Arab may be said to have justified his existence to a great extent by the many improvements which he introduced, to the general benefit of the country. The European system of land tenure was introduced by the late German Government, and large grants were made to individuals or companies, often with little or no consideration for the rights and requirements of the native population. As a result, considerable unrest was aroused, and such action must be considered a contributory cause to the numerous native risings with which the Germans had to deal. Restricted tribal lands meant a discontented and decreasing population, with labour shortage as a result; this entailed regulations to remedy the shortage by compulsion, with the inevitable outbreak as a logical conclusion. This was apparently recognised at last by the German Administration, who were in the last few years before the war consequently growing far more cautious in the matter of land grants; and, as previously stated,* they appear to have been trying in certain areas to remedy the harm already done, their policy having become more careful and far-sighted compared with their original methods. It is nevertheless undeniable that in many cases land has been alienated in utter disregard of native rights, and we are left in certain portions of the Territory with an unfortunate legacy in the shape of an overcrowded and discontented native community on the one hand, and with large and valuable properties handicapped for lack of sufficient labour, on the other.

From the point of view of immediate and practical considerations, we are at present struggling under the greatest difficulties in dealing with any privately-owned land, owing to the lack of

* See page 35.

numerous title deeds and records. While certain German documents of great value have been recovered, there is nevertheless a general absence of registers and plans essential for a proper handling of such an enormous problem as that presented by the former German properties throughout the country; and a great amount of work will be necessary before the survey of properties and scrutiny of alleged titles will have reached the stage where the possible tenant can feel that his right is clear and satisfactorily established. Meanwhile, the former enemy properties have to be dealt with as seems possible in each case, while the problem is also frequently complicated by the necessity of handling estates of such Arab or Swahili owners as may die. Some prompt action is essential in such cases, unless properties are to be allowed to fall into decay, while an increasing area of valuable land practically goes into Chancery. The land question in fact, must be regarded as one of urgency, and an immense amount of work will be required from the Legal, Land and Survey Departments before the matter can reach at all a satisfactory stage.

(b) **Land Laws.**—Very soon after their occupation of the country the Germans introduced, for application to non-natives, a system of land law based in the main on the general Prussian law on the subject. This appears to have been modified from time to time by local Ordinances that were consolidated by an Ordinance of November 21st, 1902, which was in force at the outbreak of war.

Subject to the rights of private persons or of chiefs or native communities, all unowned land was declared to be Crown land, and the ownership of it was declared to be vested in the Empire. Such Crown land could be granted by the Governor either by way of transfer of ownership or by lease, but before any such grant could be made it was necessary to ascertain that the land was in fact free from claims of third parties and unoccupied, and for this purpose a system of Land Commissions was established, whose duty it was to enquire on the spot as to whether any particular piece of land which had been applied for was in fact free to be disposed of by the Government.

The Governor had wide powers as to imposing conditions on making any grant of land, and it was particularly provided that in the neighbourhood of native settlements areas, sufficient to ensure the subsistence and other needs of the native population, were to be reserved. In addition there might be a reservation of all minerals, of adequate areas for public purposes, particularly forest land, and a right to resume land required for roads, railways, canals, &c., upon payment of compensation.

Originally all agreements for the transfer of the ownership of land or of leasehold interests where the lease exceeded 15 years were subject to the sanction of the Governor. Such an interference with the rights of private property did not, however, long survive, and an Imperial Ordinance of November 26th, 1895, laid down that this sanction was not required in the case of land owned by a non-native. Transfer of lands by natives to non-natives still remains subject to such sanction up to the present time.

Together with and as part of the general Prussian law, the Germans introduced their system of Registration of Title in a *Grundbuch*. Registration in the *Grundbuch* assured an indefeasible title, but before such registration could take place surveys and other matters had to be carried out. Owing, apparently, to practical difficulties, relatively little progress was made, and *Grundbücher* were established only for Dar-es-Salaam, Tanga and Tabora. In some other districts *Land Registers* were established and were available for non-natives, but they appear to have existed for purposes of record only and as a preliminary to the establishment of a *Grundbuch*. Entry in a *Land Register* was less formal and carried no assurance of an indefeasible title.

It is now proposed to substitute the *Torrens system* for the German *Grundbücher* and *Land Registers*.

VII.—ENEMY PROPERTY.

A Custodian of Enemy Property was appointed in March, 1917, to control, protect and conserve the assets of all enemy subjects and corporations within the Territory. The whole of the enemy property in the Northern Area was vested in the Custodian by Proclamation No. 5, of May 26, 1917. This Proclamation was subsequently extended to include the Central and Southern Areas which had hitherto remained under military jurisdiction.

As the British Forces advanced from the North, in 1916, enemy produce was collected by a Controller of Enemy Merchandise appointed by the military authorities, and stocks of cotton, rubber, sisal and coffee were accumulated. The Department of the Controller of Enemy Merchandise was absorbed in the Department of the Custodian of Enemy Property in July, 1917. Strenuous efforts were made to secure shipping for the produce, but this was found to be extremely difficult owing to the urgent military requirements for shipping then existing. As a consequence considerable deterioration of the stocks ensued. Some stocks were disposed of locally, and the balance gradually despatched to the London market where satisfactory prices were obtained.

An Inspector of Plantations and two Assistants were appointed shortly after the establishment of the Department. With a view to the conservation of the estates and the buildings, machinery, &c., thereon, efforts were at once made to lease temporarily such estates as were workable, and to arrange for caretakers to be placed in charge of the others. In cases where the enemy owners or their agents had remained on the estates, they were permitted to reside on and manage the estates subject to the financial and general control of the Custodian.

The principal industry of the Northern Area was the cultivation of Sisal. The leases of these estates were thrown open to public tender, and although quite satisfactory rents were obtained, it is to be regretted that owing to the uncertainty of the period of tenure and the heavy demand on the British

population of the neighbouring Protectorates for military operations, the majority of the lessees were aliens. Every lease contained a proviso that the tenant should clean and replant an area equal to that from which sisal was cut, with the result that not only was there a satisfactory output of sisal, whilst a considerable income was credited to the estate accounts, but the productivity of the estates was maintained. The difficulties in obtaining shipping very seriously affected the lessees of the sisal estates, and led to a great congestion of sisal in the Tanga stores which continued for a period of two years.

Whenever funds were available they were utilised to maintain and keep clean as far as possible the Coffee and Coconut estates.

The leasing of the plantations in the Central and Southern Areas was severely handicapped by military operations and by the lengthy period during which they had been neglected. Consequently little could be done beyond conserving such assets as remained and collecting such produce as was found thereon. It was found possible later on to grant a number of leases of considerable areas, for seasons only, for the cultivation of cotton, and these areas yielded to the tenants highly satisfactory results. It is proposed to continue this policy until the properties are disposed of. The Inspector of Plantations and his assistants have paid frequent visits to the various accessible plantations and have supervised the operations of the lessees.

As business premises and houses in the townships were vacated by the Military units, tenants on temporary leases were found for them at reasonable rentals. The enemy buildings generally are of sound and substantial construction and will form a very valuable asset in the Territory in the future.

Disposal of Enemy Property.—(a) *Movable.* Stocks of trade goods belonging to the various commercial houses were found on occupation to be very low. These were disposed of by public auction. All furniture found a ready sale as the articles were essential to the community.

(b) *Immovable.* No steps could be taken to deal with this class of property until the fate of the Colony was determined by the Treaty of Peace. Steps are now (December, 1920) in train to effect its disposal by public auction, but some delay must necessarily occur owing to the absence in many cases of the official German titles and ownership records.

Enemy Subjects. Up to the time of their repatriation all enemy subjects were dealt with by the Department with every courtesy, and their reasonable wishes as regards their property and affairs were complied with. Where funds were available, and necessity arose, advances were made for their maintenance.

Claims. The Custodian was made responsible for the collection of claims by British subjects and British protected persons against enemy Governments or nationals, and these were registered and forwarded to the proper authorities in London.

Accounts. The following statement shows the total collections and disbursements of the Department for the three years ended March 31st, 1920. All incoming funds have been placed to the credit of the Treasury of the Administration of the Territory and the surplus remains under its control.

Collections.		Disbursements.		Balance in hand, March 31, 1920.		Total Departmental Expenses.		Percentage of Expenses to Collections.
Rs.	Cts.	Rs.	Cts.	Rs.	Cts.	Rs.	Cts.	Per cent.
10,875,735	00	2,798,028	79	8,077,706	21	212,995	00	1·96

VIII.—JUDICIAL AND LEGISLATION.

During the period of military operations such legislation as was considered necessary was enacted by Proclamations and Regulations promulgated by the Commander-in-Chief, and, on the establishment of the Civil Administration, a similar procedure was followed by the Administrator with respect to that part of the Territory which came under his control. Up to the time of the Armistice various Proclamations were issued, one of the most important of which placed the Customs laws on the same lines as those in force in the East Africa Protectorate, while another vested in the Custodian of Enemy Property all property, rights and interests belonging to enemy subjects, and empowered him to take measures for their protection and preservation. The numerous other Proclamations and Regulations related to matters of an emergency and temporary nature, or made substitution on British administrative lines for certain local German Ordinances.

The administration of justice was carried on under powers conferred on Political Officers by a military Proclamation dated the 9th October, 1916. This was rendered necessary by the fact that all German officials had left the Occupied Territory, and no one, with the exception of native chiefs, &c., was left who could deal with such cases as might arise. During the year 1918, it became obvious that it was desirable to set up a definite standard of criminal law and procedure both as a guide for those officers, and with a view to laying the foundation of the system which would be permanently adopted. For this purpose the Indian Penal and Criminal Procedure Codes appeared to be the best suited to local conditions, and the approval of the Secretary of State to their adoption was obtained. Accordingly, as soon as possible after the Armistice, a Proclamation, No. 4, of 1919, was issued making provision for the constitution and jurisdiction of Courts and making the Indian Codes the standard of criminal law throughout the Territory. In order to obtain greater elasticity in the treatment of natives it was provided that the application of the Indian Codes should be limited by their suitability to the circumstances of the moment and that all Courts should also be guided by and have regard to native law and custom

in so far as it was not repugnant to justice or morality. All sentences which exceeded 12 months in the case of District Political Officers and six months in the case of Assistant Political Officers were made subject to confirmation or revision by the Administrator, to whom any person aggrieved might appeal. During the year 1919, 9,003 cases were heard by the Political Officers, of which 389 were submitted for confirmation.

Civil jurisdiction in cases between natives of Africa only was also conferred on Political Officers, but so far as other persons were concerned no civil Courts having jurisdiction over them were established prior to the Order in Council, 1920. In spite of the complaints of certain members of the Indian and other trading communities, the absence of civil Courts has in many ways proved advantageous in checking a tendency to wild speculation and in reducing the credits at high rates of interest by means of which small traders not infrequently endeavour to take advantage of the native.

Other legislation during the period included much that was designed merely to meet particular contingencies arising out of the abnormal situation. For example, it was at one time found necessary to check profiteering by a Proclamation for the Control of prices of foodstuffs and certain other articles, while questions relating to currency and the transition through which the currency of this territory has passed necessitated a series of Proclamations, many of which have since become obsolete and are being replaced. The repatriation to Germany and return to Tanganyika, and, where necessary, the deportation, of former enemy aliens, together with provision for the disposal of their property, in accordance with the terms of the Treaty of Peace, has also been dealt with in Proclamations as occasion arose.

But in addition to the temporary and emergency legislation which has been put in force steps have been taken to make provision for what will doubtless form part of the permanent law of the Territory. The retention of the general German law which was in force at the outbreak of war was clearly impracticable and undesirable, and the tendency of legislation has been, and is, towards bringing the laws of this Territory into line with those of the adjoining Colony and Protectorates. With this in view it was proposed to apply a certain number of the Indian Acts until such time as the necessary Ordinances could be enacted. This proposal has been approved and the Territory will thus be provided with a body of substantive law which, with the supplement of local legislation, will be an effective substitute for the former German laws. With such local legislation considerable progress has already been made. Thus, provision has been made for the establishment and discipline of a Police Force, for the regulation of the sale of liquor, for the restriction of immigration, and for the prevention of diseases of animals. Proposals for a Mining Ordinance have been submitted to, and approved by, the Secretary of State, and questions of Public Health have been dealt

with in various Regulations and in Proclamations providing for the registration of medical practitioners, the restriction of the use of opium, and the regulation of the sale of drugs and poisons. An Ordinance for the prevention of infectious diseases has recently been enacted, and an Ordinance providing for the delimitation and control of townships is under discussion.

Questions relating to land legislation present some difficulty owing to the difference between the English and German systems of ownership, but a proposal to adopt some form of the Torrens system of registration of title has been approved and the necessary legislation is being considered.

A proposed Ordinance giving the Governor power to make regulations for the control of the cultivation and sale of cotton, and another providing for the imposition of Stamp Duties, have reached an advanced stage and should shortly be enacted; while other measures dealing with the exercise of authority by native chiefs, the control of the trade in firearms, and the registration of native vessels have been submitted to the Secretary of State.

An Ordinance providing for the establishment and organisation of Courts subordinate to the High Court has been approved. It is anticipated that this Ordinance together with the appointments of Judges and Magistrates, which have been already made, will make possible the normal exercise of civil jurisdiction at an early date. It has not, of course, been possible to deal with every question which has arisen, or to issue a new law on every subject, but a beginning has been made and the general lines have been laid down, so that what remains is largely a matter of time.

IX.—POLICE AND PRISONS.

(a) **General.**—The police system of the Germans had of course been entirely broken up and dispersed as a result of war, and one of the first steps to be taken by the provisional administration at the end of 1916 was the formation of a civil police force for the maintenance of order in the area taken over from military control. In September of that year General Smuts had brought from South Africa 28 members of the South African Mounted Rifles intending to utilise them as European police in the districts where Europeans—chiefly interned Germans—were settled.

At the outset, British Administrative Officers, being naturally without any close acquaintance with the districts under their charge, had been compelled to re-enlist as policemen who had served the Germans in that capacity, since their local knowledge of both country and inhabitants was indispensable. These were supplemented by raw recruits whose knowledge of police duties was drawn chiefly from their own past experience, as villagers, of the predatory habits of former policemen. Apparently with the object of asserting police authority and enforcing obedience,

if not respect, the Germans had permitted their native police to exercise a very wide licence in the performance of their duties, and the policeman, especially on detached duty, regarded it as his natural right to extort from villagers by threats or force anything that he might require, either in service or in goods, and there is evidence that brutalities were not infrequent.

In order to stamp out this conception the European force was split up, and at each station the native police were placed under the direct supervision and control of a police officer. The undesirable ex-German constable and many unsuitable recruits were by degrees weeded out, and a better tone introduced, although in some cases stern examples were necessary to convince the men that a British Administration would not tolerate such practices as the looting of natives, the extortion of bribes, or the torturing of prisoners and witnesses. Much attention has been paid to training, discipline, and duty, and the result of four years' effort has effected such a marked improvement in the native ranks as promises well for the future of the Force.

The Police Force of the Tanganyika Territory, in which is incorporated the Prisons Service, is placed under the direction and control of the Commissioner of Police and Prisons, whose powers are prescribed by Proclamation No. 6 of 1919. The Commissioner is assisted in his duties by an Assistant Commissioner, and all powers granted to, and imposed upon, the Commissioner, may, during his absence, be performed by the Assistant Commissioner. A Police Administrative area is termed a Police District, and is under the management of a District Superintendent, who has, in large Districts, one or more assistants according to area, population and local conditions. The Headquarter Office of the Force is at Dar-es-Salaam.

The Immigration Department, with Headquarters at Dar-es-Salaam, and an Immigration Office at each of the ports of entry, is under the control of the Commissioner of Police; the Officers of the Force are also Immigration Officers.

The Water Police, with Headquarters at Dar-es-Salaam, and detachments at coastal stations, is a unit of the Regular Police Force.

The following is a comparison of the constitution of the whole force in November, 1918, and November, 1920 :—

EUROPEAN RANKS.

1918.				1920.			
Commissioner	...	...	1	Commissioner	...	...	1
Assistant Commissioner	...	...	1	Assistant Commissioner	...	...	1
District Superintendents	...	...	4	District Superintendents	...	...	5
Assistant District Superintendents.	...	...	6	Assistant District Superintendents.	...	...	9
				Pay and Quartermaster	...	...	1
Inspectors	...	...	13	Inspectors	...	...	16
Assistant Inspectors	...	...	17	Assistant Inspectors	...	...	17
				Sergeant Instructors	...	...	2
Troopers	...	...	23	Troopers	...	...	29

ASIATIC RANKS.

1918.				1920.			
				Sub-Inspectors, 1st Grade	...	...	4
				Sub-Inspectors, 2nd Grade	...	...	7
				Assistant Sub-Inspectors	...	...	6
Clerks	...	...	3	Clerks	...	...	10

NATIVE RANKS.

Police.

Sergeant-Majors	...	...	4	Sergeant-Majors	...	...	6
Sergeants	...	...	59	Sergeants	...	...	68
Corporals	...	...	102	Corporals	...	...	127
Constables	...	...	1,298	Constables	...	...	1,591

Prisons.

Chief Warders	...	...	12	Chief Warders	...	...	12
Head Warders	...	...	41	Head Warders	...	...	50
Warders	...	...	207	Warders	...	...	260
				Wardresses	...	...	7

A training depot with accommodation for 100 recruits is in course of establishment at Morogoro, where recruits will be instructed in drill, elementary law and police duties, prior to being posted to districts. The value of such a depot cannot be over-estimated.

The general health of the Force has been as satisfactory as could be expected. Climatic conditions in many parts of the Territory are most trying and malarial fever is very prevalent. This disease has been responsible for 188 admissions to hospital apart from the numerous less serious cases treated outside the hospitals. The death of 57 members of the Force has to be recorded.

The following table gives a summary of work performed by the whole Force during the period under review (1918-20) :—

Number of cases reported to the police	...	...	...	24,324
Number of cases sent for trial under arrest, bail, summons, etc.	...	...	...	20,811
Total number of persons convicted	...	...	...	18,842
Total number of persons discharged	...	...	...	1,725
Total value of property reported lost or stolen	...	...	...	Rs. 265,274
Total value of property recovered	...	...	...	Rs. 89,143

The number of persons found on arrest to be old offenders was about 20 per cent. of the total persons arrested.

The Force has been called upon to perform many duties which may be termed extraneous: the following table shows a number of the duties undertaken:—

...	Immigration Officers.	...
...	Pound Masters.	...
...	Stock Disease Guards.	...
...	Prosecutors.	...
...	Messengers of the Court.	...
...	Issuers of Criminal Process.	...
...	Court Interpreters.	...
...	Clerks of the Court.	...
...	Customs Officers.	...

During the War the Police also garrisoned the various stations in the areas handed over by the Military Authorities to the Civil Administration. It is perhaps of interest to mention that when the German column under Major Naumann crossed the Central Railway in June, 1917, the garrison at Mkalama, which consisted of one Assistant Inspector of Police and 19 rank and file under the District Political Officer, successfully resisted attack for two days until relieved. The total casualties amongst the Police Force during the fighting which ensued in the Mwanza, Arusha, Moshi and Konda-Irangi Districts was 44, as follows:— Killed 16, missing (believed killed) 8, wounded 6, captured 14.

(b) **Crime.**—At the time of the conclusion of the Armistice the Police Force was called upon to deal with the common epidemic of serious crime which in every country is one of the sequelæ of active military operations. The records of the Criminal Courts point to the fact that many of the worst offenders were natives foreign to the Territory whose presence was directly attributable to the War. Brought to the country as camp followers, or for military service of one form or another, they were left behind by their quondam masters on demobilisation of the various military Units, and being unable or unwilling to obtain employment, they lapsed into crime. With many the desire to return to their homes was frustrated by their destitute state, whilst others willingly embarked upon an existence under conditions which provided ready scope for the exercise of their criminal instincts. Crimes of violence, housebreaking, and theft and kindred offences, generally the work of the most daring members of the criminal classes, were rife, and were stimulated by the presence in every important centre of a liberal sprinkling of the criminal receiver class. The native has proved himself an adept in the art of performing a successful burglary, and his aptitude for adopting daring and artful methods has been strikingly illustrated.

The repatriation to their countries of origin of destitute natives, flotsam of the military operations, whether convicted or otherwise, has for some time engaged the successful attention of the police, thereby furnishing a means of ridding the Territory of a considerable proportion of its most undesirable "foreign" criminal element. It is satisfactory to note that at most centres a marked decrease in serious crime has already been revealed, and that in certain districts the number of admissions to prison has fallen by 35 per cent.

(c) **Criminal Investigation Department.**—The organisation of a Detective Branch of the Force is now receiving attention. It is proposed to adopt the decentralised system to utilise members of the regular Force for general detective work, keeping at Police Headquarters a limited number of specially trained detectives for particular tasks. This system will provide machinery to enable a detective despatched from Headquarters to assume control of any grave cases where his presence may be thought necessary. Detectives trained under this plan are more likely to develop into useful all-round men.

Provision has been made for the introduction of the Finger Print System used so extensively by the Police Forces of the Empire.

(d) **Reorganization.**—The reorganization of the Force on permanent lines is proceeding with satisfactory results. In the peculiar conditions of 1916-17 the initial composition and administration, for reasons already set forth, necessarily presented great difficulty. The later reorganization follows closely the system in force in the neighbouring Kenya Colony, but with the notable exceptions that the rank of trooper (European constable) is to be abolished, and a principle of promotion from the subordinate European ranks to the superior ranks will be observed as an incentive to continuous good service. Nowhere in the Tanganyika Territory do conditions necessitate the employment of Europeans in the ordinary duties of town police, and it is considered unlikely that white constables will be essential to the Force for a good many years to come. The main function of the European personnel is the training and supervision of the native ranks. It is hoped in the future to engage in the ranks of Inspector and Assistant Inspector a superior type of non-commissioned officer who may eventually qualify to fill vacancies in the ranks of Superintendent and Assistant Superintendent.

X.—COMMUNICATIONS.

(a) **Railways.**—Three one-meter gauge single-line railways form the system at present known as the Tanganyika Railways.

(1) *The Tanga Railway.*—The northern line, known as the Tanga Railway, which connects the port of Tanga with New Moshi, has a total length of 351·7 kilometres. The first 150 kilometres of the line serve the rich district of the Usambara Mountains and their foot-hills. Then follow 180 kilometres through arid country along the foot of the Pare Mountains, and the last 20 kilometres belong to the fertile region of the lower slopes of Kilimanjaro. The steepest grade is 1 in 40 both ways, and the sharpest curve has a radius of 300 metres. The rails are 33 lb., 42 lb. and 50 lb. per lineal yard in 9 and 10 metre lengths and are laid on steel sleepers. The relaying of the light rail section from Tanga to Mombo will have to be considered in the near future.

(2) *The Voi-Kahe Railway.*—This line leaves the Tanga Railway 20 kilometres east of Moshi. It was built by the British troops during the War to connect the Uganda and Tanga Railways. From the junction with the Tanga Railway the line runs in an easterly direction to Voi Camp Station (12 kilometres from Voi), where it joins the Uganda Railway. The total length of the line is 149 kilometres, and it lies almost entirely within Kenya Colony. It has the characteristics of a military railway and was built for purposes differing largely from the purposes

for which it is now used, namely, ordinary open line traffic working on a commercial basis.

(3) *The Central Railway*.—This is the main trunk line which connects the port of Dar-es-Salaam on the Indian Ocean with Lake Tanganyika (terminus Kigoma), and so with the eastern part of the Congo Basin. It is 1,244 kilometres long. Much of this railway, which, on the whole, follows the line of least resistance, runs through barren and sparsely populated country, but its central position should facilitate the collection of traffic from the more fertile and thickly populated districts by the construction of feeder lines on either side.

The Central Railway is well surveyed and substantially built. The permanent way, with the exception of about 150 kilometres between Dar-es-Salaam and Morogoro, consists of 56 lb. rails on heavy steel sleepers and is therefore of the heaviest type used on metre gauge railways for ordinary traffic. The rails from Dar-es-Salaam to Morogoro are 42 lb. per lineal yard. The steepest grade is 1 in 50, and the sharpest curve of 300 metres radius. The line reached Kigoma early in 1914, but much work in connection with the extension yards and wharves in the last section remained incomplete.

From Dar-es-Salaam to kilometre 1,000 the railway is under British administration: thence to Kigoma it is temporarily worked by the Belgians.

A short line (six kilometres long) branches from the main line at Ngeta, 65 kilometres from Dar-es-Salaam, and serves a quarry.

In addition to the metre gauge lines, the following methods of transport exist:

(4) *The Sigi Railway*.—This is a narrow gauge line (75 centimetres), 23 kilometres in length, which, starting from Tengeri Station at kilometre 44 on the Tanga Railway, runs through the foot-hills of Eastern Usambara to Sigi, where it serves a saw mill. The steepest grade is 1 in 18, and the sharpest curve has a radius of 30 metres. Rails of 15 lb. per yard are used for the first 17 kilometres and 25 lb. per yard for the remaining 6 kilometres. Passengers can be carried in timber trucks when accommodation is available. Only two small girder bridges were destroyed by the Germans and these were rebuilt at a cost of about £500.

(5) *The Shume Rope Way*.—This is nine kilometres long and leads from Mkumbara station on the Northern Railway up the steep cliff of western Usambara, where it taps the rich timber district of the Shume Forest. This line, which is private property, was partly dismantled by the Germans, but no real damage was done. It is not at present in use.

(6) *The Lindi Line*.—This narrow gauge line (60 centimetres) originally ran from Mingoyo to Mtua (about 18 miles). During the War the following extensions were made: (1) $4\frac{1}{2}$ miles towards Lindi from Mingoyo, and (2) from Mtua through 'Ntanda to

Masasi, making a total length of about 85 miles. The rails used vary between 12 and 20 lb. to the yard. The steepest grade is 1 in 50 up from the coast and 1 in 33 down to the coast. The sharpest curve has a radius of 150 feet. This line runs through a rich and well populated country and might become a paying proposition. At present it is not in use, but the track is there, and there are sufficient locomotives, tractors and wagons to run a useful service if the line were repaired.

The following railways were projected by the Germans :*

(1) *From Moshi to Arusha.*—This line was surveyed by the Germans, and some 20 miles of rails were laid by the British Force in 1917 from a point about 6 miles East of Moshi towards Arusha. The line was subsequently removed, but the earthwork still remains in part.

(2) *Tabora to Kagera Elbow.*—In 1914 the Germans had commenced work on this line, which ran in a Northerly direction from Tabora and was designed to open up the Ruanda and Urundi districts, and also probably later to connect up with Mwanza on Lake Victoria Nyanza. The formation was completed for about 150 kilometres, and 40 kilometres of permanent way had been laid at the time of occupation. 29 kilometres of this line were picked up in 1917, the rails being handed over to the Belgians for their Congo Railway and the sleepers stacked at Tabora. A short branch of 11 kilometres into a fuel area North of Tabora remains.

Destruction and Repairs.—When driven south in 1916 the Germans did a considerable amount of damage to both railways. On the Tanga Railway all major bridges, 10 in number, with aggregate spans of 260 m., and 23 minor bridges, with aggregate spans of 160 m., were blown up; most of the high service tanks, pumps and other watering arrangements along the line were destroyed; 30 miles of track were removed entirely; and 60 sets of points and crossings damaged. On the Central Railway most of the damage took place on the first two sections (between Dar-es-Salaam and Dodoma). 92 major bridges, with aggregate spans of 2,200 m., and 14 minor bridges, with aggregate spans of 65 m., were blown up; 100 sets of points and crossings were destroyed; and many watering stations damaged. Temporary repairs were, however, soon effected. The Tanga line was re-opened for through traffic in August, 1916, whilst the Central Railway was again being worked in February, 1917. Permanent repairs have since been taken in hand and will be completed on both railways in 1921 or 1922.

The estimated damage done to the two railways is as follows :—

<i>Tanga Railway.</i>					Rs.
1. Engines and rolling stock	...	...	...	...	1,183,350
2. Plant (workshop, etc.)	...	...	...	...	40,500
3. Water supplies	...	...	...	...	67,500
4. Bridges	...	...	...	...	268,050
5. Track	...	...	...	...	636,000
Total ...					Rs. 2,195,400

* For fuller particulars see *German Plans for Railway Development in East Africa*, published in *The Geographical Journal*, November, 1918.

<i>Central Railway.</i>	<i>Rs.</i>
1. Masonry and steel work of bridges	1,028,156
2. Points and crossings	65,450
3. Locomotives	970,740
4. Passenger stock	126,075
5. Goods stock	429,360
6. Contractor Holzmann's stock	161,100
7. Motor and hand trollies	75,000
8. Workshop machinery	22,000
9. Watering arrangements	35,700
10. Telegraph instruments and station equipment ...	10,000
11. Buildings	10,500
12. Track	12,500
Total ...	Rs. 2,946,581

Maintenance and Renewal of Permanent Way.—During 1919 and 1920, the track and road have generally been maintained in good order, but there remain large stretches, especially in the wet regions near the coast, where the long continued neglect during the War is still noticeable. Fortunately, the excellent design and quality of much of the permanent way has counteracted the effects of this neglect considerably. With the exception of the Voi Line, which is not ballasted, night running has been possible on both main lines.

Although about 25,000 cubic metres of stone ballast was put on the lines, the ballast in many places is not up to standard. The new ballast consists of broken stone, chiefly granite and gneiss, and most of it was obtained from old German dumps.

Banks have been made up, and side drains of cuttings cleaned to a large extent. In the more arid regions inland very good progress has been made, but the banks in the coastal region are still in an unsatisfactory condition.

The treacherous marl formation between kilometres 20 and 40 on the Central Railway, on which several large slips occurred during the War, has given no further trouble.

Most of the black cotton-soil banks are provided with a blanket of sandy soil, and though they are by no means steady, they offer no cause for anxiety; the only exception being a high bank (about 2 to 3 metres) through the Ruvu Swamp (from kilometre 82 to 84 on the Central Railway), on which maintenance is exceedingly difficult.

No regradings were undertaken.

Much clearing and bushing remains to be done as the bush was allowed to grow freely during the War. On most of the sharper curves, however, sufficient bush has been cleared to allow of a clear sight, and the telegraph lines have been kept open.

Washouts and Floods.—Early in April, 1919, and again at the end of March, 1920, the Buiko-Lembeni section of the Northern Railway, and 48 kilometres of the Voi-Kahe line, were subject to floods, resulting in a few major and a large number of minor breaches and washouts. Most of these, however, did little damage. These sudden floods are due to cloudbursts in the

mountains adjoining the dry and desert-like plains and are likely to occur regularly at the beginning of each rainy season. As the banks are generally low, serious damage or prolonged delay to traffic on the main line need not be anticipated. But if the Voi-Kahe line is to be kept open, a large number of culverts under the high banks will have to be built to avoid long delays to traffic.

A very serious flood occurred towards the end of April, 1919, just west of Kidete Station on the Central Railway.

Station Buildings and Staff Quarters.—Only the most necessary repairs and improvements to buildings have been carried out owing to shortage of funds. Very much still remains to be done to overhaul thoroughly the buildings and quarters which, though substantially built, have suffered much through six years of neglect under war conditions. The increased cost of materials and the lack of skilled supervision have been greatly felt.

The state of the quarters for the Asiatic clerical staff and artisans, as well as for the African permanent labour, is far from satisfactory, although everything possible has been done within the narrow limits of the available funds. The question of permanent structures to take the place of daub and wattle will soon become very urgent.

Bridges and Culverts.—Bridges and culverts have been maintained in good repair. At many places new flooring and pitching had to be provided. A considerable amount of painting of steel work has been done.

In addition to ordinary maintenance repairs good progress has been made with constructing bridges and viaducts which had been blown up and partly or wholly destroyed by the retreating enemy in 1916.

On the Northern Railway permanent repairs still outstanding to a few bridges were postponed as the temporary structures in the road at present were considered sufficiently sound to last for another year.

Locomotives.—There are two types of standard locomotives on the Central Railway, the German goods 2-8-0 type and the G. Class 4-8-0 type, both with bogie tenders, that are able to take the maximum load of 16 four-wheeled units over all sections. The German tanks have less tractive effort and less boiler capacity and are only suitable on the plateau stretching east and west of Tabora. It is considered that one booked train each way per day between Dar-es-Salaam and Tabora can be worked by the present locomotive stock. As regards the probable life of the present stock, it is estimated that the German goods engines have a further 12 years service, the G. Class 15 years, and the German tank engines 10 years. New engines will not be required unless the traffic increases to more than one train per day in each direction between Dar-es-Salaam and Tabora, in addition to fuel trains, construction trains, and other departmental traffic.

The principal type of locomotive on the Tanga line is the F. Class of which there are 12, but they are of an obsolete type and after deducting three which are unfit for further service, there are 9 of this class which on the average are not fit for more than 3 years service. It is thought that within 3 years probably 4 new engines will be required, and the 4-8-0 G. Class is recommended as being a standard type and more powerful. The three German goods 2-8-0 type on this line and the two German Tanks 2-8-0 type are useful engines and have about 15 and 8 years service respectively; with the exception of the two last-mentioned classes, none of the engines at present on the Tanga Line can cope with a full traffic load, and as the small engines are stationed at Tanga on account of the light section rail, the load out of Tanga is limited to 8 vehicles.

Fuel.—The consumption of wood fuel for locomotives per engine kilometre is 4.17 cubic feet for the Central Line and 2.56 cubic feet for the Tanga Line. The supply of wood is maintained by contracts which are let out to public tender, the average price during the year being Rs. 4/75 per 100 cubic feet of wood. The price of the wood at the line varies with the distance it has to be brought from the place of cutting, and in some places portable narrow gauge tramways are laid to convey the wood to the line side, where it is stacked. In some places the wood is so scarce that it has to be railed considerable distances to where it is required, thus increasing the cost. The damage to sides, roofs, floors, etc., of wooden vehicles through sparks is somewhat heavy, and experiments are being made to improve the existing type of spark arrester.

Carriages and Wagons.—The total number of vehicles on the Central Railway is 465, and on the Tanga Railway (including the Voi-Kabe Railway) 334. The number that passed through the carriage and wagon repair shops at Tabora, Dar-es-Salaam and Tanga amounted to 620, of which 30 were completely rebuilt, 400 underwent heavy repair, and 190 light repair.

Careful attention was paid to the repair and maintenance of the vacuum brake, many vehicles being completely fitted and others fitted with piping only. In the Tabora shops the difficulty of fitting vehicles with the brake, and maintaining those already fitted, is increased owing to the lack of inspection pits.

There is a considerable shortage of rolling stock, particularly on the Tanga line, and there are no vans proof against the tsetse fly, in which valuable livestock can be conveyed.

Workshop Section.—The work in the erecting shops at Tabora, Dar-es-Salaam and Tanga was heavy throughout the year. The number of engines that can be accommodated at the same time is, in the Tabora shops, five, in the Dar-es-Salaam shops, two, and in the Tanga shops, three.

The engine pits are commodious, and of good design generally, but the apparatus used by the Germans for the purpose of lifting

engines—a girdered screw-jack arrangement—absorbs a great deal more time than would be the case if overhead cranes were provided.

Traffic.—Conditions were very much more those of construction lines than open lines; and there is a marked shortage of suitable stock and warehouse accommodation.

The Central Line is disappointing in the matter of present traffic and in the outlook for the near future. Early in the year the railway conveyed a considerable amount of what may be termed fictitious traffic, that is traffic which will probably not appear again, *e.g.*, army stores for the Salvage Commission, famine relief food, and accumulations of passengers and goods held up during the War. The principal articles upon which the railway will have to rely for revenue will be hides and skins, local grain and meal, cotton, sisal, cattle, ghee, wax, provisions, piece-goods and perhaps mica. It is to be hoped that things will improve under more settled conditions, and when plantations open out, but no great increase is to be expected until more shipping is available and produce and money markets become steadier. There is a considerable quantity of sisal up country waiting for ships, and possibly, some improvement in the rate of exchange.

Two special factors affected traffic adversely during the year. One was the extraordinary flood at Kidete in April, May and June, 3½ kilometres of line being under water and no vehicle passing over the section for six weeks. The other was the restriction upon the despatch of food-stuffs from the famine area, extending roughly for 340 kilometres, during a considerable portion of the year. The actual weight of traffic was probably more than balanced by food sent up in relief by Government, but the restrictions prevented the forming of any idea of what traffic might have passed.

Traffic on the line is confined to a few stations, the majority not even paying the wages of the staff, and the country for the most part appears unproductive. As many stations as possible have been closed and only those kept open which are necessary to avoid excessive engine runs and to provide crossing places. There are 36 stations open and 18 closed.

The Tanga Railway has had longer to recover from the War than the central line, and is fortunate in the hinterland as far as Buiko, practically all the stations up to this point showing good results. The principal traffics are sisal, hides, cotton, coffee, fruit and grains, and there is a heavy passenger traffic. Some falling off may appear owing to lack of shipping and the high rate of exchange, although this section of the line is very promising and serves a fertile country. With the exception of Moshi the remainder of the line is unremunerative as it runs through desert country. The Voi-Kahe Railway is also unremunerative, though most of the traffic from Moshi finds its way to Kilindini, and will probably continue to do so, as Kilindini.

apart from being slightly nearer to Moshi than Tanga, provides a good wharf, crannage, and most important of all, shipping.

A comparison of the receipts for the nine months ending December 31, 1919, for 175 kilometres, Tanga to Buiko, and the remaining 308 kilometres, is interesting. Tanga to Buiko Rs. 287,995; Buiko to Voi Rs. 77,194, of which Moshi contributed Rs. 49,356 and Voi Rs. 17,508.

There are 21 stations on the Tanga line, eight on the Voi-Kahe line, and one on the Sigi line.

Goods Rates.—The tariff commenced in 1916 was completed during the year. The regulations are practically those in force on the Uganda Railway and most British lines, and the rates are principally those used by the Germans. The German tariff was a well-thought-out book and appears to be suited to the country. Owing to the existing unsettled state of the Territory, the shortage of shipping, and the fluctuating state of the market, it did not, and does not yet, appear advisable to make any change. For instance, it would be impossible to apply the usual theory for the formation of rates, and follow, through all the phases of a changeable market, the price of sisal, cotton, mica, etc., raising the rates as the price goes up and lowering them when the price falls.

Although not easy of comparison owing to the fact that a telescopic scale exists on the Tanganyika Railways, and on the Uganda Railway a flat rate, rates here are higher than those on the Uganda Railway. The Uganda Railway has over thirty special rates applicable to various commodities between certain stations or groups of stations. The railways in Tanganyika Territory have no special rates, but reduce by one class for certain heavy loading traffics in wagon loads.

Passenger Rates.—The Uganda Railway charge for first-class passengers is 18 cents a mile, or 11.25 a kilometre, against 9 cents here. The second-class fare is 9 cents a mile, or 5.63 a kilometre, against 5 cents here. For third-class passengers these railways have the German telescopic scale reducing upon each hundred kilometres up to 400 kilometres (after which the rates remain constant) and the Uganda Railway has a semi-flat rate going up in 5 cents for every 3 miles in advances of 2 cents and 3 cents per alternate mile.

Some examples of the third-class fares are given below :—

				<i>Uganda Railway.</i>	<i>Tanganyika Railways.</i>
				Fls.	Fls.
20 miles (32 kilometres)	...	...	...	0.50	0.50
80 " (128 " )	...	...	...	2.00	1.90
160 " (256 " )	...	...	...	3.70	3.60
320 " (512 " )	...	...	...	6.80	6.00
500 " (800 " )	...	...	...	9.50	8.10

Some slight increase might be made later in fares, but this cannot be done until value for money is given in the matter of stock. At present coaching stock is so short on the Tanganyika.

Railways that there is often only one vehicle of a certain class on the train, and if that vehicle fails, passengers have to be accommodated in another (generally lower) class.

(b) **Public Works.**—The first Public Works programme was drawn up early in 1918 while the War was still in progress. No new works were entered upon as it was realised that conditions were too uncertain to permit of any expenditure being incurred except such as was urgently required for the maintenance of communications. A number of bridges which had been destroyed or damaged as the result of military operations were rebuilt, and roads were cleaned and temporarily repaired.

The Kilosa-Iringa Road was completely surveyed with a view to obtaining a well graded waggon route throughout its length.

During 1919 a more extensive programme was undertaken. The Public Works Department was principally concerned in repairing the ravages of the military occupation. Practically no maintenance work had been undertaken during the five years of war, and the state of the roads and buildings was, in most instances, deplorable. The calls on the Department were in consequence very heavy. The principal works carried out were as follows :—

Dar-es-Salaam.—Improvements to the water-supply and drainage system were commenced ; two steel girder bridges (which had been destroyed by the Germans) over Msimbazi Creek on the Bagamoyo Road, 48 and 64 feet span respectively, were rebuilt ; the bridge over the railway cutting on the road to Gerezani Causeway, and various township roads, were reconstructed ; the retaining walls and railings on the approach road to the Customs House were re-erected ; and a new road, 2,200 feet in length, to avoid the railway level crossing beyond Dar-es-Salaam station, was made.

The Electric Power Station was transferred from military control on February 15, 1919. The condition of the engines was far from satisfactory, the whole of the plant being old and mechanically defective, and the boilers of two out of the three engines being practically worn out. Notwithstanding these defects, the reconstruction of the street lighting of the capital was undertaken. During the military occupation the system of street lighting had fallen into disuse, and much damage had been done to the electric standards, lamps, &c.

Morogoro.—The construction of bridges over the Wami, Tami, Kideti and several smaller streams on the Kilosa-Korogwe road was undertaken, and the Morogoro-Mlali road was rebridged.

Iringa.—70 miles of roadway were constructed between the Ruaha River and Iringa. This work was extremely heavy in places and included eight miles of 6 per cent. grade up the Kitonga Pass and a continuous rock cutting up the side of the Mloa River valley. A bridge over the Ruaha and the road over the second mountain range between Kisanga and Malolo were also commenced.

Tanga.—Two girder bridges over the railway cutting on the approach road to the wharf, which had been blown up by the German Forces, were rebuilt.

Preliminary work in connection with the rebuilding of the Ulenge Lighthouse, which was completely destroyed during the War, was also undertaken.

Moshi.—The Karanga bridge was re-constructed, and a three span steel and masonry bridge (60, 20 and 20 feet spans respectively) was erected over the Seri River.

Work was commenced on a lattice girder type bridge over the Weru-Weru River to replace a suspension bridge erected by the military.

A comprehensive programme was entered upon in 1920, but lack of staff has prevented many works from being undertaken.

The following were the more important works carried out or put in hand :—

Dar-es-Salaam.—Work was commenced on a new Government House in March, the site chosen being that of the German Governor's Palace. This building was completely destroyed by shell-fire in 1914, and only the veranda, pillars and ground floor walls remained standing. The design adopted for the new building is mainly Moorish-Arabesque in character.

Preliminary work was commenced on the new Electric Power Station. The buildings for this work had been brought up to the first floor level by the Germans prior to the War, and most of the plant was on the site, but had not been erected.

A six feet diameter concrete culvert with a tidal valve was built in the Gerezani Causeway. The new work reduced the average level of the creek by two feet and enabled drainage works to be undertaken at its higher levels. A large area of land has also been reclaimed.

A sea-wall, approximately 4,500 feet in length, is in course of construction along the foreshore between the European Hospital and Sea View Point. This was urgently required owing to the serious coast erosion which had taken place between these points.

A new passenger landing stage was completed at the port, the old structure having been destroyed during the War.

Tanga.—The reconstruction of the Ulenge lighthouse was commenced. The new light will be 80 feet above high water at spring tide, and is designed to give 2 white flashes every 10 seconds. The candle power will be twice that of the original German light; and the length of the flash will be 1/5th of a second, as compared with 1 second in the old light.

Lindi and Kilwa.—Work was undertaken on the sea-walls at these ports, and preliminary surveys and plans were prepared for deep water piers at the harbours of Lindi and Mikindani.

Roads and Bridges.—Construction work on the Kilosa-Iringa road proceeded steadily. The Kitonga deviation was completed, and the Elphons-pass deviation, the work on which consisted chiefly of cutting through solid rock, was well advanced. Considerable damage was done to newly constructed sections of the Kilosa-Iringa road by the vagaries of large herds of elephants.

The opening up of District roads generally was proceeded with, and steel and masonry type bridges were erected over the Useri River (Moshi-Arusha Road), Mpigi River (Bagamoyo Road), Ngono River (Kigali Road), and on the Ruvu-Kisaki Road.

XI.—MEDICAL AND SANITATION.

(a) **Medical.**—The formation of a Medical Department began early in 1917, with the appointment of a Principal Medical Officer and two Medical Officers, who were seconded from the West African Medical Staff. They were joined later in the year by a Medical Officer of the Imperial Bureau of Entomology, and in 1918 by two other Medical Officers seconded from the West African Medical Staff and by 5 Nursing Sisters.

Tanga Hospital was taken over from the Military authorities in April, 1918, various other stations following during the same year. Dar-es-Salaam Hospital, however, did not come under Civil control till April, 1919.

In March, 1920, a Senior Sanitary Officer and a Director of the Dar-es-Salaam Laboratory were appointed, and some assistance was given by various Missionary Societies.

At the present time, Medical Officers are stationed at the two Dar-es-Salaam Hospitals, and at Tanga, Moshi, Arusha, Mwanza, Morogoro, Dodoma, Tabora, Tukuyu and Kasanga: Medical Officers of Health have also been appointed for Tanga and Dar-es-Salaam. Indian Sub-Assistant Surgeons are acting as Medical Officers at eight stations, Compounders being in charge elsewhere.

During the past year an effort has been made to standardise and regulate the reports and returns submitted by medical officers, and it is hoped that in future years valuable information and useful statistics will be available.

Hospitals and other Buildings.—The hospitals are, on the whole, very satisfactory, though the German system of sanitation leaves much to be desired. The Dar-es-Salaam hospital is well equipped, with accommodation for at least 50 beds. Separate wards, maternity section, X-ray room, operation theatre, and staff quarters, are all provided; while the Bacteriological Institute, Dispensary, Mortuary Chapel, Laundry, &c., adjoin it in the grounds. The Sewa Hadji Hospital at Dar-es-Salaam provides for native requirements, though it can scarcely be considered adequate. There is also a very useful hospital at Tanga, while others exist at Tabora, Lindi, Arusha and Mwanza; and there is a fine sanatorium at Vugiri in the Usambara Mountains. The German Government had no lunatic asylum, but a small native asylum belonging to a Lutheran Mission exists in an inaccessible spot in the Usambara Mountains, which barely suffices for the districts of Tanga, Usambara and Pangani. Another lunatic asylum in a more central position, which should afford limited accommodation for European patients as well as for natives, is urgently required.

Leprosy is widely distributed through the Territory, and the Germans were arranging an elaborate isolation system before the War: during hostilities, however, these communities were, in many cases, dispersed, and an endeavour is now being made to re-assemble them. So far 3,082 are in segregation camps, and it is estimated that another 2,500 are at large, but accurate figures are not yet available. It is found that the incidence is about one leper in 725 of the population (the figure for India being one in 2,888).

Sleeping Sickness.—This occurs in three distinct districts, (1) the Victoria Nyanza Region; (2) the Lake Tanganyika Region; and (3) the Southern area in the neighbourhood of the Rovuma River. Documents have been found relating to German research on this subject, and the following facts are recorded:—

(1) The Victoria Nyanza Region. *Glossina palpalis* was found on the greater part of the lake shores and the islands, the banks of the Mori River being considered the chief centre of infection. A concentration camp was established at Utegi on the Mori River, and by 1911 much of the lake shore had been cleared, and two concentration camps, containing 700 cases, formed. The situation was considered to be well in hand, the new cases having been reduced from 1,405 in 1908 to 27 in 1912.

(2) The Tanganyika Region. The disease was reported on almost all the eastern shores of the lake, and along the Mlagarasi, Rugufu and Luegere Rivers: the Congo was considered the chief source of infection. Some areas had been cleared and isolation camps opened; there were said to be 3,303 cases under observation in 1912, and it was considered that many years of laborious effort would be required to deal with the trouble effectually. The most heavily-infected areas now lie within the Belgian sphere.

(3) The Southern Area. Dr. Beck's expedition in 1911 reported that Sleeping Sickness was endemic on the entire upper course of the Rovuma River; he made the interesting remark that nowhere in the Southern area is *Glossina palpalis* found to exist, though *G. morsitans* was widespread. Further investigations were made on the shores of Lake Nyasa, but only one case of the disease was found. An isolation camp was formed for 43 cases at Sasawara on the Rovuma. The Germans believed infection to be caused by *Glossina morsitans*, and they considered game to be a negligible factor in the carrying of the disease: their conclusions generally were of considerable scientific interest.

No cases have so far been reported to the Medical Officers, and the present position is not very clear: further investigation of the Rovuma is much needed, but it has been impossible hitherto to carry out much research work owing to shortage of staff. Investigations undertaken by Dr. Lamborn, one of the Medical Officers, represent the only work done, and these were incomplete. The German measures are being maintained, and precautions are being observed on Lakes Victoria and Tanganyika, but organised investigations should be carried out as soon as possible.

It is said that the German Medical Staff engaged on Sleeping Sickness duties alone consisted of 9 Medical Officers and 16 Non-Commissioned Officers.

The following tables are attached as Appendices III-VI :—
European Government Servants invalided, with cause.

Asiatic	“	“	“	“
Deaths of European Government Servants, with cause.				
“	Asiatic	“	“	“

(b) **Dar-es-Salaam Laboratory.**—Considerable reorganisation was necessary at the Laboratory, the stables for the production of calf lymph in particular requiring reconstruction. Stock cultures have been obtained from England and South Africa, though it is hoped that these will be unnecessary when we can make our own agglutinating and hæmolytic sera. Little research work has so far been possible, but numerous observations have been made on the diastatic activity in the urine and blood of tropical diseases; rats have been examined for possible carriers of Enteric organisms and Spirochaete of Jaundice; blood examinations for parasites have been made in 1,352 cases, in which one interesting result was discovered, viz., in the frequency of the subtertian variety of malaria, as compared with the preponderance of benign tertian during military days, probably owing to the presence of Indian troops. 2,500 rats have been tested for plague, all with negative results.

(c) **Dental.**—The Government Dentist, who is stationed at Dar-es-Salaam, has been fully occupied, but was also able to visit Zanzibar on two occasions, at the request of that Government.

(d) **Sanitation.**—The report on this subject is of necessity lacking in many of the figures and statistics usually found, owing to the recent establishment of this branch of the Medical Department and the comparatively small areas with which it has so far been possible to deal. This accounts for the absence of figures dealing with such matters as vital statistics, infantile mortality, and prevalence of Tuberculosis, Venereal Disease, &c.

Spheres of Action.—It was decided in June, 1920, that the Sanitation Branch should deal with (a) epidemic diseases, (b) preventive aspects of malaria and certain other diseases, (c) sanitation equipment, (d) expenditure connected with the branch.

Staff.—The Senior Sanitary Officer arrived in March, 1920, when the staff consisted of 2 Medical Officers of Health, 5 European Sanitary Inspectors, 18 Native Inspectors and 741 sanitary labourers. The two health officers were stationed at Dar-es-Salaam and Tanga. Of the labour personnel, Dar-es-Salaam absorbed 253, Tanga 64, and Tabora 68.

Funds.—The amount allotted for 1920–21 to this Branch amounted to 23 per cent. of the Medical Department's Vote, or 1·4 per cent. of the total expenditure for the Territory.

Legal.—The necessary sanitary measures derive legal support from (a) certain sections of the Indian Penal Code, (b) various

proclamations and Ordinances dealing with such matters as Registration, Port Health, Anthrax, Quarantine, &c., (c) township rules, which control bakeries, butcheries, dairies, suppression of mosquitoes and other local questions.

Dar-es-Salaam Township.—The sanitation of Dar-es-Salaam was taken over from the Military in February, 1919, when the work before the Branch was found to be very great: drains and cesspits required repair, roof gutterings were choked, mosquitoes and flies abounded, and sanitary precautions among the Asiatic and African populations were almost non-existent. In May, 1919, all Military labour was withdrawn, and the Port Medical work was also taken over by the Civil authorities.

The Health Office.—This deals with (a) the Port of Dar-es-Salaam and (b) the town. Of these the Port duties are not very onerous, the inspecting of small coastal ships being carried out by a Sub-Assistant Surgeon; while the sanitary precautions taken at Zanzibar lighten the work in the case of larger ships, most of which call there en route from Mombasa and India. Valuable assistance is also rendered by the undertaking of the Zanzibar Government to accept quarantine and disinfection cases, with which it would be most costly and difficult to deal, with the resources at present existing in Dar-es-Salaam.

Ships cleared.—A monthly average of 11 steamers and 41 dhows was cleared from the port during the last 14 months; this number may confidently be expected to increase.

Municipal Duties.—The municipal duties are very heavy, and the existing staff is by no means adequate. The duties consist of (a) disposal of refuse, inspection of drainage system and water supply, and supervision of food supply; (b) special services, such as control of preventable diseases, vaccination, suppression of mosquitoes and rats, certification of lepers, upkeep of infectious diseases hospital, control of cemeteries, registration of deaths, &c.; (c) miscellaneous duties such as the keeping of meteorological records and training of native sanitary inspectors; (d) attendance on building, housing and licensing committees; (e) town improvement. These duties have in the past been carried out only in a perfunctory manner, owing to the lack of an efficient subordinate staff: as this difficulty is overcome, it is to be hoped that the general condition of the town, which at present still leaves much to be desired, will be markedly improved.

Review of Work Performed.—During the period under consideration, the work done consisted mainly of remedying the serious state of neglect into which the town had fallen during the latter part of the military régime, when their staff was being rapidly reduced. Deserted camps, disused latrines, derelict tanks, &c., all required attention, and this with a far smaller staff than the previous military one. Difficulty was also experienced owing to the shortage of maps, registers and equipment, while the necessary clerical staff was lacking. Improvement was rapid, however, and by October, 1919, matters were generally far more satisfactory, owing to the finish of the rains and the clearing up of the relics of the military occupation. Drainage

and anti-mosquito work proceeded rapidly with good results, the importance of the proper upkeep of roads and surface drainage being emphasised by experience. In July, 1920, it became necessary to add the executive health work to the duties of the Sanitation Officer, and this was most unfortunate, as it gave this officer far more than he could do, besides immobilising him for any possible visits to distant places on which expert opinion might be necessary. The Sanitary Superintendents and the Asiatic staff have also been kept most fully occupied, owing to the necessity for the constant supervision of the African staff. The establishment of a school of sanitation for Africans has been attempted, to ensure a supply of suitable men for outstations: it is hoped that this will prove of real value, though it is found most difficult to induce the native to carry out his duties reliably and thoroughly, good though his knowledge of the subject may be.

Disposal of Refuse.—The present system consists of carting all the town refuse in ox-carts, for destruction in open incinerators: this leaves much to be desired and the provision of a forced draught incinerator served by motor transport is of great importance.

Markets.—The control of the markets formerly under the District Political Officer, is now to come under the Health Department, a much more suitable arrangement. The existing accommodation is, however, quite inadequate and insanitary, and a better site will shortly be occupied.

Housing.—The houses provided for officials are on the whole good, though the design is scarcely according to modern ideas: in particular, the flat system must be wholly condemned, the small saving in cost of building being quite outweighed by the discomfort and irritation caused to the occupants, with consequent loss of health and powers of work.

Town Planning.—A Central Building and Town Planning Committee has been formed to regulate this question, and endeavours are being made to secure a European residential area bounded by a neutral zone clear of all buildings. Racial segregation not being practicable, a standard to which all new buildings must conform has been adopted, and this, it is hoped, will secure the same advantages. The provision of suitable open spaces has also been kept in view.

Prevalence of Disease in the Township.—Malaria was rife during the military régime, and this question is being energetically faced: a "spot map" is maintained, to indicate the chief danger zones in the town. Prophylactic quinine treatment of native officials is recommended. Blackwater fever appears relatively rare; other infectious diseases, such as Dysentery and Enteric, made their appearance, but the infectious diseases hospital has had few admissions during the year. Anti-malarial measures in the town have consisted of drainage of swamps and the introduction of larvacious fish. The Gerezani swamp in particular presented a considerable problem: this has been dealt with by drainage and levelling, the construction of a tidal valve, and the substitution of mealies for the former crops of sugar cane and

sweet potatoes with their irrigation pools and ditches. These measures have had excellent results, and it is hoped that the value of the crops from the reclaimed land will go far to repay the cost of the work. The Msimbazi swamp will be similarly dealt with, and it is confidently believed that when these works are completed, Dar-es-Salaam will show a notable improvement in health.

Necessary Sanitary Works.—The following sanitary works are urgently necessary:—(a) A pure-water system. The existing system of surface wells is unsatisfactory and dangerous, and a piped or channel supply is essential. (b) Street drainage, where more permanent work is required. (c) Additional drainage questions, such as the disposal of storm water, the repair of the foreshore culverts, and the reconstruction of tide valves and the dockyard drains. (d) Improvements in the public latrines, sanitation of the European houses, improvements of cesspits and cisterns, and collection of rain water.

Tanga Township.—The civil sanitation of Tanga was taken over in June, 1917. It formerly had a bad reputation for malaria, and special attention was therefore paid to this question: there was also a considerable danger of plague infection from Mombasa, while an outbreak of influenza in October, 1918, also necessitated a great deal of work. Vaccination was widely carried out, an outbreak of small-pox occurring in November, 1919. The town admits of good drainage, and the problem of the general improvement of health conditions appears to be chiefly one of funds available. Anchylostomiasis is widely prevalent, but is being largely reduced by improved sanitation. Water-borne diseases are relatively rare owing probably to the general use of soda water of unimpeachable quality. The water supply, however, is most unsatisfactory and the provision of an improved one is an urgent matter. The present staff at Tanga consists of one Medical Officer of Health, one European Sanitary Inspector, 4 Native Sanitary Inspectors and 64 general labourers.

Rural Sanitation.—Sanitation in outstations is carried out by the Medical Officer, or, if there is none, by the Sub-Assistant Surgeon or Compounder, funds being provided from the Sanitation Vote for labour.

Railway Sanitation.—At the request of the General Manager, this has been undertaken by the Health Department, one European Inspector with 25 labourers being stationed at Dar-es-Salaam under the Medical Officer of Health, while the Medical Officers at Morogoro, Tabora and Moshi supervise the sections within their jurisdiction.

Infectious Diseases.—Influenza was, at the time of the Armistice, pandemic: reliable figures are not available, and the compilation of these is rendered more difficult by the reluctance of native cases to go into hospital. A mild outbreak of influenza took place throughout Tanganyika Territory at the end of 1920.

Plague.—This has happily been absent from the Territory since the British occupation, though a somewhat similar disease of obscure nature appeared at Iringa in 1918 and at Singidda in 1919. The ports of Dar-es-Salaam, Tanga and Mwanza are the most vulnerable points, but the efficient measures taken at Zanzibar are of great assistance: the dhow traffic also represents a source of danger.

Small-Pox.—This has been widespread throughout the Territory, having been generally distributed by the constant movements during the campaign: it was pandemic, and no line of infection can be traced, cases being reported from practically all over the country. Vaccination has not proved of such value as might have been hoped, owing to the difficulty of maintenance in activity of the vaccine: the lanolinated vaccine lymph appears more satisfactory than the glycerinated lymph or the dried vaccine. It is intended to carry out universal vaccination by means of a trained native staff: this is facilitated by the willingness of the native to undergo the process.

Anchylostomiasis is common, though it appears chiefly between Moshi and Tanga: it is serious in its results owing to its weakening effect on patients, in addition to the actual mortality directly resulting from it. The treatment consists mainly in the provision of proper sanitary accommodation, and the introduction of this, as feasible, may be expected to do much to stamp out the disease.

Spirillum or Tick Fever appears to be widely distributed, the Tabora and Mwanza Districts being particularly affected: the best preventive measures are the provision of proper barracks and quarters, and the avoidance of infested dwellings.

Malaria.—This was widespread, though reliable figures for the various stations are not available. Tabora would appear to be the most affected district.

Cerebro Spinal Meningitis.—The Territory has been practically free of this since 1918, though cases were reported in Bukoba and Moshi.

XII.—POSTAL, TELEGRAPH, AND TELEPHONE SERVICES.

A Civil Postal Service was opened in Tanganyika Territory on June 1st, 1917. At this time the British Forces had advanced south of the Central Railway, and the Field Post Office which was sent from India with the Expeditionary Force having gone forward with the troops, certain post offices in the Northern area, which had been, or were on the point of being, closed, were transferred to the Civil Administration. These offices were Bukoba, Mwanza, Arusha, Moshi, Wilhelmstal, Buiko, Korogwe, Tunga, and other places on the Tanga Railway.

The Civil Administration assumed control of the telegraph lines in the Northern area on June 1st, 1918, and the complete transfer of the whole of the telegraph lines in the Territory was made on

March 1st, 1919. The Field Post Offices at Dar-es-Salaam and in the Southern area were taken over by the Civil Administration on March 15th, 1919.

A school for the training of natives in telegraphy was opened at Tanga in November, 1917. A few natives who had previously been employed as telegraphists in the German Post Office were enrolled, as well as other boys who were able to pass a hand-writing test. The former were unable to receive by sound as they had been accustomed to the use of the Morse-printer which was the type of instrument used by the Germans. With one exception none of the boys had any knowledge of English, and the progress made in the school was consequently not so rapid as it might otherwise have been. The work done was, however, so promising that the school was extended until there were approximately 100 boys under training.

In anticipation of the whole of the posts and telegraphs being taken over, the Military Authorities were approached towards the end of 1918 with a view to the recruitment of members of the military telegraph staff, and the terms and conditions of service under the Civil Administration were circularised. This led to the engagement in the early part of 1919 of 52 European postal clerks and telegraphists and Telegraph Inspectors direct from Military service. As sufficient staff could not be obtained locally, a request was forwarded for a certain number of men to be recruited in England.

At present there are 92 native telegraphists in the service, and all but 19 of these have passed out of the school and are performing telegraph and telephone duties.

The staff asked for from Home began to arrive in March, 1920: Most of the maintenance staff have been recruited, but the authorised establishment is still short of 15 postal clerks and telegraphists.

Additional postal and telegraph facilities are now being introduced. A Parcel Post Service has been commenced between Kenya Colony and this Territory and also with the United Kingdom, and arrangements are on foot to establish like services with India, Zanzibar, South Africa and Nyasaland.

A limited Money Order Service with the United Kingdom and other countries, through the intermediary of Kenya Colony, was inaugurated on January 1st, 1919. Negotiations have now been started for the establishment of direct Money Order Exchanges with the United Kingdom, India, Zanzibar, South Africa and Nyasaland. Money Order business must, however, for some time be restricted to the principal offices.

For the first few months of 1917 postage stamps of the British East Africa and Uganda Protectorates were used in this Territory. The same stamps overprinted "G.E.A." were then introduced, and are still in use. It is expected that within the next few months the new design of stamps for Tanganyika Territory will be introduced. The total received from sales of stamps is Rs. 386,412. Of this, roughly Rs. 165,000 worth has been sold

to dealers and collectors. In the Military Post Offices Indian stamps surcharged "I.E.F." were used. Separate issues were also made in 1915 in the Island of Mafia and in 1916 in the south-western part of German East Africa, when occupied by our troops. The Belgians have used their own stamps in the Territory occupied by them.

The same postage rates as in Kenya Colony, viz. : 6 cents per ounce inland and to the United Kingdom and all British Colonies, were introduced in this Territory at the outset. Later these rates were increased to 9 cents per ounce.

The German telegraph system consisted of lines between Arusha and Moshi; Moshi and Tanga, with branch lines to Wilhelmstal, Amani and Handeni; Tanga to Mikindani along the coast; Dar-es-Salaam to Lake Tanganyika; Kilosa to Iringa; and Tabora to Muanza. Formerly there was wireless communication between Muanza and Bukoba and also a coast wireless station at Dar-es-Salaam, but the wireless plant was destroyed by the Germans in 1914-15.

The telegraph system is now well over 3,000 miles route mileage, or 5,700 miles wire mileage. During the War additional lines linking up important centres, chiefly in the southern area, were constructed by the Military. The war lines extend from Iringa to the border of Nyasaland, via Tandala and Tukuyu (New Langenburg), joining up with the African Trans-continental Telegraph Company's system; from Tandala to Songea via Manda (Wiedhafen); from Songea to Tunduru; from Tunduru to Lindi; and from Dodoma on the Central Railway to Iringa. All these lines were taken over by the Civil Administration, and, with the exception of the Dodoma-Iringa section, which is being dismantled, and the section between Songea and Tunduru, are being maintained. On the southern frontier of Uganda the Military also erected a temporary line from Masaka to Bukoba. This line is being maintained and telegraphic communication with Bukoba is thus available via Kenya Colony and Uganda. A permanent telegraph line was similarly constructed from Voi to Kahe Junction near Moshi, and telegraph traffic between Kenya Colony and this Territory is forwarded via this route. Another line which was constructed (between Tanga and Mombasa) is no longer used.

All the lines were in very bad condition when taken over by the Civil Administration. The German lines had been seriously damaged in places by the retreating enemy, and permanent restoration had not been effected by the Military. Also the war lines were mostly of a temporary nature, many types of fittings being used. Portions of the lines are still suspended from trees, and sections of the conductor consist of barbed wire. Now that more maintenance staff is available reconstruction will be undertaken. Hitherto it has only been possible to keep the lines working.

Before the War a telegraph line was built through German Territory from Abercorn, Northern Rhodesia, to Kigoma (on Lake Tanganyika). This line was erected by the African Trans-

continental Telegraph Company under contract with the German Government, with a view to joining up the Kenya Colony and the African Trans-continental Telegraph Company's systems. But the Company failed to carry out the conditions of the contract and the line apparently became the property of the German Government. A part of this line is now being used to link up Kasanga (Bismarckburg) and Namanyere with Abercorn. The greater part of the remainder is in the Territory which is still being administered by the Belgian Government, but it can serve no useful purpose since Kigoma is connected by telegraph with Dar-es-Salaam via the railway route.

With the linking up of the telegraph systems of Kenya Colony and Tanganyika Territory there is an alternative outlet available for overseas traffic should either the Mombasa-Zanzibar or Dar-es-Salaam-Zanzibar cable be interrupted. An extra outlet is also provided for cable traffic from Nyasaland and Rhodesia. On several occasions Government cablegrams from Nyasaland and Rhodesia have been circulated to the cable service via Dar-es-Salaam, also cablegrams from Kenya Colony have been so circulated at times when the ordinary route to Zanzibar has been interrupted.

It has not yet been possible to open a public telephone service. So far as Dar-es-Salaam is concerned, work is well in hand. A new telephone standard is nearing completion, and it is expected that a public service will be established in the near future. Steps will also shortly be taken to improve the telephone service in Tanga and Mwanza.

The telegraph revenue for 1919-20 was Rs. 126,955 and it is estimated that that for the current year will be Fls. 180,000. The volume of telegrams dealt with during the period April 1st, 1919, to March 31st, 1920, is shown in Appendix VII.

The steamer service with Dar-es-Salaam has been greatly improved, but Tanganyika Territory is not so well served as the neighbouring Colony and Protectorate. Mails are generally landed at Zanzibar, and are brought over by the first available ship. Outgoing mails are likewise forwarded to Zanzibar to connect with steamers from that port.

Post and telegraph offices have been opened at all places of importance in Tanganyika Territory. A list is given in Appendix VIII.

XIII.—GOVERNMENT INSTITUTIONS.

(a) **Amani Institute.**—The Biological and Agricultural Institute at Amani in the Usambara Mountains was established in 1902. The admitted purpose of the creation of the Institute was the provision by Germany for her tropical African possessions of an establishment which might be counted upon to serve these as well as the corresponding Institute at Pusa in Behar serves our great Indian Dependency, and as the Institute at Buitenzorg, in Java, has long served the Netherlands East Indies. The results

secured at Amani during the brief period of its activity have shown that under German management this Institute was a worthy rival both of Pusa and Buitenzorg, and bade fair to confer benefits on Tropical Africa generally as great as those which already stand to the credit of the Indian and the Javan establishments. Unbiased accounts of the work carried out by this Institute indicate that its operations were conducted in a manner befitting the design for which it was created, and that the Germans had there developed an admirable scientific establishment devoted to successful intensive study of the problems connected with vegetable physiology both on the nutritive and the genetic side, with plant pathology both as regards diseases caused by pathogenic fungi and those due to injurious insects, and with the chemistry, both of soils and of plants, which confront tropical agriculture.

The site selected for the Institute covers an area of 600 acres of forest and woodland situated on the eastern spur of the Usambara Mountains, and distant some 20 and 22 miles from the Muheza and Korogwe Railway Stations respectively. The lower part of the estate has an altitude of 1,200 feet, the upper part, where the houses of the staff and the laboratories, &c., have been built, 3,300 feet. The average annual rainfall is 77·32 inches; the maximum and minimum temperatures are 89·2 and 53° Fahrenheit.

The Institute is well-equipped, three large stone buildings serving as Chemical and Biological laboratories, as a library, and for the housing of botanical and seed collections. There are also 16 dwelling-houses, various stores, a book-binding shop, machinery sheds, workshops, drying and propagating sheds, a pottery factory, &c.

230 acres are under cultivation, having been planted out in plots of varying extent with economic plants, both indigenous to the country and imported from other tropical lands. These embrace numerous varieties of rubber, agaves and other fibre-producing plants, oil and edible palm nuts, deciduous and non-deciduous fruit trees, gums, resins, gutta-percha, coffee, tea, cocoa, colanut, cinchona, cinnamon, pepper, medicinal and etherical plants, heavy oil, fat, wax and tannin-producing plants, &c. The remaining 370 acres are for the most part covered with valuable forest.

Near Muheza, at Tengeri Station on the Tanga Railway, a further 100 acres has been placed under cultivation for experimental purposes, not only with some of the above-mentioned plants, but also with various kinds of maize, beans, rice, rye, ground-nuts, tobacco and other annual crops. This estate is in the plains at an altitude of less than 500 feet.

After the outbreak of the War the staff was gradually reduced, and on the occupation of Tanga by our troops in July, 1916, it consisted only of the Director, one botanist, the head gardener, two Javanese, one Indian mechanic and 50 labourers. It was

decided to retain and pay this staff, and they carried on their duties until steps were taken at the end of 1919 to appoint an English Director. The Germans with their families were repatriated in September, 1920.

The future of the Institute is at present under consideration, and proposals have been made for establishing at Amani a central research institute for all the British territories in East Africa, where research work could be carried out continuously and systematically, and where the scientific results obtained in the different countries would be collected and made readily accessible.

(b) **Experimental Stations.**—*Kibongoto.* This is a Government farm in the Moshi District some 665 hectares in extent. It was used by the Germans as an experimental farm for stock and tobacco. A few acres of coffee were planted but the trees have suffered during the War, and the plantation has since remained unworked.

Mpanganya.—The Mpanganya cotton farm on the south bank of the Rufiji River was established not long before the War. It is approximately 75 hectares in extent and bears the same name as a similar farm established previously on the north bank of the river. Cotton seed from this farm was most favourably reported on. This station is not at present worked.

Mahiwa.—The Mahiwa cotton farm of 300 hectares is situated in the Lindi District on both banks of the Mahiwa River. The property has been leased for one year.

Myombo.—The Myombo farm, some six miles from Morogoro on the Kilosa-Iringa road, is 210 hectares in extent. It was started in 1910 or 1911 for experimenting in cotton, and buildings and cotton machinery were erected by the Germans. A short lease of this plantation, expiring in October, 1921, has been granted.

Morogoro.—The Government farm at Morogoro is some $1\frac{1}{2}$ miles from the railway station. The area is 500 acres and is planted up with fruit trees of various tropical varieties and with deciduous fruits. The trees number about 4,000. The farm is worked by the Government in connexion with the Central Gaol.

Mombo.—The Mombo experimental farm in the Usambara District is 368 hectares in extent. The farm was leased by the German Government to a German subject who planted some 80 hectares of sisal and established a sisal factory. It has now reverted to Government, but is not being worked.

(c) **Dockyard at Dar-es-Salaam.**—The Dockyard at Dar-es-Salaam, which is the only one of its kind on the East Coast of Africa between Suez and Durban, covers an area of $4\frac{1}{4}$ acres.

The machine and workshops, which are roofed in, cover $2\frac{1}{2}$ acres. The laying out has been well planned, and the arrangements of the shops are such that extensions could be carried out without interfering with the general arrangement. There are

also two slipways, the largest of which is capable of taking a 120-ton lighter.

During the past year boat-building has been carried out in the dockyard on an extensive scale; a 10-ton marine boiler, belonging to the S.S. "Fifi," has been practically rebuilt; a 120-ton lighter has been completely replated and decked; all the pontoons and cargo landing stages have been renovated; various steam-tugs and motor launches have been reconditioned, and cranes and winches overhauled; and much work has been done on the Government S.S. "Lord Milner" and "Mwanza."

The dockyard is at present capable of undertaking any ordinary floating repairs to ships.

Appendix I.

IMPORTS.

	1912.	1913.	1917-18.	1918-19.	1919-20.
	Rs.	Rs.	Rs.	Rs.	Rs.
Cotton Piece Goods	11,238,619	11,390,937	6,838,028	7,035,925	8,314,981
Rice ...	2,490,148	2,786,021	539,570	1,064,433	765,760
Other Foodstuff ...	2,890,736	2,951,857	2,590,496	1,472,666	2,238,645
Kerosene...	398,590	466,898	345,123	316,692	582,533
Cigarettes ...	670,183	657,543	449,132	588,412	477,228
Tobacco ...					
Spirits ...	314,844	312,091	142,610	339,712	546,750
Wines and Beer ...	653,353	577,620	69,180	177,182	272,398
Other Imports. ...	18,663,480	18,994,434	5,432,215	3,797,115	3,767,615
	37,319,953	38,137,401	16,642,895	15,116,097	17,376,405
<i>Distribution of Import Trade.</i>					
Dar-es-Salaam ...	19,859,145	19,699,298	10,497,166	8,786,568	7,003,587
Tanga ...	8,939,308	9,099,474	2,864,793	3,244,729	3,777,481
Mwanza ...	1,825,594	2,086,263	1,388,069	1,380,319	2,708,196
Bukoba ...	1,946,889	2,157,122	365,759	480,772	1,467,902
Lindi ...	1,375,035	1,729,862	—	91,196	984,948
Other Stations ...	3,373,982	3,365,382	1,527,108	1,132,513	1,434,291
	37,319,953	38,137,401	16,642,895	15,116,097	17,376,405

Appendix II.

EXPORTS.

Main articles.	1912.		1913.		1917-18.		1918-19.		1919-20.	
	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.
SISAL HEMP.										
Dar-es-Salaam ...	471	183,878	448	170,848	569	385,895	472	253,721	1,685	686,781
Tanga ...	10,614	3,234,638	12,427	4,986,606	2,387	2,158,465	7,375	3,828,865	14,959	5,834,091
Mwanza ...	23	8,137	70	33,907	137	83,621	17	7,736	—	—
Bukoba ...	—	—	—	—	—	18	—	—	—	—
Lindi ...	1,616	594,933	2,545	942,885	—	—	25	12,500	—	—
Other stations ...	4,356	1,497,828	5,345	1,899,447	251	93,010	65	19,792	100	22,500
	17,080	5,519,414	20,835	8,033,693	3,344	2,721,009	7,954	4,122,614	16,744	6,543,372
COTTON.										
Dar-es-Salaam ...	642	544,730	781	661,839	623	825,183	516	954,307	500	434,860
Tanga ...	226	219,599	58	71,925	96	81,327	57	53,939	9	11,234
Mwanza ...	364	270,418	675	480,793	157	205,967	87	152,127	54	91,946
Bukoba ...	2	1,631	5	3,515	1	760	—	36	—	14
Lindi ...	191	176,410	363	327,440	—	—	19	32,184	151	354,900
Other stations ...	457	369,889	310	265,788	33	12,574	73	108,989	27	42,055
	1,882	1,582,677	2,192	1,811,300	910	1,125,811	752	1,301,582	741	935,009
HIDES.										
Dar-es-Salaam ...	495	467,247	864	969,102	—	359	132	96,949	1,879	1,518,723
Tanga ...	319	279,014	325	378,609	510	521,132	343	395,043	252	211,151
Mwanza ...	839	816,688	938	1,068,337	681	683,002	950	545,176	1,378	1,212,822
Bukoba ...	1,122	1,321,715	1,189	1,535,300	321	322,497	27	22,745	96	85,102
Lindi ...	6	3,378	4	2,671	—	—	—	—	—	—
Other stations ...	163	152,470	137	163,647	2	1,175	80	93,334	339	379,212
	2,944	3,040,512	3,457	4,117,666	1,514	1,528,165	1,532	1,153,247	3,944	3,407,010

Appendix II—continued.

EXPORTS—continued.

Main articles.	1912.		1913.		1917-18.		1918-19.		1919-20.	
	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.
SKINS (Sheep, Goat).										
Dar-es-Salaam ...	—	—	—	—	32	69,888	14	16,967	56	113,929
Tanga ...	—	—	—	—	17	12,476	6	7,452	13	32,907
Mwanza ...	—	—	—	—	25	45,847	12	16,395	132	185,710
Bukoba ...	—	—	—	—	2	2,115	1	1,592	8	13,400
Lindi ...	—	—	—	—	—	—	—	—	—	—
Other stations ...	—	—	—	—	—	4,314	23	29,786	35	91,734
	—	—	—	—	76	134,640	56	72,192	244	437,680
COPRA.										
Dar-es-Salaam ...	1,860	522,255	2,212	702,104	669	210,272	278	70,218	923	329,782
Tanga ...	931	275,890	1,332	459,229	1,365	401,698	892	202,522	2,321	624,145
Mwanza ...	—	—	—	—	—	—	—	—	—	—
Bukoba ...	—	—	—	—	—	—	—	—	—	—
Lindi ...	6	1,757	36	18,186	—	—	—	93	37	11,391
Other stations ...	1,445	372,380	1,897	581,490	1,295	341,377	1,270	250,802	2,049	616,143
	4,242	1,172,282	5,477	1,761,009	3,329	953,347	2,440	523,635	5,330	1,581,461
COFFEE.										
Dar-es-Salaam ...	2	3,469	3	2,825	—	—	3	2,043	13	10,121
Tanga ...	892	855,903	599	445,542	490	237,934	74	40,391	126	109,426
Mwanza ...	—	—	—	—	—	—	—	125	—	—
Bukoba ...	672	561,809	403	209,123	1,228	325,694	1,183	328,112	2,042	1,217,942
Lindi ...	—	—	—	—	—	—	—	—	—	—
Other stations ...	9	6,345	54	40,955	—	31	296	130,760	1,745	1,470,116
	1,575	1,427,526	1,059	698,445	1,718	563,659	1,556	501,431	3,926	2,807,605

GROUNDNUTS.											
Dar-es-Salaam	...	330	66,988	1,749	347,957	—	—	47	11,934	163	66,350
Tanga	...	—	—	—	—	—	—	—	—	10	2,803
Mwanza	...	3,341	497,711	4,508	664,891	1,612	276,701	530	149,346	112	41,917
Bukoba	...	659	94,291	1,019	142,953	62	11,093	303	70,661	464	135,166
Lindi	...	269	55,512	252	50,296	—	—	—	—	57	16,102
Other stations	...	1,479	240,298	1,432	232,877	—	5	—	3	18	6,664
		6,078	954,800	8,960	1,438,974	1,674	287,799	880	231,944	824	269,002
GHEE.											
Dar-es-Salaam	...	33	28,566	84	75,022	2	2,460	31	42,753	192	240,128
Tanga	...	8	6,248	4	3,901	3	4,607	4	5,455	14	25,294
Mwanza	...	242	130,864	210	126,519	237	227,296	226	229,924	282	269,996
Bukoba	...	—	—	—	—	—	143	1	1,040	—	185
Lindi	...	—	—	—	—	—	—	—	—	—	—
Other stations	...	47	27,647	40	25,554	—	517	4	5,712	64	63,260
		330	193,325	338	230,996	242	235,023	266	284,884	552	598,863
GRAIN.											
Dar-es-Salaam	...	441	39,883	226	20,281	—	—	570	145,481	1,113	181,822
Tanga	...	5	369	6	454	418	51,578	623	113,653	106	35,419
Mwanza	...	—	—	—	—	235	28,893	110	30,824	50	14,464
Bukoba	...	—	—	—	—	8	1,721	877	154,581	385	48,336
Lindi	...	224	17,197	144	13,249	—	—	3	911	8,056	862,299
Other stations	...	1,272	99,559	722	59,507	1	118	733	146,394	1,870	221,437
		1,942	157,008	1,098	93,491	662	82,310	2,916	591,844	11,580	1,363,777

Appendix II—continued.

EXPORTS—continued.

Main articles.	1912.		1913.		1917-18.		1918-19.		1919-20.	
	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.	Tons.	Rs.
BEE SWAX										
Dar-es-Salaam ...	197	366,157	401	787,349	157	319,908	210	269,123	176	228,314
Tanga ...	3	5,173	3	5,098	5	9,697	5	7,142	3	5,535
Mwanza ...	21	33,821	24	40,358	61	108,282	21	23,457	40	54,046
Bukoba ...	28	46,204	36	57,352	13	8,704	1	798	1	1,421
Lindi ...	65	113,831	59	107,519	—	—	4	5,319	29	39,667
Other stations ...	33	56,607	36	63,467	2	4,181	28	38,721	25	35,836
	347	621,793	559	1,061,143	238	450,772	269	349,560	274	364,819
SIM SIM (Sesamum).										
Dar-es-Salaam ...	274	56,072	160	36,148	296	90,965	370	88,958	128	41,247
Tanga ...	—	27	—	—	1	164	6	2,109	15	5,191
Mwanza ...	109	17,812	186	32,105	174	27,435	71	20,595	98	36,808
Bukoba ...	—	—	—	—	—	—	—	—	—	—
Lindi ...	588	134,558	555	123,189	—	—	24	5,081	859	273,175
Other stations ...	910	184,320	575	114,666	—	55	171	30,804	553	169,327
	1,881	392,789	1,476	306,108	471	118,619	642	147,547	1,653	525,748
Total values of Exports including Re-exports.	—	23,563,787	—	26,663,286	—	9,514,357	—	10,507,627	—	21,386,068

Appendix III.

The following table shows the number of European Government Officials invalided in the years 1917-20, with cause of invaliding.

Diseases.	1917.	1918.	1919.	1920 to end of Oct.	Total.
1. General Debility	—	1	3	3	7
2. Anæmia	1	1	—	1	3
3. Malaria	—	—	2	2	4
4. Blackwater Fever	—	—	2	2	4
5. Relapsing Tick Fever	—	—	1	—	1
6. Chronic Amœbic Dysentery	—	—	—	1	1
7. Pulmonary Tuberculosis	—	—	1	1	2
8. Meningitis	—	—	—	1	1
9. Neurasthenia	—	2	3	4	9
10. Insomnia	—	—	—	1	1
11. Loss of Vision	—	—	1	—	1
12. Chronic Osteo Myelitis	—	—	1	—	1
13. Divided Tendon	—	—	—	1	1
14. Bullet wound of foot	—	—	—	1	1
15. Valvular disease of heart	—	—	—	1	1
16. Epididymitis	—	—	—	1	1
17. Perineal Fistula	—	—	—	1	1
	1	4	14	21	40

Appendix IV.

The following table shows the number of Asiatic Government Officials invalided in the years 1917-20, with cause of invaliding.

Diseases.	1917.	1918.	1919.	1920 to end of Oct.	Total.
1. Malaria	—	—	4	4	8
2. Blackwater Fever	—	1	4	5	10
3. Tuberculosis	—	—	2	2	4
4. Syphilis	—	—	—	2	2
5. General Debility	—	—	2	4	6
6. Chronic Rheumatism	—	—	—	1	1
7. Anæmia	—	—	1	3	4
8. Dyspepsia	—	—	1	—	1
9. Fistula	—	—	—	1	1
10. Hepatitis	—	—	—	1	1
11. Acute Nephritis	—	—	—	1	1
12. Cystitis	—	—	—	1	1
13. Chronic Bronchitis	—	—	1	1	2
14. Neurasthenia	—	—	—	1	1
15. Loss of Vision	—	—	—	1	1
16. Insanity	—	—	—	1	1
17. Unknown	—	—	1	1	2
	—	1	16	30	47

Appendix V.

Table showing deaths of European Government Officials during 1918-20.

	1918.	1919.	1920. To October 31st.	Total.
Blackwater	—	—	4	4
Cerebral Malaria	—	—	1	1
Diabetic Coma	1	—	—	1
Sunstroke	—	1	—	1
Heart failure	—	4	—	4
Suicide, Temporarily insane ...	—	1	—	1
	1	6	5	12

Appendix VI.

Table showing deaths of Asiatic Government Officials during 1919-20.

	1919.	1920. To October 31st.	Total.
Blackwater	—	8	8
Meningitis	—	1	1
Heart Disease... ..	1	—	1
	1	9	10

Appendix VII.

Statement shewing the Telegraph Traffic dealt with in Tanganyika Territory during the period 1/4/19 to 31/3/20.

	Paid State	Number of	
		Telegrams.	Words.
INLAND TELEGRAMS (including those exchanged with Kenya Colony).	54,532	981,576	
	49,052	1,226,300	
CABLEGRAMS... ..	Forwarded { Paid	16,548	231,672
	State	1,572	44,016
	Received { Paid	16,668	233,352
	State	1,344	37,632
TELEGRAMS EXCHANGED WITH NYASALAND (A.T.T. Co.'s system).	Forwarded State	2,340	65,520
	Received State	2,640	73,920
TELEGRAMS EXCHANGED WITH BELGIAN ADMINISTRATION (Tanganyika Territory).	Forwarded	2,688	48,384
	Received	2,400	43,200
Total	149,784	2,985,572	

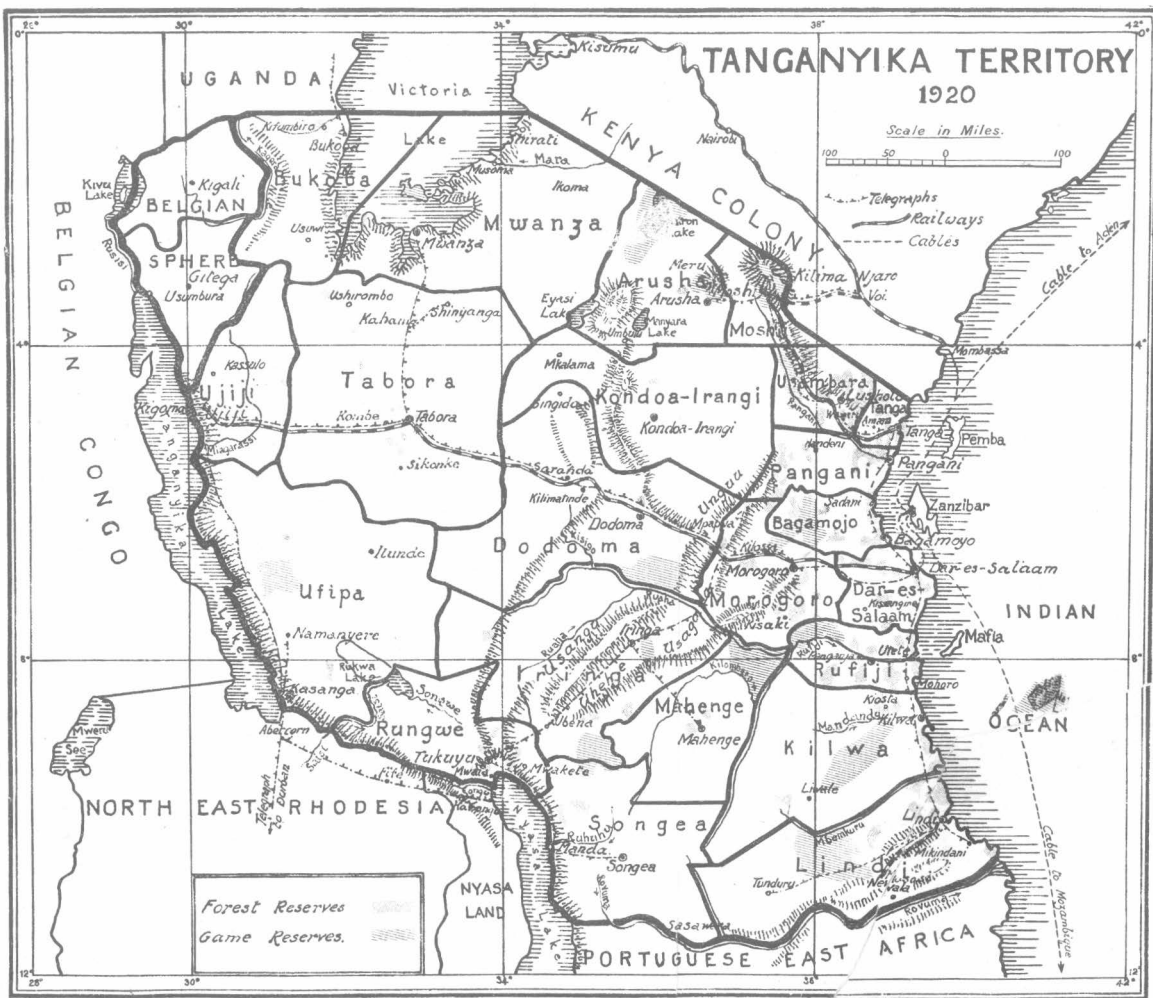
Appendix VIII.

LIST OF POST OFFICES IN TANGANYIKA TERRITORY

<ul style="list-style-type: none"> † Amani. * Arusha. * Bagamoyo. <li style="padding-left: 20px;">Bahi. * Bismarckburg (renamed Kasanga) * Buiko. * Bukoba. * Dar-es-Salaam. * Dodoma. † Gulwe. † Handeni. * Iringa. † Itigi. † Kahama. <li style="padding-left: 20px;">Kidette. <li style="padding-left: 20px;">Kidugallo. <li style="padding-left: 20px;">Kihuhui. <li style="padding-left: 20px;">Kikombo. * Kilossa. * Kilwa. <li style="padding-left: 20px;">Kimamba. <li style="padding-left: 20px;">Kondoa-Irangi. * Korogwe. * Lindi. <li style="padding-left: 20px;">Lulanguru. <li style="padding-left: 20px;">Lutembo. † Mahenge. <li style="padding-left: 20px;">Makuyuni. † Malangali. † Massoko. <li style="padding-left: 20px;">Mbulu. † Mikesse. 	<ul style="list-style-type: none"> * Mikindani. <li style="padding-left: 20px;">Milow (renamed Milo). <li style="padding-left: 20px;">Mkumbara. <li style="padding-left: 20px;">Mnyussi. * Mohoro. * Mombo. * Morogoro. * Moshi. <li style="padding-left: 20px;">Mpapna. * Muansa. * Muheza. <li style="padding-left: 20px;">Musoma. † Mwaya. † Ngerengere. * Ngomeni. * New Langenburg (renamed Tukuyu). * Pangani. <li style="padding-left: 20px;">Pongwe. † Euvu. * Sadani. † Saranda. † Shinyanga. <li style="padding-left: 20px;">Siagidda. <li style="padding-left: 20px;">Soga. † Songea. * Tabora. † Tandala. * Tanga. † Wiedhafen (renamed Manda). * Wilhelmstal (renamed Lushoto).
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* Telegraph Offices open for International traffic.

† Telegraph Offices open for Inland traffic only.



TANGANYIKA TERRITORY 1920

Scale in Miles.



Telegraphs
Railways
Cables

Forest Reserves
Game Reserves.