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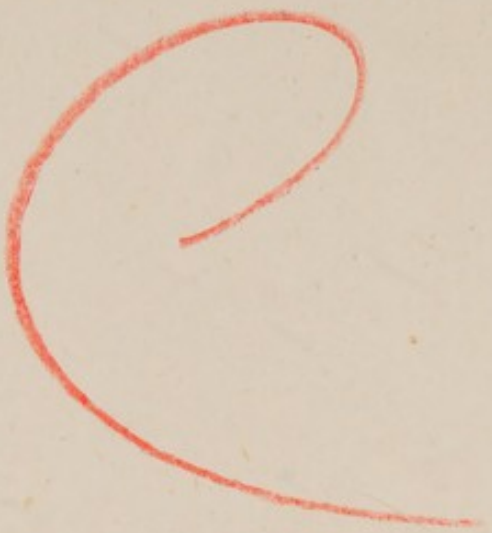
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THE BELGIAN CONGO

NAVAL INTELLIGENCE DIVISION



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THE BELGIAN CONGO

APRIL 1944

NAVAL INTELLIGENCE DIVISION

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PREFACE

IN 1915 a Geographical Section was formed in the Naval Intelligence Division of the Admiralty to write Geographical Handbooks on various parts of the world. The purpose of these Handbooks was to supply, by scientific research and skilled arrangement, material for the discussion of naval, military, and political problems, as distinct from the examination of the problems themselves. Many distinguished collaborators assisted in their production, and by the end of 1918 upwards of fifty volumes had been produced in Handbook and Manual form, as well as numerous short-term geographical reports. The demand for these books increased rapidly with each new issue, and they acquired a high reputation for accuracy and impartiality. They are now to be found in Service Establishments and Embassies throughout the world, and in the early years after the last war were much used by the League of Nations.

The old Handbooks have been extensively used in the present war, and experience has disclosed both their value and their limitations. On the one hand they have proved, beyond all question, how greatly the work of the fighting services and of Government Departments is facilitated if countries of strategic or political importance are covered by handbooks which deal, in a convenient and easily digested form, with their geography, ethnology, administration, and resources. On the other hand it has become apparent that something more is required to meet present-day requirements. The old series does not cover many of the countries closely affected by the present war (e.g. Germany, France, Poland, Spain, Portugal, to name only a few); its books are somewhat uneven in quality, and they are inadequately equipped with maps, diagrams, and photographic illustrations.

The present series of Handbooks, while owing its inspiration largely to the former series, is in no sense an attempt to revise or re-edit that series. It is an entirely new set of books, produced in the Naval Intelligence Division by trained geographers drawn largely from the Universities, and working at sub-centres established at Oxford and Cambridge, and is printed by the Oxford and Cambridge University Presses. The books follow, in general, a uniform scheme, though minor modifications will be found in particular cases; and they are illustrated by numerous maps and photographs.

The purpose of the books is primarily naval. They are designed first to provide, for the use of Commanding Officers, information in a comprehensive and convenient form about countries which they may be called upon to visit, not only in war but in peace-time; secondly, to maintain the high standard of education in the Navy and, by supplying officers with material for lectures to naval personnel ashore and afloat, to ensure for all ranks that visits to a new country shall be both interesting and profitable.

Their contents are, however, by no means confined to matters of purely naval interest. For many purposes (e.g. history, administration, resources, communications, &c.) countries must necessarily be treated as a whole, and no attempt is made to limit their treatment exclusively to coastal zones. It is hoped therefore that the Army, the Royal Air Force, and other Government Departments (many of whom have given great assistance in the production of the series) will find these Handbooks even more valuable than their predecessors proved to be both during and after the last war.

J. H. GODFREY
Director of Naval Intelligence
1942

The foregoing preface has appeared from the beginning of this series of Geographical Handbooks. It describes so effectively their origin and purpose that I have decided to retain it in its original form.

This volume has been prepared by the Oxford sub-centre of the Naval Intelligence Division under the direction of Lieut.-Colonel K. Mason, M.C., M.A., R.E., Professor of Geography in the University of Oxford, and is the work of a number of contributors, whose names are given on page 519.

E. G. N. RUSHBROOKE
Director of Naval Intelligence
APRIL 1944

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CHAPTER I

INTRODUCTION

THIS volume deals with all the Belgian territory in Africa, consisting of the colony of the Belgian Congo and the mandate of Ruanda-Urundi. From an ancient kingdom of Congo the name was transferred to the river and then to the French and Belgian colonies in its basin.

There are many astonishing facts about the Belgian Congo, but no single one so striking as the contrast between its youth and its present share in the activities of a civilized world. The Congo basin, guarded by its encircling highlands, sheltering within its dense forest, and inaccessible from the sea, remained unknown to Christian and Moslem alike till three-quarters of a century ago. To-day the Belgian Congo stands fifth among the copper-producing countries, has the largest alluvial diamond fields in the world, and is one of the most important exporters of vegetable oils and fats. Thousands of miles of waterways, important airways and railways, and passable roads carry goods to the Atlantic and Indian oceans. Yesterday the Congolese Bantu, still unfound and untouched by any superior civilization, scratched his fields with a primitive hoe. To-day he may work in a garage, an engine-room, or a mine, whilst his wife, in patterned cottons, may cook on an oil stove. Yet in forest clearing or remote valley there are still many—Bantu or pygmy—who have seen no white man other than the local administrator.

In area this Belgian colony (902,000 sq. miles) is eighty times as large as the mother country, and its population is only 25 per cent. greater (Fig. 1). Belgium has 728 inhabitants to the square mile; the Belgian Congo with 10,354,000 inhabitants, of whom one in each 400 is European, has only 11·3. War, migration, slave-raiding, and pestilence have been as active here as in any part of Africa. Ruanda-Urundi, 20,500 square miles, is comparatively small, but is much more densely populated. With 3,784,000 inhabitants it has 184 to the square mile.

The forest seems to be the natural, but is perhaps only the last and final, home of the pygmies, of whom some 25,000 to 30,000 live their primitive lives within its remote security. The vast bulk of the native population belongs to the Bantu-speaking family. In the north-eastern corner the Azande and other tribes have nilotic affinities and

miles from east to west and nearly 500 miles from north to south. These are the haunts of pygmies, okapi, gorillas, and the tsetse-fly.

The Congo river, sixth among the great rivers of the world, swollen by its tributaries now from the north and now from the south, is the important highway through the forest. Yet neither the Congo nor any of its tributaries can be ascended by sea-going craft. Like all African rivers it has its falls, cataracts, and rapids, and, inside the basin, two pronounced steps, bordering comparatively recent depressions, break navigation on all the rivers of the south and east.

The Congo basin is a depression in the meteorological, as well as the topographical, sense. As the steamy air rises, so do the winds, blowing in from all directions, bring fresh rain. Within the equatorial zone there is no dry season, and a damp monotony obtains. As the depression lifts to its encircling hills the growing height cools the nights, whilst southwards as latitude increases, and equatorial conditions give place to tropical, a dry season appears, and, by its tonic, makes European life more possible.

Malaria and sleeping-sickness are the twin scourges of the afforested plain, yet in no part of Africa has medical science struggled harder, or achieved more, in a lifetime. Moreover, for Europeans the refrigerator and the internal combustion engine have transformed life. In the days when the west coast was the white man's grave the Congo forest would have been his purgatory.

The history of the Congo since Europeans set foot in it is as much a matter of superlatives as are its physical and climatic attributes. Born in that scramble to secure what was left of Africa after the slow infiltration of sea-faring peoples, burdened with the sheer necessity of raising funds for preliminary development, beset by native revolt and slave-trading opposition, interrupted by the two greatest wars of history, and hampered by lack of population, yet the Belgian Congo emerges as an indispensable member of the present world, rich in agricultural and mineral resources.

History begins in 1482 with the discovery of the Congo mouth by the Portuguese captain Diego Cam. There followed the period of the slave trade. Then came the explorers Livingstone and Stanley, the entry into the basin itself, and the foundation of the Congo Free State through the initiative of King Leopold II of Belgium. From 1884 to 1908 the International Association, and then the Congo Free State, owned the land, which came under the direct and personal rule of King Leopold. Nationals of many lands assisted in the administration and development. Large areas became the almost

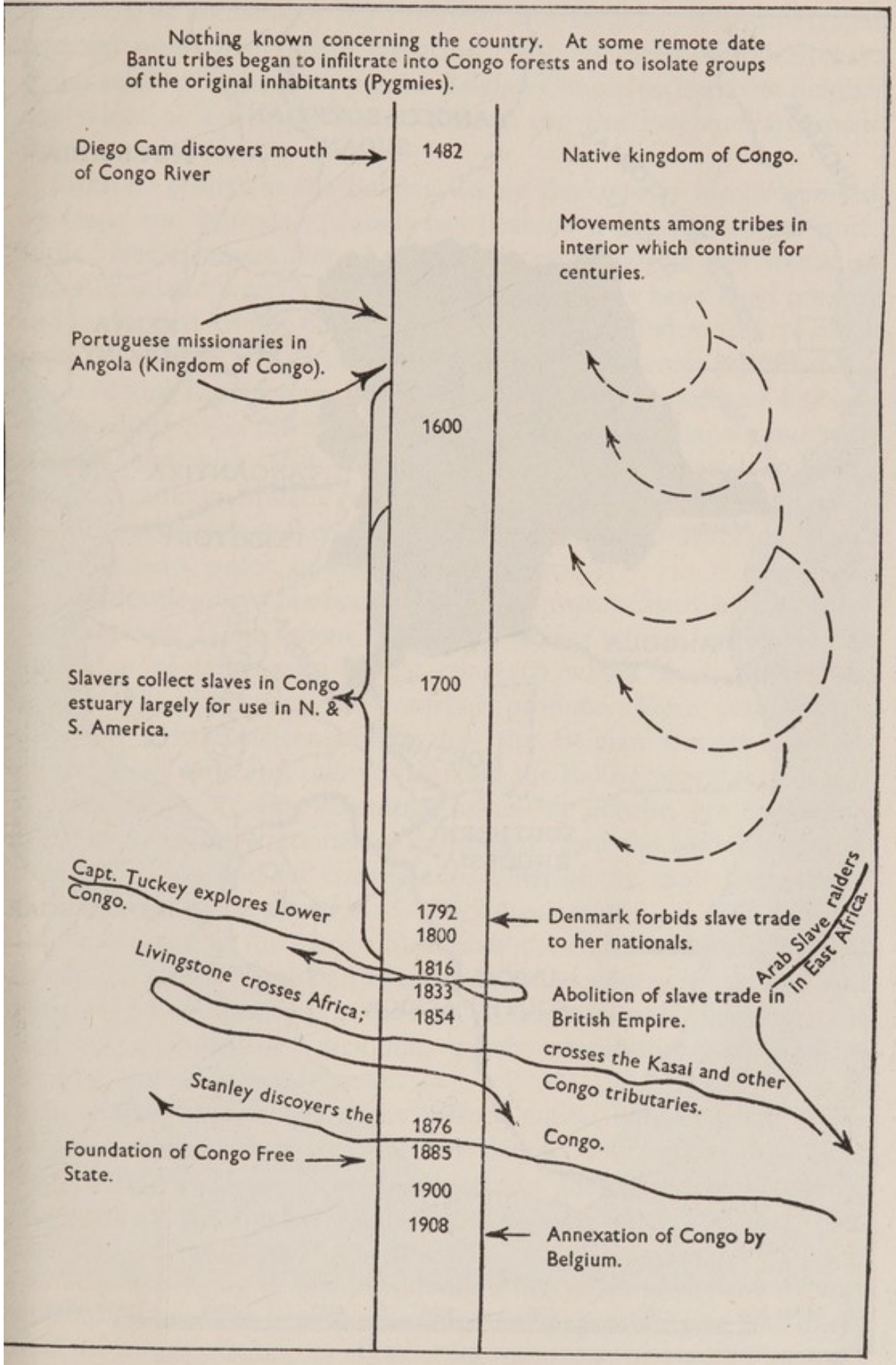


FIG. 3. *Time Scale*



FIG. 4. *Belgian Congo and its Approaches*.

independent domains of Big Business, and Belgium itself, interested perhaps more than other countries, had no direct responsibility. From 1908 to the present day the Belgian Congo has been the Belgian equivalent of a British Crown Colony and the Belgian Parliament rules, constitutionally, over it.

From its rebirth as the Belgian Congo the country has progressed by leaps and bounds. Matadi has become a great maritime port, while river steamers from Leopoldville range over a few thousand miles of inland waters. Rail, road, and air ways have been created and multiplied. Some of these tend, naturally, to follow outlets other than the Congo. Thus the Lobito Bay railway serves much of the trade of the Katanga; railways to Cape Town, Beira, and Dar-es-Salaam all share in the traffic, and there is road and water contact with Uganda and with Alexandria and the Mediterranean, but purely Belgian traffic to Matadi grows quickly at the expense of other outlets. In the pocket at the end of the book is a map of the communications, by land, water, or air, within the territory.

This development has been achieved in great measure by a partnership between Government and Big Business which has led to the formation of large semi-official concerns which work the mines, cultivate the plantations, and transport produce. More, and quicker, than any other African colony has the Belgian Congo attracted capital, both state and individual, from the mother country.

Many of the trading concerns, official or private, are constantly referred to under short names composed from the initial letters of their full titles, and for convenience a list of the most common of these is given as an appendix to this introduction.

The creation of the Congo Free State coincided with that wave of humanitarianism which had already abolished slavery in the west and was bent on doing so also in the east. It is but natural, therefore, that missionary enterprise, including much educational and medical activity, should be widespread.

In the two great wars of its history native Belgian troops have played a distinguished part. In the defence of freedom they have fought and marched to the Indian ocean and to the highlands of Abyssinia, whilst the agricultural and mineral exports to the Allies have been of the greatest service.

At the beginning of this introduction the youth of the colony was stressed. There has been neither time nor opportunity to take exact stock of its population, its climate, its resources, or even of its area. To give the population of a district to a single unit, the rainfall to

a decimal of an inch, the number of oil palms to a single tree, or even the total area to the nearest square mile would all be ridiculous. There is enough evidence upon which to appreciate the broad facts; there is not enough to enable us to judge between differing authorities.

Naturally, authoritative surveys cover but a small portion of this vast, and, for mapping, exceedingly difficult territory. Excellent work has been done in Katanga. For the rest, positions may be in error, and height may be a hundred feet or so from the truth. The topographical map in the end pocket must, then, be regarded for what it is—a good compilation from often shaky material. In indexing places the latitudes and longitudes of this map have been used.

As a general rule metric measures have been converted to British. In certain cases, however, they have been retained as having local importance. Thus the kilometre posts on the railways are often used in descriptions of localities, and railway distances remain, therefore, in kilometres. Conversion tables will be found at the end of the book.

APPENDIX TO INTRODUCTION

Abbreviated Titles

Businesses, firms, and societies, official or private, active in the Belgian Congo generally pass under a nickname, or abbreviated title, made from a selection of first letters, initials, or syllables. The titles given below are those used, or referred to, in this book.

A.B.C., Compagnie Commerciale et Agricole d'Alimentation du Bas-Congo.

ABIR, Anglo-Belgian India-Rubber Co.

AGRICOMIN, Société d'Agriculture et d'Élevage de la Région Minière du Haut-Katanga.

AGRIFOR, Société Forestière et Agricole du Mayumbe.

ATENA, Ateliers et Chantiers Navals du Stanley-Pool.

BANACO, Bananeraies Congolaises.

B.C.K., or BECEKA, Compagnie du Chemin de Fer du Bas-Congo au Katanga. The title is applied also to its Société Minière.

BELGIKAOR, Mines d'Or Belgika.

B.O.A.C., British Overseas Airways Corporation.

CADEC, Compagnie Africaine d'Entreprises Commerciales.

CADULAC, Centres Agronomiques de l'Université de Louvain au Congo.

CATANGA, Société Cotonnière du Tanganika.

C.B.M.C., Compagnie Belge Maritime du Congo.

C.C.B., Compagnie du Congo Belge.

C.C.F.C. (sometimes shortened to C.F.C.), Compagnie du Chemin de Fer du Congo.

CEFAKI, Société des Chemins de Fer du Kivu.
CEMUBAC, Centre Médical de l'Université de Bruxelles au Congo.
C.F.A.O., Compagnie Française de l'Afrique Occidentale.
C.F.G.L. (sometimes shortened to C.F.L.), Compagnie du Chemin de Fer du Congo Supérieur aux Grands Lacs Africains.
C.F.K., Compagnie du Chemin de Fer du Bas-Congo au Katanga.
CHANADO, Chantier Naval de N'Dolo.
CHANIC, Chantier Naval et Industriel du Congo.
C.I.M., Compagnie Commerciale, Industrielle et Minière.
CIMCO, *see* IMMOCONGO.
CIMNOKI, Compagnie Immobilière du Nord du Kivu.
CITAS, Compagnie Industrielle et de Transports au Stanley-Pool.
C.M.B., Compagnie Maritime Belge Lloyd Royal.
C.N.KI., Comité National du Kivu.
COLECTRIC, Société Coloniale d'Électricité.
COLOMINES, Société Coloniale Minière.
COMBELGA, Compagnie Commerciale Belgo-Africaine.
CONSTRUCOL, Société de Constructions Coloniales et Continentales.
COTANGA, Société Cotonnière du Tanganika.
COTONCO, Compagnie Cotonnière Congolaise.
COTONEPO, Société Cotonnière du Nepoko.
C.S.K., Comité Spécial du Katanga.
ELAKA, Compagnie d'Élevage et d'Alimentation du Katanga.
EXFORKA, Exploitation Forestière au Kasai.
FOMULAC, Fondation Médicale de l'Université de Louvain au Congo.
FOREAMI, Fondation Reine Elisabeth pour l'Assistance Médicale aux Indigènes.
FORMINIERE, Société Internationale Forestière et Minière du Congo.
GENEX, Société Générale d'Exportation.
GEOMINES, Compagnie Géologique et Minière des Ingénieurs et Industriels Belges.
GRANDS LACS, *see* C.F.G.L.
H.C.B. (Huileries Congo Belge), *see* HUILEVER.
HUILEVER, Compagnie Réunie des Huileries du Congo Belge et Savonneries Lever Frères.
IMMOCONGO, Compagnie Immobilière du Congo.
INEAC, Institut National pour l'Étude Agronomique du Congo Belge.
INTERFINA, Intertropical-Comfina (Commerce and Finance).
KASAI, Société Minière du Kasai.
KILO-MOTO, Société des Mines d'Or de Kilo-Moto.
L.K.D., Société des Chemins de Fer Léopoldville–Katanga–Dilolo.
LUEBO, Société Minière du Luebo.
MANUCONGO, Société pour la Manutention dans les Ports du Congo.
OTRACO, Office d'Exploitation des Transports Coloniaux.
OTRAKA, Office Central du Travail du Katanga.

P.E.K., Plantations et Élevages de Kitobola (a subsidiary of C.C.B.).
PETROCONGO, Société des Pétroles au Congo.
PROTANAG, Société Coloniale des Produits Tannants et Agricoles.
REVIMA, Régie du Chemin de Fer du Mayumbe.
S.A.B., Société Anonyme Belge pour le Commerce du Haut-Congo.
SABENA, Société Anonyme Belge d'Exploitation de la Navigation Aérienne.
SADAMI, Service Auxiliaire de l'Assistance Médicale aux Indigènes.
SAGETAIN, Société Générale de l'Étain.
SAMI, Service de l'Assistance Médicale aux Indigènes.
SANGA, Société des Forces Hydro-Électriques de Sanga.
S.E.C., Société de l'Élevage et des Cultures au Congo.
SECLI, Société Équatoriale Congolaise Lulanga-Ikelembo.
SEDEC, Société Anonyme d'Entreprises Commerciales au Congo Belge.
SENAC, Comité d'Études pour la Navigation Aérienne.
SERMIKAT, Société d'Exploitation et de Recherches Minières au Katanga.
SIEFAC, Société Industrielle d'Exploitations Forestières au Congo.
SIMKAT, Société Belge Industrielle et Minière du Katanga.
SNETA, Société Nationale pour l'Étude des Transports Aériens.
SOCCA, Société Commerciale du Centre Africain.
SOCOL, Société Coloniale de Construction.
SOGECHIM, Société Générale Industrielle et Chimique du Katanga.
SOGEFOR, Société Générale des Forces Hydro-Électriques du Katanga.
SOMUKI, Société Minière de Muhinga et de Kigali.
SOREKAT, Société de Recherches et d'Exploitations Aurifères au Katanga.
SYMETAIN, Syndicat Minier de l'Étain.
SYNKIN, Syndicat d'Études et d'Entreprises au Congo.
TEXAF, Société Textile Africaine.
TRABEKA, Société d'Entreprises de Travaux en Béton au Katanga.
TRACOMA, Société pour le Transport et le Commerce en Afrique.
U.M.H.K., Union Minière du Haut-Katanga.
UNATRA, Union Nationale des Transports Fluviaux.
UTEXLEO, Usines Textiles de Léopoldville.
VICICONGO, Société des Chemins de Fer Vicinaux du Congo.

CHAPTER II

PHYSICAL DESCRIPTION AND GEOLOGY

PHYSICAL DESCRIPTION

The African Tableland (Figs. 5 and 6)

AFRICA is, mainly, a tableland with, between it and the encircling ocean, a mere fringe of coastal plain which does not average much more than 20 miles wide. This great continental plateau is higher in the south and east than in the north and west, and in it are those vast depressions which form the basins of the Niger, Nile, Chad, Congo, Zambezi, and Kalahari.

The Belgian Congo lies almost wholly within the basin of the Congo river. In the north and south-east Belgian sovereignty does not reach the watershed ringing the old inland sea whose ancient bed now forms that basin. In the one case French Equatorial Africa, and in the other Portuguese Angola, reach over it, and include tributaries to the Congo or their headwaters. On the other hand, the Belgian Congo extends outside the basin proper on the west, in order to find outlet to the Atlantic, and on the east overtops the watershed as far as the lakes of the Rift valley, and took in Ruanda-Urundi as a mandate subsequent to the War of 1914–1918. None the less, the broad fact remains that the Belgian Congo is, practically, the Congo basin, and that the great river itself and its tributaries shape the land.

The floor of the basin is everywhere less than 1,700 and more than 1,000 feet above sea-level, and slopes gradually upwards to the surrounding highlands. Beyond the watersheds lie the high plateaux of south and east Africa, the Nile valley to the north-east and the Chad basin to the north. On the west, beyond the highly eroded Crystal mountains, the tableland sinks to its coastal strip and then to the Atlantic.

The Congo River

The Congo river, over 2,800 miles in length and draining a basin of nearly one and a half million square miles, rises and runs its course to the sea, wholly within the boundaries of the Belgian Congo, except for that stretch, east and west of Stanley Pool, where French Equatorial Africa touches its right bank. The Congo is surpassed in length

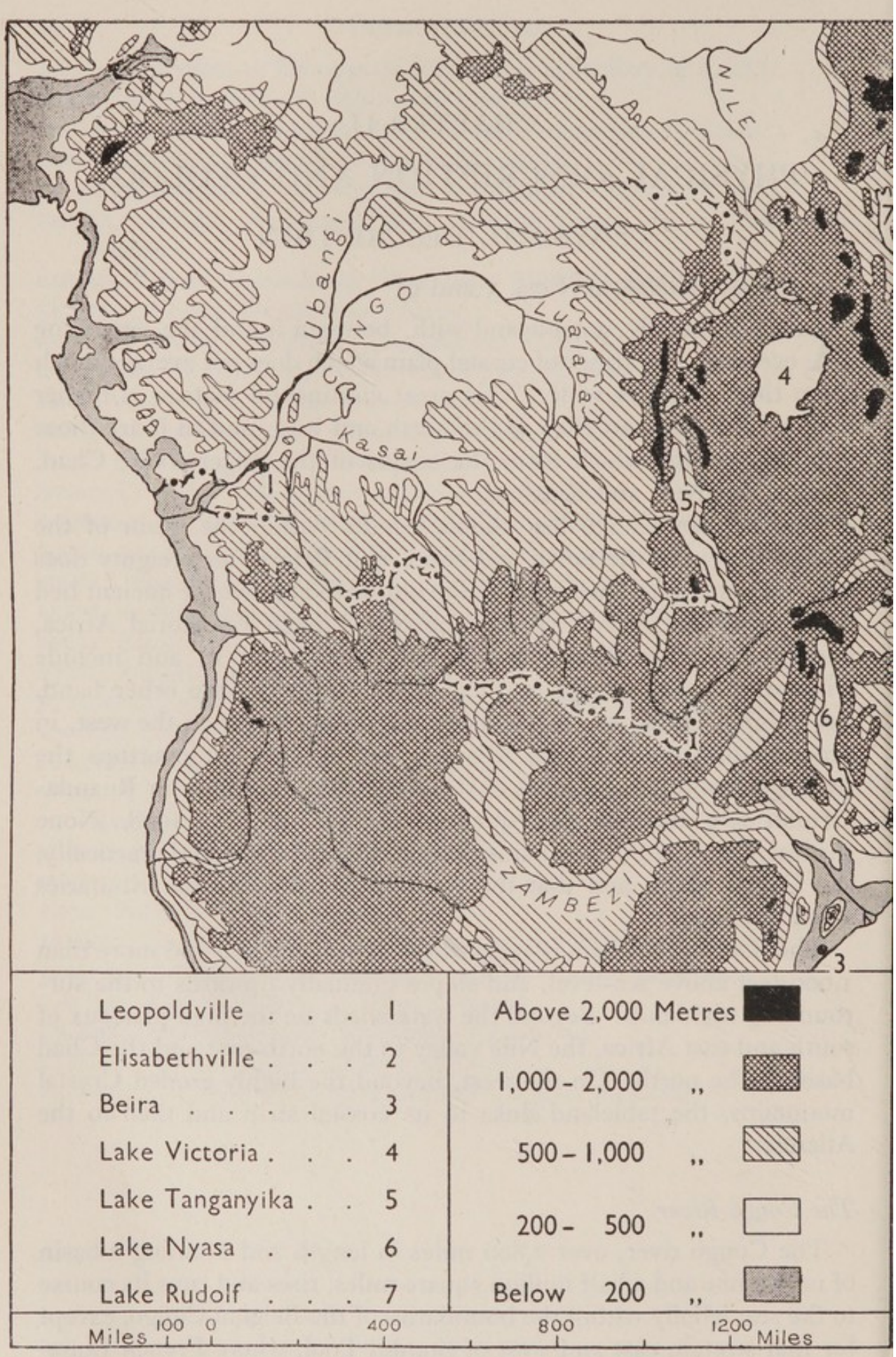


FIG. 5. *General Physical Features, Congo Basin*

by only five other rivers—the Mississippi, the Amazon, the Nile, the Yangtse, and the Yenisei. In the extent of its drainage basin it is surpassed by none, but it does not rank high as an inlet for sea-borne traffic. Like all the rivers of Africa it is broken by falls and rapids, and though it is the main artery of trade in the Belgian Congo, it has to be supplemented by sections of railway to bypass unnavigable stretches.

From its source, in Katanga, at latitude 11° 45′ S. and longitude 26° 30′ E., it flows north to Stanleyville, and is known as the Lualaba. From Stanleyville it curves west and then south-west in a great arc, receiving mighty tributaries on the way, till it reaches Stanley Pool. Below Stanley Pool it falls over a succession of cataracts to Matadi. From Matadi there is clear passage to the sea.

Most tropical rivers have well-marked seasonal differences of level and volume. The Congo, however, spans the equator, and has two full periods, May and December, corresponding to the maximum rainfall of the northern, and of a mixture of the southern and eastern, tributaries respectively. The mean discharge is somewhere between 2 and 2¾ million cubic feet a second.

The Basin (Figs. 2 and 5)

The Congo basin is almost completely sealed, and the only outlet to the sea is a narrow gash across the Crystal mountains through which the great river pours into the Atlantic.

Although, as has been stated, ground rises gradually from the basin floor to the surrounding highlands, there are two rings, or breaks of level, along which lie falls and rapids. The lower break of slope traces out a rough ellipse, the major axis of which runs south-west to north-east. Across the lowest level—the Congo plain and the area of the dense forest—flows the Congo river, from Stanley Falls to not far short of Stanley Pool. In this plain the Congo is joined by great tributaries—Aruwimi, Lomami, Kasai, Ubangi, and Sanga among others—rising in the surrounding highlands. In those regions shadowed by the great tropical forest the surface relief is uniform and monotonous. The tributaries of the river and the river itself flow wide and slow between banks which show few signs of variation. The rivers are entrenched in thick beds of alluvium deposited in the ancient inland sea of which the basin was the bed. Remnants of this sea are to be found in lakes Leopold II and Tumba, and in the marshy land which borders the Congo about the confluences of the Mongala, Lulonga, and Ubangi rivers. The general direction of the tributaries

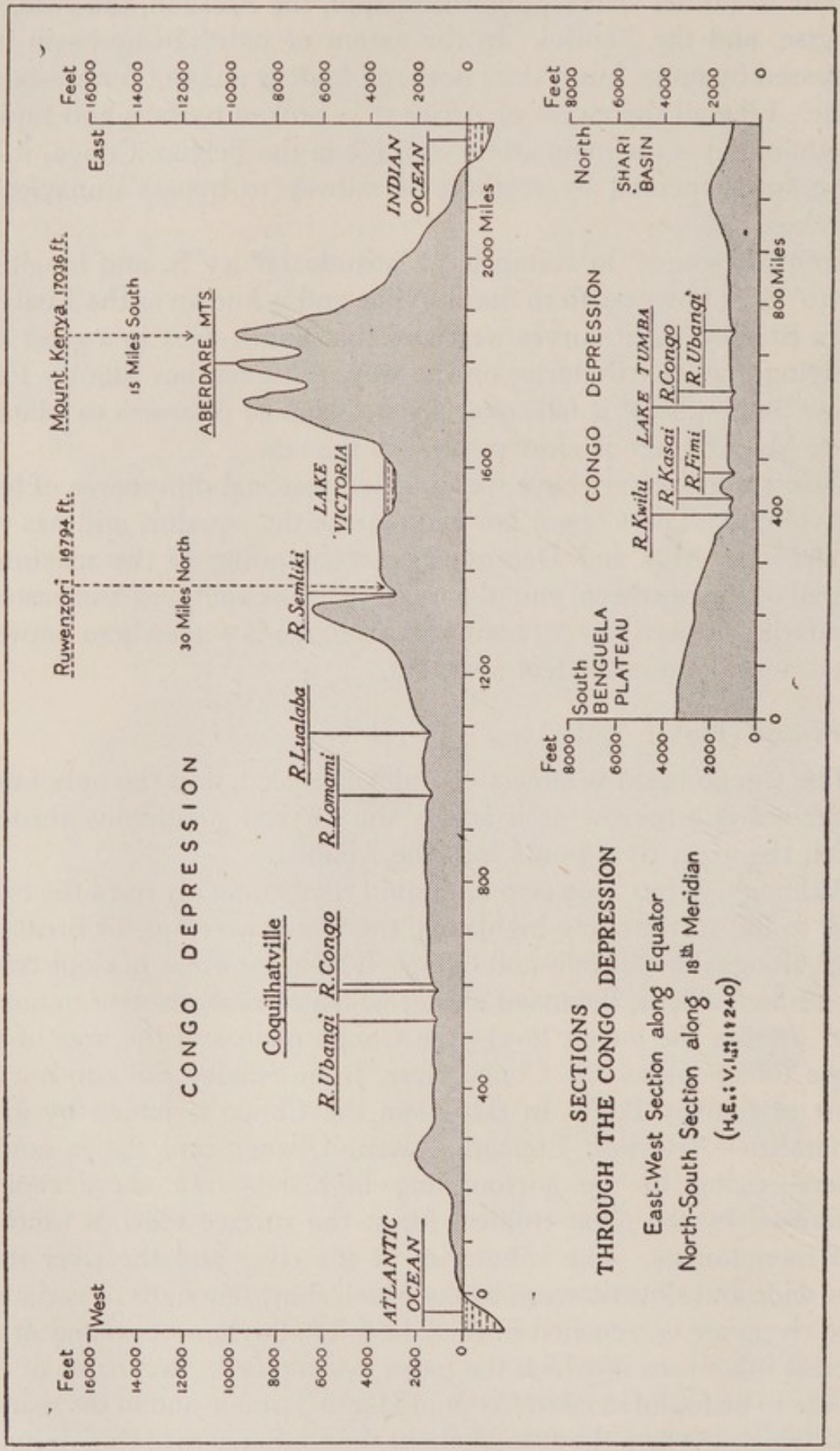


FIG. 6. *Cross-sections of Congo Depression*

which rise on the flanks of the highlands encircling the basin is probably consequent on the retreat of this great sea which seems to have flooded and retreated and flooded again over a portion or portions of the basin. The principal tributaries thus converge towards the deepest parts of the ancient floor.

Along the banks of these many rivers is concentrated much of the human life and activity of the plain. As a matter of official policy and administrative convenience, villages and clearings for agriculture are congregated there. Fish eke out the crops and forest produce, and man, freed from the semi-obscurity of the forest, finds upon the rivers his easiest and most natural highways.

The step up from the lowest level, or Congo plain, to the second is generally abrupt, and marked by rapids. It traces a line above which the thick alluvium beds of the plain are the exception and not the rule.

On the south and east, dominating the first step of the basin, is a second, very roughly semicircular in plan, which stretches from near the confluence of the Kasai with the Congo and continues from west through east to the upper courses of the Uele river, which flows into the Ubangi. Above the rapids the river valleys are no longer broad and wide, as on the plain, but narrow and deeper, whilst the streams are swifter and broken. But for this fact the relief differs little from that of the plain.

The Highland Perimeter

The western barrier, between the basin and the Atlantic, rarely exceeds 3,000 feet in height. Actually Stanley Pool lies within its folds. This highly dissected plateau develops, southwards, into the Angola highlands and from them, eastwards, into the Congo–Zambezi watershed. The divide here is ill defined and lies at about 4,000 feet above the sea. Along it runs the great transverse highway—the old slave road to Benguela. On the east lie the Rift valleys, and, immediately upon their western edge, the summits which define the eastern limits of the basin, and which often surpass 6,000 feet in height. To the north-east the Nile–Congo watershed rises to between 3,000 and 4,000 feet above the sea. From it westwards, and then southwards to the Crystal mountains, the Congo watershed is in French Equatorial Africa and interests us only as a second transverse highway, avoiding to the north, as the Congo–Zambezi watershed does to the south, the forests and swamps of the basin itself.

As the floor of the basin lifts towards the encircling rim, the dense

forest gives place first to open patches of mixed grass and woodland, and then to more continuous, though never wholly bare, grass uplands.

With altitude daily variations of temperature increase, tribal life begins to replace the purely village communities, and a more numerous and varied fauna finds place to roam.

Division into Zones

In describing the physical characteristics of the Belgian Congo it is convenient to take, in order, the following zones.

1. The Coastal Area
2. The Western Barrier
3. The Congo Plain
4. The Southern Highlands
5. The Eastern Highlands
6. The Congo-Nile watershed
7. The Ubangi River.

The Coastal Area

The Sea Coast

The only sea coast belonging to the Belgian Congo is a 20-mile strip, just north of the Congo estuary, extending from Point N'gelo to Banana spit, which points southwards into the estuary. The coast is low, swampy, and thickly wooded, with sandy beaches. In the centre of this 20-mile stretch, red laterite cliffs, 35 feet high, come close to the sea. Moanda lighthouse stands on a promontory of this sort, just south of the reef at Caia point and of the village of Moanda on Mosquito creek. The swamps lying behind the beach between Moanda and Banana spit are deep in mud and covered by mangroves. From the coast the land rises somewhat abruptly to a low plateau. Farther inland and parallel to the coast rises a second and higher plateau which extends to the broken country of the foothills of the Crystal mountains and to Mayumbe. The foothills are 1,500–2,500 feet above sea-level.

Banana sandspit, projecting due southwards for 2½ miles, is about 6 feet above the sea, and tapers from 500 yards at its base to 50 yards at its extremity—French point (Pointe Française). On it is the settlement of Banana, and east of it a sheltered anchorage. It may be noted in passing that Banana was formerly the port of the Belgian Congo and though less used now forms a convenient pilot station for the

navigation of the river as far as Boma or Matadi. A remarkable trough in the sea floor, from 2 to 8 miles broad, and in some places over 800 fathoms deep, extends beyond the mouth of the estuary far into the Atlantic. This marine valley marks the ancient bed of the river, and the coastal plain through which it flowed has been drowned. The Congo has no such delta as those of the Niger or the Nile. The strong river current has pushed aside all obstacles and scoured a deep channel.

This small coastline is washed by the cool Benguela current, and in consequence enjoys a relatively healthy climate with really dry periods.

The Estuary

From the sea to near Matadi, a distance of 80 miles, the southern bank of the Congo is Portuguese. At its mouth, between Banana spit and Ponta Padrão (Shark point) on the southern shore, the estuary is 6 miles wide. On the inner side of Banana peninsula is a deep and capacious inlet called Banana creek and another inlet called Pirates' creek. The former leads to the village of Chimpeza, at the foot of the escarpment. The latter takes a parallel course and has an offshoot to the east joining the estuary near Malela. These creeks are connected and fringed with mangroves. East of Pirates' creek the north bank, which at that place is really a small group of islands, turns south to Bulabemba point, where there is a lighthouse, and reduces the width of the estuary to 2¼ miles. From the islets at Bulabemba point the bank runs east-north-eastward for 8 miles to a point where two islands enclose a channel called Rambler pass which leads to the station of Malela. On the opposite side of the channel, which retains its width of about 2¼ miles, is a point called Jacarés or Scotchman Head, and a little above it lies the Portuguese trading station of Kissanga.

Three miles above Malela, near the northern shore, are some sandbanks, belonging to Belgium and known as Lawrence islands. At this point the channel is only 1½ miles wide but gradually expands farther up to a total width of 10 miles. The Belgian island of Mateba, the Portuguese islands of Bulikoko, Bird Island (Île des Oiseaux) and many other islands and banks lie in this stretch. A farther ascent of some 4 miles from Lawrence islands leads through the north pass to Lenha point (Ponta da Lenha). The course lies between the low swampy portion of the north bank, which is really an island and is called Katala, and the grass thickets of Bulikoko. Ponta da Lenha

means in Portuguese 'Wood Point', and vessels used to call here for wood-fuel. The bank is barely above the level of the stream and has been eaten away by the river in spite of its protecting piles. Lenha point lies just above the mangrove swamps and marks the beginning of the plains. About a mile above the point is the riverside village of Katala. Between Katala point and Boma the river is split by Mateba island. To the north is the Maxwell channel, full of islands and shoals. Steamers proceed upstream along the southern shore of Mateba island as far as the station of Mateba, which contains the headquarters of the Belgian hydrographic service and the principal depot of the Compagnie des produits du Congo. Between Mateba station and Boma the channel crosses to the southern (Portuguese) bank and passes inshore of Bird island. On the south bank appears the remarkable Fetish Rock.

The Belgian shore follows the north bank of the Maxwell channel. As the country becomes drier villages increase. Half-way up the channel the bank rises in small hills near the village of Zambi. The eastern end of Maxwell channel is marked by the granite pinnacle, on the hill-side, called Fingal's Shield. The banks of this stretch of the river as far as Princes' island (Île des Princes), above Boma, are flanked by low hills, three or four hundred feet high. Shinkakasa stands on the slope of these hills and the Belgian river port of Boma, once the capital of the Belgian Congo, and 50 miles from the sea, lies a mile farther upstream, at the foot of rounded, grassy downs. It is connected by railway with Tshela, near the frontier of Cabinda. At Boma the estuary proper ceases.

The River below the Cataracts (Plate 1)

Farther up-stream, hills, about 300 feet high, appear on the south bank, and the river is confined in a deep, sharply curving, valley. The hills increase to over 1,000 feet in height, and the river decreases in width to three-quarters of a mile. A particularly sharp curve, or elbow, just below the port of Matadi has earned the name 'Chaudron d'Enfer' or 'the Devil's Cauldron'. So powerful are the currents and whirlpools in the 'cauldron' that an ocean liner trembles as she passes through, and a small ship may have difficulty in stemming the stream.

Mayumbe Plateau

Before leaving the coastal region mention must be made of the Mayumbe highlands north of Boma. A region and also an adminis-

trative subdistrict take their names from these mountains. The block exceeds 1,000 feet in height, but it does not belong to the Congo drainage system. It has been moulded and carved, and is now drained, by the tributaries of the Chiloango, a river which flows direct into the Atlantic, north of the Congo estuary. The Mayumbe plateau is clothed with tropical rain-forest and is sufficiently far from the coast to lose all benefit from the cool Benguela current.

The Western Barrier

The Crystal Mountains

The western barrier of the Congo basin is that ridge of highlands, extending from Angola to the Cameroons, known, near the Congo itself, as the Crystal mountains. The general direction of the barrier from south-south-east to north-north-west is parallel to the Atlantic coast. It is, in fact, a highly dissected plateau, which has been eroded into a complicated system of hills of varying heights, and into valleys of surprising shapes, by the rivers to which it gives birth. The Congo has found a way through the Crystal mountains. In the distant past a stream which flowed into the Atlantic, more vigorous than its neighbours, gradually pushed back its headwaters until it captured a stream flowing eastward, and by this means tapped, and finally drained, the waters of a great lake in the Congo depression.

In so far as the Belgian Congo is concerned only a small length of the western barrier is of interest; little more, indeed, than the section through which the river now flows. The river itself cuts through the barrier in a deep and narrow gorge which expands in one place to a small plain. This plain has been partly flooded and is now Stanley Pool. Above Stanley Pool the gorge has been given the name of the Channel (Chenal), whilst, below, it becomes the Cataract Region (Région des Cataractes). The river below Stanley Pool is called the 'Lower Congo' (Bas-Congo), and so is the district through which it flows.

The Cataract Region of the Lower Congo (Plate 2)

Between Stanley Pool and Matadi there is a difference of height of 850 feet which is lost in thirty-two cataracts. The cataracts effectively bar navigation except in one short reach (Isangila–Manyanga); and even here only small craft may be used. Immediately above Matadi, tributaries from both sides have carved their valleys through complex systems of steep-sided flat-topped hills. Higher up-stream

the sides of the Congo valley are less precipitous, but through the Crystal mountains immediately below Stanley Pool the features of a canyon appear. In this section tributaries occupy hanging valleys and discharge over falls, or rapids, into the Congo. The river Lubi on the north bank (the 'Edwin Arnold' of Stanley's map) falls 300 feet to the main stream. To gain some idea of the depth of the gorge

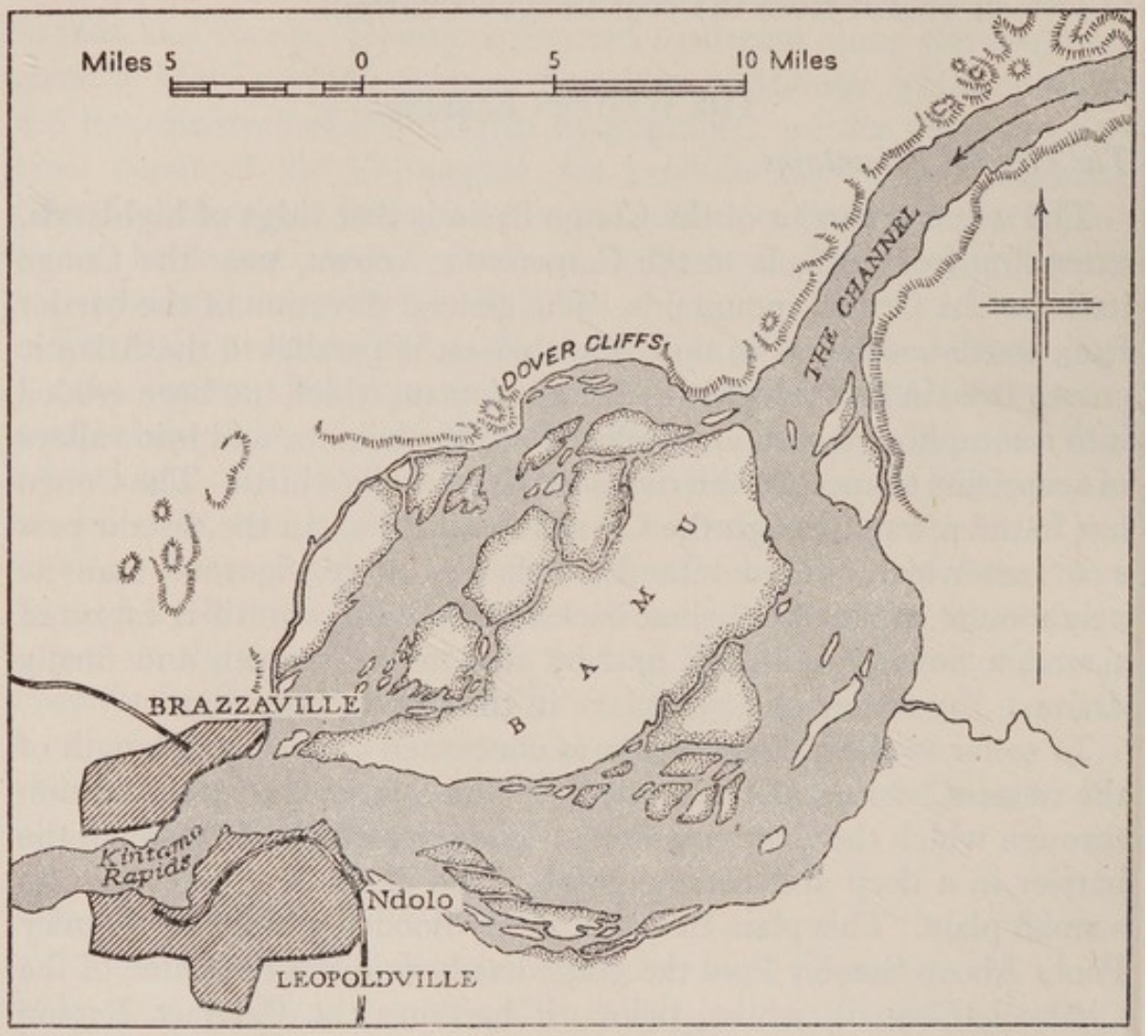
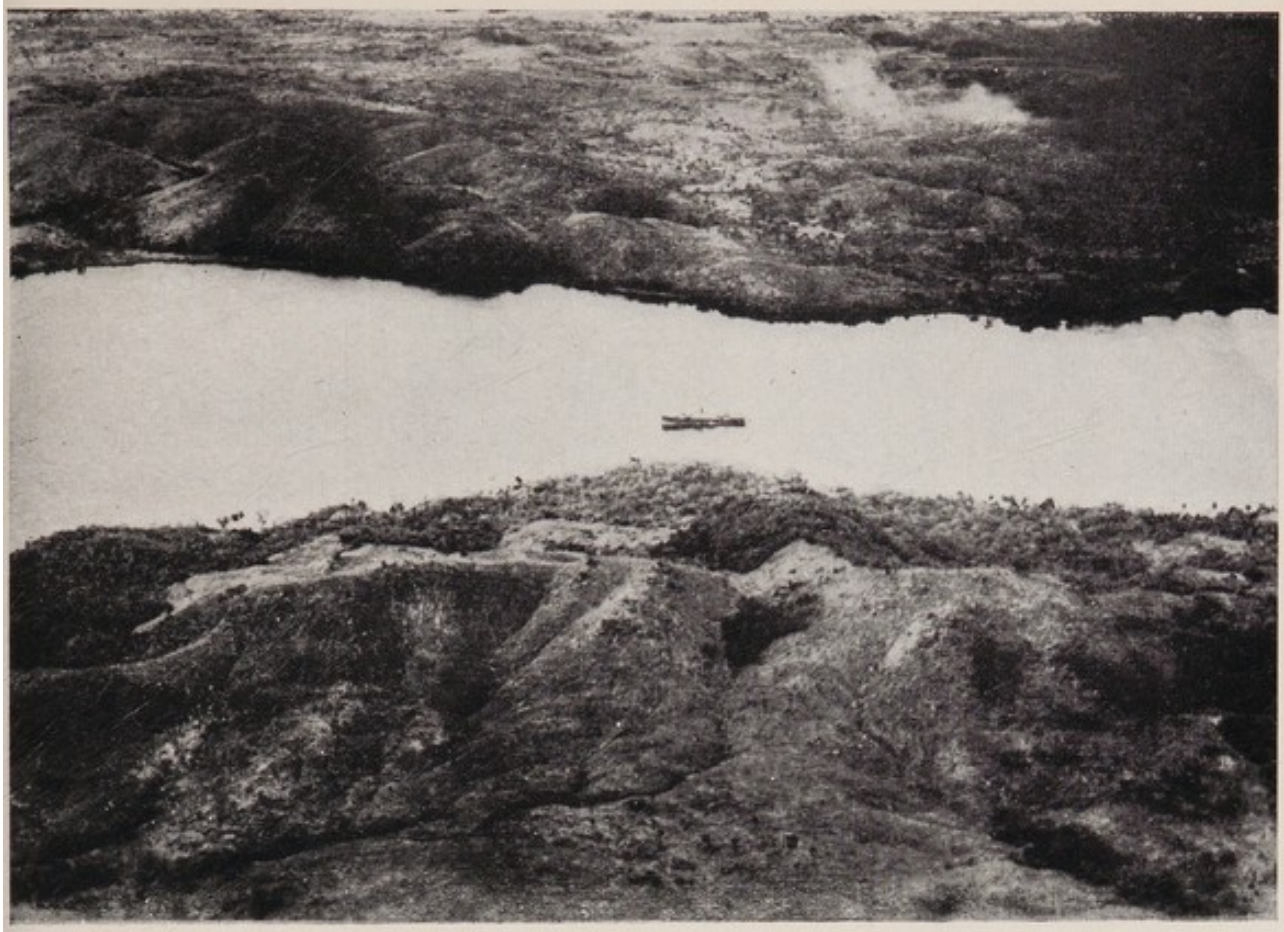


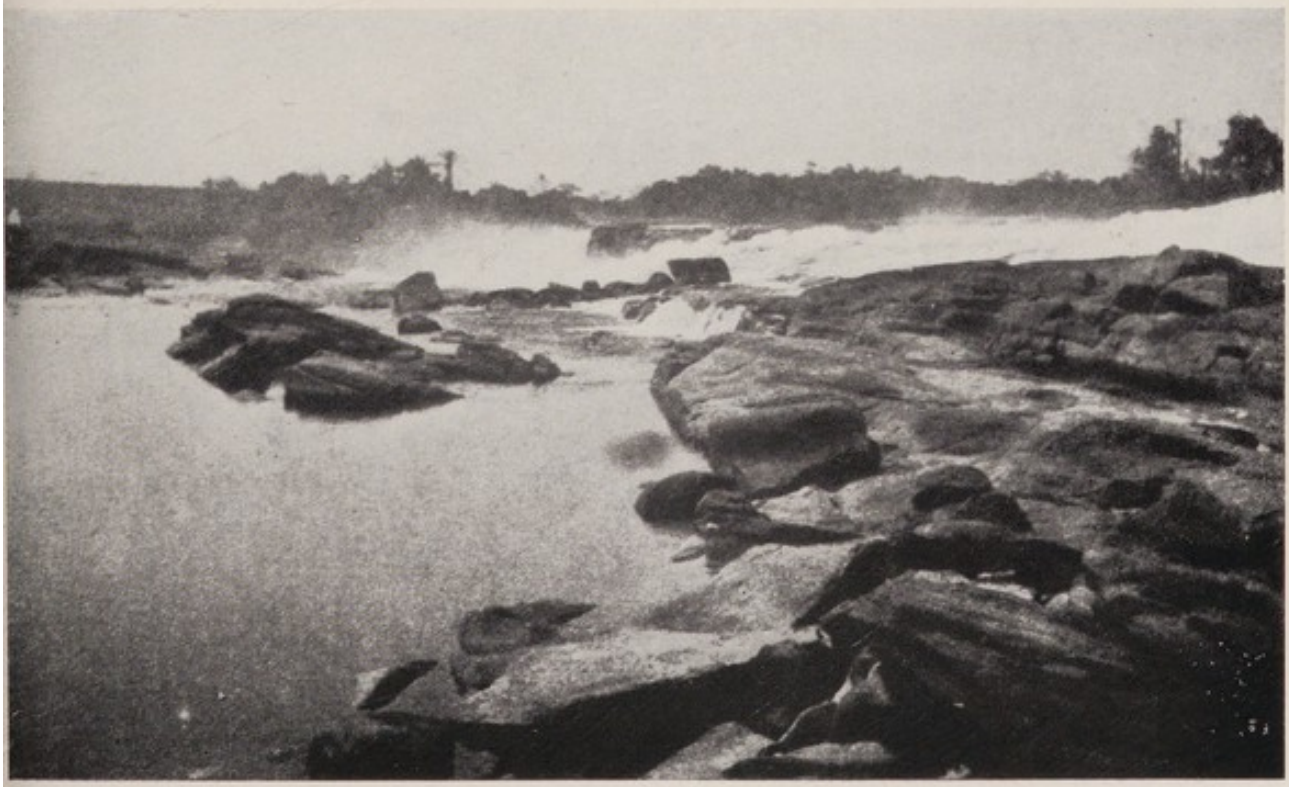
FIG. 7. *Stanley Pool*

through the Crystal mountains it may be noted that at one point (Kendelo) the river is over 1,600 feet below the level of the neighbouring plateau, which rarely exceeds 2,600 feet above the sea. The Palabala hills, just west of Matadi, are 1,800 feet above sea-level. Bangu plateau, north of the railway station of Kimpese, has a mean height of 2,130 feet. Mount Uia, the highest point on that plateau, and also in the region, is 3,445 feet.

Viewed in broad outlines the Cataract region is one of deep and complex relief, which becomes somewhat less pronounced the farther one is from the river, until, at some distance from it, the open plateau



1. *Congo river between Boma and Matadi. Ocean-going steamship making its way upstream*



2. *Rapids below Stanley Pool*



3. *Forest-covered islands in Congo river above Bolobo*



4. *The Congo plain. Meanderings of Giri river, Coquilhatville Province. Dense tropical forest in background*

becomes more conventional. It is for this reason that the railway from Matadi to Stanley Pool does not follow the gorge of the river. Heavy gradients have been avoided and construction rendered less difficult by keeping well to the south.

Stanley Pool (Fig. 7) is the lowest level of the Congo basin and marks the beginning and end of an extensive system of inland navigation. From Leopoldville on the Belgian side, and Brazzaville on the French, shallow-draught steamers can navigate a total of 8,000 miles, whilst canoe traffic extends far beyond that limit in every direction. Stanley Pool is approximately 20 miles long by 14 miles wide. In it the current divides into two arms which encompass the French sand and silt island of Bamu. The southern, or Belgian arm, is from 6 to 20 feet deep, the northern, or French arm, is not less than 10 feet deep and in some places much more. The pool is like a gigantic mill-pond, the outlet of which is just below old Leopoldville at Kintamo rapids (Kintamo is the native name for old, or western, Leopoldville). The rapids discharge into the gorge of the Cataract region. At the head of Stanley Pool, to the north-east of Brazzaville, rise the white sandstone cliffs which were christened by Stanley the 'Dover Cliffs'. Naturally enough the next section of the river was called the 'Channel'.

The Channel

The entrenched valley of the Congo continues through the western barrier for 125 miles above Stanley Pool. The valley itself is not so deep as in the Cataract region. Steep-sided hills rise to 800 feet above the river for some distance upstream of the Pool, but for the last 25 miles the hills are usually less than 400 feet and begin to recede from the water's edge. The average width of the Channel from bank to bank ranges from 1 to 2 miles. At a point 85 miles beyond the pool the Kasai joins the Congo, pouring its immense volume into the main river through a gorge in the rocky hills on the east (Fig. 8).

The Congo Plain

The Middle Congo (Plates 3, 4, 5 and 6)

About Lone island, or 45 miles above Kwamouth, the relief of the country again changes, for here the central plain begins.

In spite of the occasional glades and the small clearings for plantation or for native agriculture, the dense rain-forest, practically speaking, covers the plain. The banks and the many islands of the Congo—

there are said to be four thousand of them—are thickly clad by it. The characteristics of the forest are described in Chapter IV, but a word may be said on its human effects. The main feature, and one infinitely depressing, is the absence of sunlight, for the leafy canopy

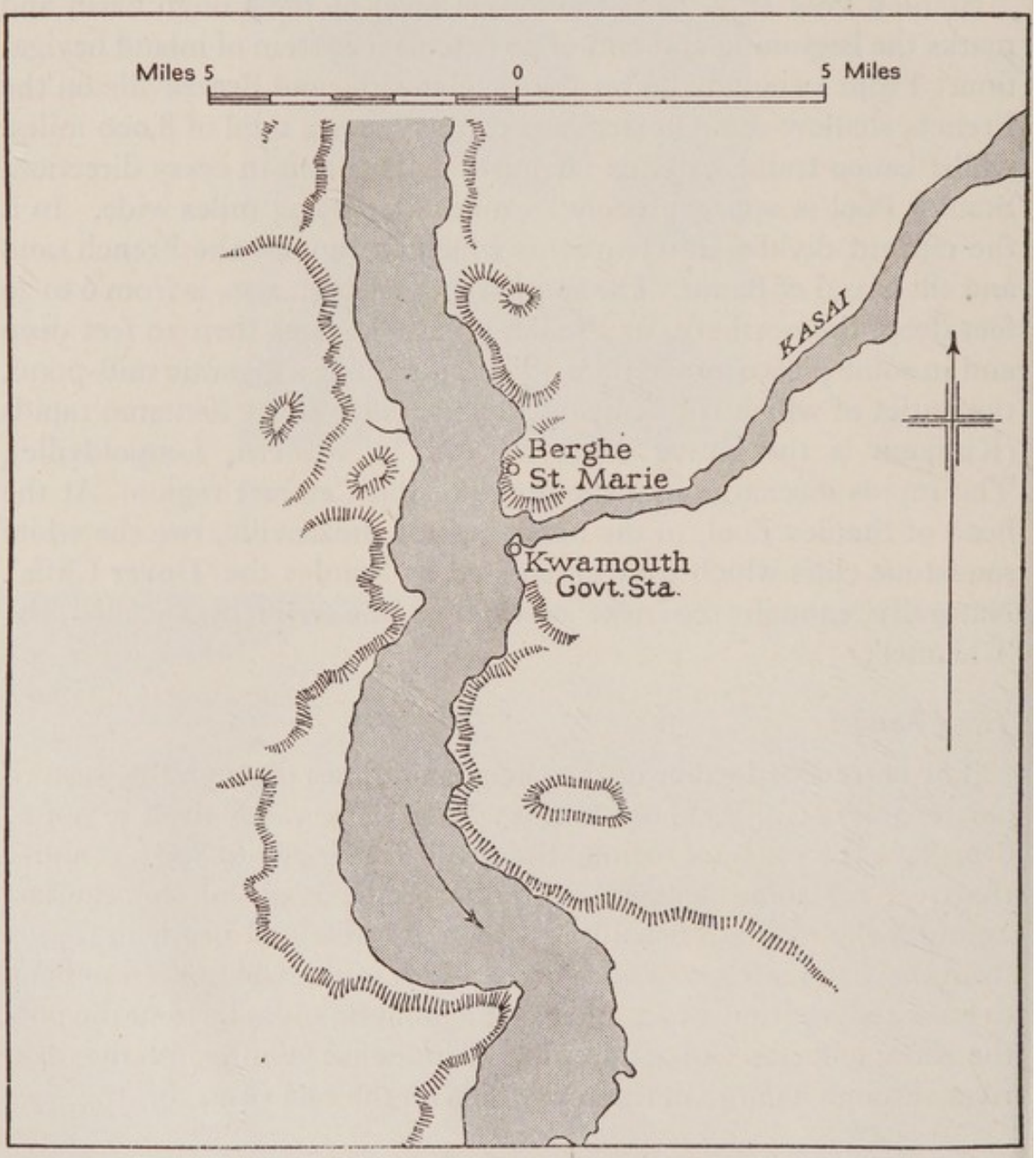


FIG. 8. *Confluence of Kasai and Congo*

is practically continuous. This tropical forest is sometimes called the sponge forest because of the heavy downpours of rain and equally strong evaporation, which are characteristic of it. Vast areas are either water-covered or marsh, and, from the air, glimpses through the canopy detect the waterlogged surface. It is a hard struggle to clear a village site, but it is for such a site that an aeroplane in diffi-

culties must make, for here alone can it land. In this spongy murk each village becomes an entity on its own, for any intercourse is difficult. Cattle cannot survive the tsetse-fly, reptiles and insects flourish, and the larger mammals are rare.

As the plain lifts over the first and then the second step, the true rain-forest ceases. Gallery forests continue to edge the rivers, opener forest clothes much of the country, but the savanna begins to cover larger and larger areas. Life is more that of the tribe than of the village. Ant (termite) heaps become common, there is more game, and a cooling of the night air is more noticeable.

Where the Channel terminates, and where the hills recede, the river expands to a width of 5 miles. The rocks and reefs which are common at the foot of the steep hills in the Channel give place to ever shifting sandbanks which, if not so dangerous to navigation, make it difficult. Above Bolobo the river contracts to less than 2 miles, only to expand again almost immediately to 5–6 miles. In a reach of 100 miles two notable tributaries—the Alima and the Sanga—join the Congo. Both are rivers of French Equatorial Africa. The former rises on the Bateke plateau and the latter far north in the Cameroons. At Lukolela, where dense forest begins, the river is again narrowed by a range of low conglomerate hills. Beyond Lukolela the width of the river expands to 7 miles to narrow again below the delta of the Ubangi. This great tributary, which enters from the north (Fig. 9), is navigable for 375 miles, that is as far as Zongo, and is itself a mile wide near its junction with the Congo. Opposite, on the south bank, at the old government station of Irebu, there is an entrance to, or an outlet from, Lake Tumba (one of the remnants of the ancient lake), according to the season of high or low water in the main river.

Above Irebu the river, now wholly within Belgian territory, expands and contracts but is never less than $2\frac{1}{2}$ miles wide up to Coquilhatville (Stanley's old Equator station), 60 miles from Irebu. At Coquilhatville, on the east bank, the Ruki (or Tshuapa) enters. Together with its tributaries, Lomela, Salonga, and Momboyo, this river contributes a thousand miles to the navigable waterways of the basin.

Two miles above Coquilhatville the Ikelemba enters from the east, and 36 miles still farther upstream the Lulonga joins the main river also from the east. The Lulonga, with its tributaries the Maringa and Lopori, adds over 700 miles of navigable waterways to the grand total. About 30 miles above Nouvelle Anvers a great island, Nsumba (Fig. 10), divides the river into two channels, and the river reaches its

maximum width of at least 9 miles from bank to bank. Beyond Nsumba, the river continues to attract tributaries from north and south. The Mongala, which is navigable for 200 miles, enters from the north, 50 miles above Nouvelle Anvers. At Lisala low hills, about 200 feet high, appear somewhat unexpectedly on the north bank and are the

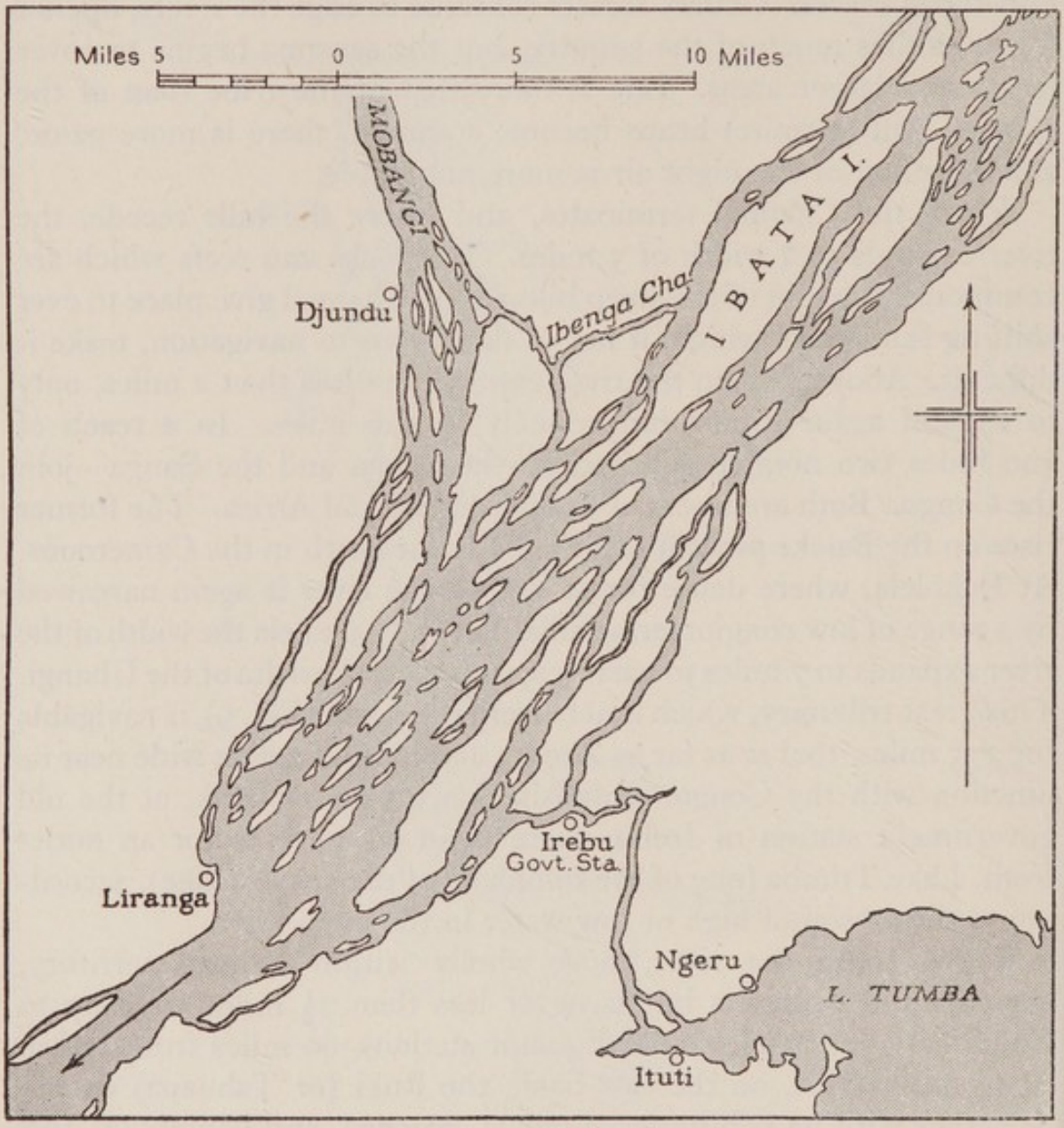


FIG. 9. *Confluence of Ubangi and Congo*

first semblance of highland, except some bluffs at Coquilhatville, for more than 400 miles. Fifty miles upstream the crown of the arc described by the Congo is reached. Heretofore the river has flowed west and south-west, henceforth it flows from the south-east and south as it curves through the upper or northern limit of the Congo plain. The Itimbiri, which enters on the north at the crown of the arc, is a highway to the cotton-growing and gold-producing Uele

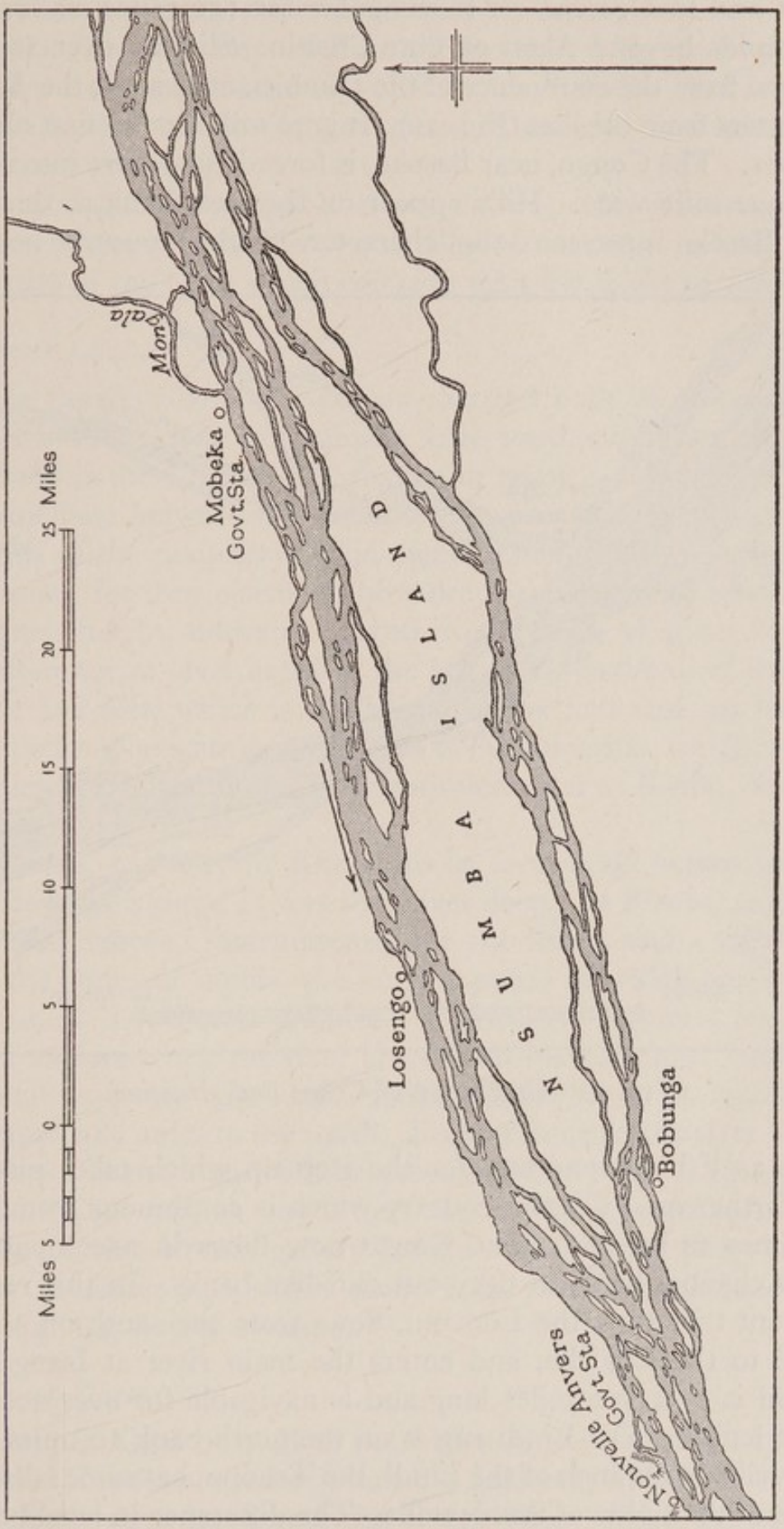


FIG. 10. *Island of Nsumba*

district and to Uganda. It is navigable for 150 miles, as far as the Lubi rapids beyond Aketi or Port Chaltin. Slightly over 100 miles upstream from the confluence of the Itimbiri, at Basoko, the Aruwimi river enters from the east (Fig. 11). It is 70 miles to the first rapids on this river. The Congo, near Basoko, is forced once more into narrows about one mile wide. Hills appear on the west bank at this point. From Basoko upstream the character of the country begins to

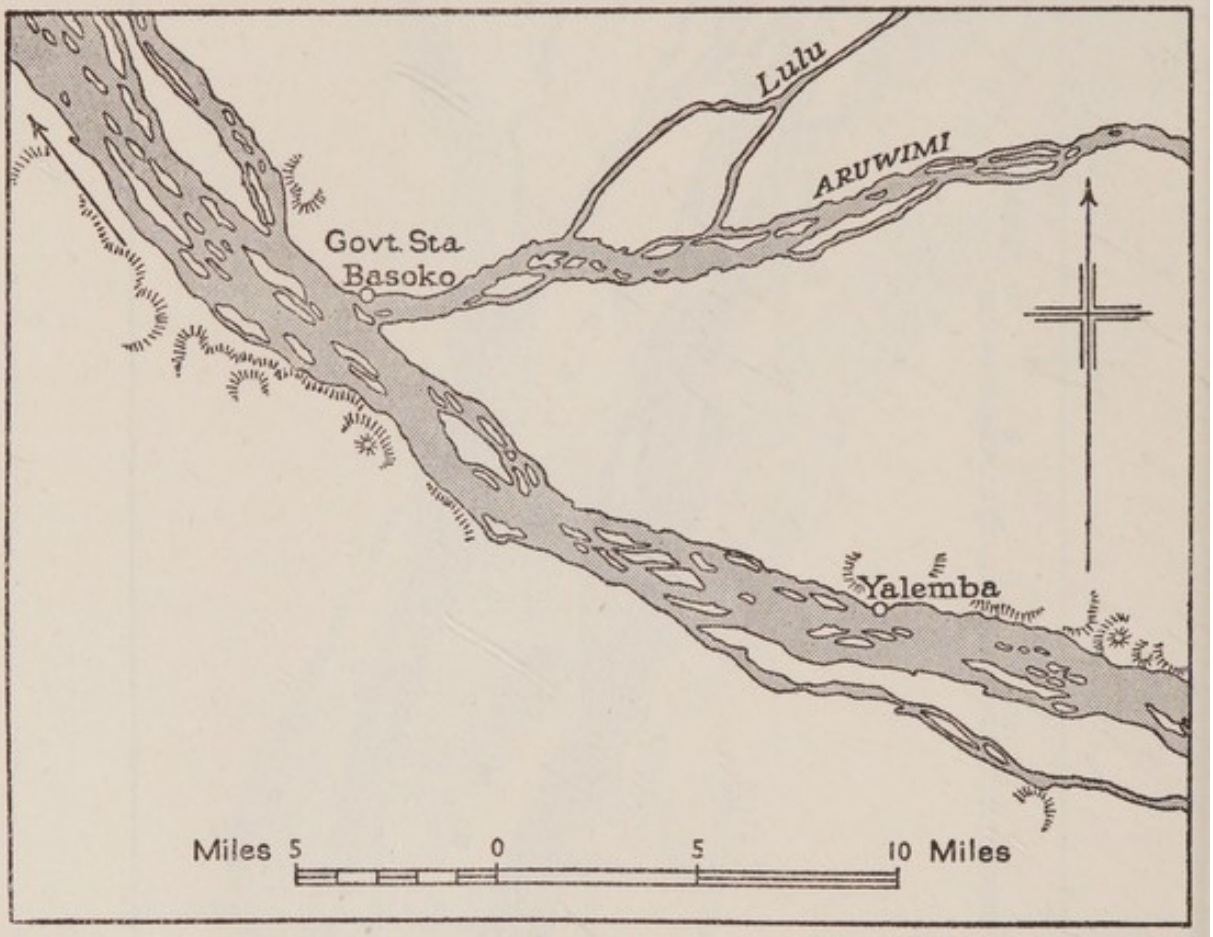


FIG. 11. *Confluence of Congo and Aruwimi*

change as if in preparation for the step up which takes place 120 miles farther on. The flat country which is continuous from Lukolela comes to an end. The Congo now flows in a comparatively narrow channel between deep-cut cliff-like banks. In this reach an important tributary, the Lomami, flows from the south on a course parallel to the Lualaba, and enters the main river at Isangi. The Lomami is over 700 miles long and is navigable for over 200 miles of that length. The Lindi enters on the north bank 10 miles below Stanleyville. A branch of the Lindi, the Tshopo, has some falls which are one of the sights of Stanleyville. The difference in level between Stanleyville and Stanley Pool is only about 510 feet, which gives a

gradient for the main river of about 6 inches a mile or of nearly 1 : 11,000. The first step up from the lower to a higher level occurs at Stanley Falls, at the base of which Stanleyville has been built. At Stanleyville the middle Congo comes to an end, and with it the dense forest (Plate 6).

The catalogue of navigable rivers flowing into the Congo—and those mentioned above are not all—serves as a guide to the boundaries of the plain which coincide with the limits of navigation.

The Lower Lualaba

Above Stanleyville the river has changed both its course and its name: its direction is now almost true south–north and its name henceforth is the Lualaba. A change in relief is also noticeable. It is intermediate between the flat and featureless Congo plain and the highlands of the periphery. The name Stanley Falls is somewhat of a misnomer, for they consist of no more than a series of seven rapids of no great height, unevenly spaced over a reach of about 60 miles. The difference of level between the beginning and end of the reach is about 200 feet, which is the height of the first step up from the Congo plain. Navigation is resumed at Ponthierville, which is linked to Stanleyville by a railway, and continues as far as Kindu, 200 miles upstream.

At Tubila, half-way to Kindu, rocks form a sill across the river which flows in a gorge 45 feet to 60 feet deep. At Kindu, navigation is again interrupted intermittently for 190 miles, and a railway by-passes the series of rapids, the farthest south of which has received the name of 'Les Portes d'Enfer'. Forest now becomes less dense where it occurs at all, the river is confined between high banks, and open plains appear. The Lualaba, above Kongolo, is navigable as far as Bukama, 387 miles to the south. Beyond Bukama the river changes character once more and will be described later. The Lukuga flows from Lake Tanganyika and enters the Lualaba 30 miles north of Kabalo. In this stretch gallery forests still line the river, but the country on either side shows many large areas of grassland. The forest is giving way to savanna.

The Lower Kasai

The upper Kasai belongs to the region of the southern highlands. The lower Kasai, once it has joined the Sankuru, continues its course in a westerly direction across the Congo plain, which exhibits here the same dull uniformity of relief as it does about the main river, and

has the same forest covering. Twenty miles below the junction of the Kwango the Kasai swells out to form Wissmann pool, the home of many hippopotami. The gorge at Kwamouth, through which the Kasai discharges its immense volume of water into the Congo, has already been mentioned. Seventy miles before it does so, however, the Kasai is joined by the Fimi.

Lake Leopold II, the Lukenie, and the Fimi

Lake Leopold II, whose surface is, roughly, as large as Westmorland, lies at one of the lowest parts of the plain. Round about it are extensive marshes, and to its margin extends the waterlogged forest. A few sluggish rivers and streams drain the spongy areas to the north and west, and amongst these feeders the Lutoi ('river on the left') is the most important. Two hundred miles to the east the plain rises by its first step, and from this higher ground rivers flow north and west. The Lokoro flowing west into Lake Leopold II meanders through a particularly huge swamp. At the south end of the lake the Lukenie, rising in the heart of the higher country just mentioned, enters after a course of over 400 miles, and then leaves again, now as the Fimi, to enter the Kasai. The lake acts as a reservoir to the Kasai and the Congo. Sometimes it receives the surplus through the Fimi and sometimes discharges by it.

The Southern Highlands

The Benguela Ridge

Of the highlands which encircle the Congo plain the most extensive and varied are those to the south. A number of the tributaries of the Kasai river rise on the Lunda plateau, which is an extension of the great southern tableland mentioned early in the chapter. The Benguela ridge, open or bush-covered grassland, from 2,500 to 2,900 feet in altitude, crowns the main plateau which descends gently northeastwards to the Congo plain. On the west it rises some 1,000 feet above the Crystal mountains. The relief is generally regular and undulating, though parts of the country are covered with rounded hillocks or bosses of resistant rock. Farther north and at lower levels the rivers are entrenched in deep, thickly wooded, valleys and are interrupted by falls and rapids. Tributaries to the main rivers eat back into the blocks which separate them one from another, and the break between these much eroded lower slopes and the gentler rise at higher levels follows a sinuous and irregular line.



5. *Congo plain. Dense tropical forest. The horizontal line (like a scratch) is all that can be seen of a road. The white diagonal marks show the course of a stream*



6. *Stanley Falls. Native fish traps in foreground*



7. *The Zilo Falls on the Upper Lualaba*



8. *The Gorge above Zilo Falls*

At the base of the lower slopes and roughly parallel to the Benguela ridge flow the Sankuru and Kasai rivers, running from east to west. Their headwaters rise in the south on the Congo–Zambezi watershed. The Sankuru is navigable from the Wolf rapids, 77 miles above Lusambo, to Stanley Pool. Its upper course is known as the Lubilash. Before the plain is reached the Sankuru receives the Bushimaie—a deep-cut river much beset with rapids—from the west. The Sankuru and upper Kasai join 260 miles down stream from Lusambo at Basongo, where the river is 3 miles broad with forest-clad shores. The undulating grass-covered downs on either side show that the highlands are receding and the Congo plain has been reached.

The upper Kasai, flowing north parallel to its own tributaries (the most noteworthy of which is the Lulua, on the east) and to the Sankuru, marks the boundary between Angola and the Belgian Congo as far north as Nimba rapids (280 miles above Basongo). Much of the country between the Kasai and Sankuru is boulder covered. After passing a series of rapids, which extend at irregular intervals for some 140 miles, the Kasai is joined by its western tributaries. Charlesville at the foot of the Wissmann rapids, 100 miles above Port Francqui, marks the limit of navigation of this river from Stanley Pool. A short narrow-gauge railway by-passes the Wissmann rapids. Below Charlesville the Lulua enters from the east; it is navigable seasonally for some 35 miles up to about Luebo, a post on a river of that name. High up between the Kasai and Luebo rivers bold rocky mountains, some of them of jagged limestone, rise for about 1,000 feet above the surrounding plain. On the north bank of the Kasai, a dozen miles east of Basongo, stands Port Francqui, the terminus of the Bas-Congo–Katanga railway which links Belgian Congo with the South African railway system, and also with the Lobito bay railway via Tenke junction.

Many other streams and rivers rise on the highlands to the west of the Kasai and all but a few become its tributaries. They have the deep valleys and rapids normal to the highlands. The most important tributaries of the lower Kasai are the Loange (or 'Red Water River', which curiously enough is not interrupted by rapids for much of its course) and the Kwango. The Kwango and its tributaries, Kwilu, Kwenge, Inzia, and Wamba provide 495 miles of navigable waterway. The Kwilu is navigable to Kikwit, at the foot of Archduchesse Stephanie rapids about 20 miles above the confluence of the Kwenge, where also stands Leverville. Throughout much of its upper course the Kwango flows through dense forest country, and also marks

a portion of the boundary between Angola and Belgian Congo. Although its upper reaches were known in the sixteenth century, European curiosity of the time led no farther, or the discovery of the Congo might have been antedated by three hundred years.

The Congo–Zambezi Watershed

It should be noted that the boundary of the Belgian Congo, from the upper waters of the Kasai eastwards, follows the Congo–Zambezi watershed. The height of this watershed, sometimes open, sometimes covered with scrub, is generally from 3,500 to 4,500 feet above sea-level. Along it is one of the oldest highways of Africa, leading from the heart of the continent to the Atlantic at Benguela.

For four hundred miles, from the point where the boundaries of Angola, Northern Rhodesia, and the Belgian Congo meet, the fall to the Congo is more abrupt than that to the Zambezi. The latter rises within 3 miles of the Lumpepa at 24° 20′ E. and 11° 20′ S. The Lumpepa is an affluent of the Congo, and the two streams flow north on parallel lines for 10 miles or more until the Zambezi turns away west and then south-west. The watershed is, indeed, ill defined and, throughout its length, streams, ultimately to flow north or south, 'hug the divide'. Because the trace of the Congo–Zambezi watershed can be followed with ease on a map it does not follow that the relief of this portion of the Belgian Congo is simple. A great spur of mountain country, which includes the Samba mountains, rises to roughly 4,000 feet, and extends north from the Zambezi–Congo watershed, separating the basin of the Lualaba from that of the Lulua and Sankuru. This strongly marked feature divides into two main spurs at about 9° S. lat. and contains the sources of the Lomami. Lakes, streams, and scattered woods make the Samba mountains a region of remarkable natural beauty. The spurs of the mountains, as they advance northwards on either side of the Lomami, crumble into hills and then soften into rolling forest-covered downs.

Katanga (Plates 7, 8 and 9)

Katanga is that region of the Belgian Congo richest in minerals, healthiest in climate, and easiest to develop, although first approaches to it came more easily from the south than across the forest. It is far the best mapped portion of the colony. Katanga is bounded on the north by the Luvua river and on the south by the watershed boundary between the Belgian Congo and Northern Rhodesia. It is usually divided into two zones, the southern and the northern.

The southern zone is an extension of the tableland of Rhodesia. It lies between 3,000 and 4,000 feet above sea-level and is largely open grass country, though studded with woods and interspersed by many of those 'dembos', or grass-covered and often marshy hollows, through which streams filter to the larger rivers. At its western end the Congo–Zambezi watershed itself is ill defined and bush covered, but emerges more clearly, and higher, as it turns south-eastwards to Sakania, and eventually to the south-east corner of the colony. Upumpu peak, near the corner, is 6,000 feet high. Surrounding hills average 5,000 feet, and here the whole country, hill and valley, is covered with a mantle of open forest and bush. Fifty miles north of the watershed an east-to-west section would show innumerable small valleys as minor tributaries find their way to the three great rivers—the Lualaba, the Lufira, and the Luapula. The southern zone may be said to extend 120 miles north of the watershed. In climate it is sub-tropical, its rains are seasonal only, and its nights are cool. Unfortunately much of the surface soil is laterite and infertile.

The northern zone shows a sharp difference in structure and relief. The folded, well-sculptured, uplands of the south give place to extensions of the Rift valley system. Deep depressions divide blocks of flat-topped mountains. These mountain blocks are extensive, bordered by scarps, or very steep slopes, and about 5,000 feet high. There are gallery forests on the rivers, open woodlands at the sources of streams, but higher ground is generally covered with grass, or with orchard bush. The various blocks—Mitumba, Kibara, Kundelungu, and others—were parts of a continuous plateau, but are now divided by steamy valleys, sometimes classified as secondary rifts, through which the rivers flow, and in which hot springs, marshes, and marshy lakes appear. Lake Mweru and the Upemba depression are such foundered valleys.

The rivers of Katanga soon became important. In the west the Lualaba rises near the watershed boundary in latitude 12° S. and longitude 26° E. Crossing the Tenke–Lobito bay railway near Musonoi station, it loses height quickly at the Zilo falls, which lead down through a steep gorge 20 miles north of the railway. A succession of rapids lead into the Upemba depression, which lies between the Kibara mountains in the east and the Hakansson mountains on the west. Passing through Lake Upemba, the Lualaba reaches Lake Kisale, where it is joined by the Lufira. The Lufira rises 160 miles farther east than the Lualaba, but also on the watershed. Flowing

between the Mitumba and Kibara blocks, it drops over falls and enters the Upemba depression to join the Lualaba, which, thereafter, flows into the central plain.

The Luapula rises in, and flows southwards from, Lake Bangweulu in Northern Rhodesia. Turning westwards, curving sharply, and then flowing north to Lake Mweru, it forms the boundary between Northern Rhodesia and the Belgian Congo for nearly 400 miles, in the course of which it passes over several falls. Emerging from Lake Mweru as the Luvua, it falls from the perimeter highlands to the plain and joins the Lualaba at Ankoro.

The Eastern Highlands

The Rift Valleys (Plates 10, 11 and 12)

The eastern boundary of the Congo basin has been formed by those forces which caused the great system of fractures of the earth's crust known as 'Rift Valleys', one section of which is now occupied by lakes Tanganyika, Kivu, Edward, and Albert. These four lakes are bordered by high mountain blocks which descend very abruptly lakewards and slope more gradually eastward and westward towards the east African plateau and the Congo basin respectively. The eastern highlands, which are on the west of the Rift valley, or trough, go by various names. It is remarkable that the Lukuga river makes the only breach in them. This river now flows from Lake Tanganyika, near the port of Albertville, to join the Lualaba near Kabalo. It does not appear to have acted as an overflow to the lake as recently as the time of its discovery by Livingstone. It seems clear therefore that very recent, if slight, movements or adjustments of the lake itself, or of the valley of the Lukuga, have brought about the present situation. There is a legend of abnormally high waters on Lake Tanganyika during the years 1865–1867. They subsided about 1877–1878, so suddenly that much of an unfamiliar shore of the lake was exposed to view. The level lost has never been entirely regained. The Lukuga may have begun to take the overflow again after this time, or its mouth may have been silted up, only to be flushed out by an abnormally high water in the lake. The Lukuga is not navigable and alongside of it runs a railway from Albertville, on the lake, to Kabalo on the Lualaba. The region through which it flows consists of wide plateaux and undulating hill country. The lake itself takes in streams from as far east as the longitude of Tabora, in Tanganyika Territory, and thus places a large portion of that country, by way



9. *Kundelungu plateau and valley of Lufira*



10. *Ruzizi river between Lakes Kivu and Tanganyika*



11. *Active volcano of Nyamlagira, north of Lake Kivu*



12. *Lava flow, Nyamlagira, north of Lake Kivu*

of Lake Tanganyika and the Lukuga, into the true, as distinct from the political, Congo basin.

Lake Tanganyika is the second deepest in the world, and is only surpassed by Lake Baikal in Siberia. Its surface is 2,550 feet above sea-level, while its floor is 2,200 feet below sea-level. Perhaps it is deeper still, for there appear to be two chasms separated by a ridge. The part of the Rift valley in which it lies is comparatively narrow, 40 to 50 miles wide. The lake occupies 400 miles—the distance from London to Edinburgh—of the length of the valley.

North of Lake Tanganyika the Rift continues to keep the same general breadth as at the lake, until it is partially filled by Lake Kivu, whose surface-level is 2,200 feet higher than Tanganyika. The two lakes are joined by the Ruzizi river. Except for a short deep gorge through a high rock barrier at the southern end of Lake Kivu, the course of the Ruzizi is over a low marshy plain as far as Tanganyika (Plate 10).

It is held that at some distant period lakes Kivu and Edward (the next lake northwards in the Rift) were one lake and were connected with the Nile basin. They have been separated by the crustal movements and subsequent volcanic activity which created the Mfumbiro, or Virunga, range of active volcanoes, as well as by a laval flow which plugged the depths of the trough. The Mfumbiro range includes eight lofty craters, one of which, Karisimbi, is 15,000 feet above sea-level. This range is one of the limits of the Congo basin, for Lake Edward still feeds the Nile (Plates 11 and 12).

Overlooking Kivu to east and west are mountains which exceed 8,000 feet above sea-level. From Lake Edward north to Lake Albert, the mountains of the western border of the Rift mark the boundary of the Congo basin. These mountains are overshadowed by the peaks of Ruwenzori, which rise 16,800 feet above mean sea-level. Ruwenzori is the highest non-volcanic mountain in Africa and stands as an isolated block within the Rift valley, but near its eastern side. The rivers and streams which rise on the mountain flow into the Nile. The Semliki river connects Lake Edward with Lake Albert, and the trough in this region is known as the Semliki valley.

Eastern Highlands

The western slopes of the eastern highlands gradually lose height towards the Lualaba. The slopes are deeply cut and eroded by tributaries of the Congo and Lualaba. The Ituri (Aruwimi) rises within a few miles of the Semliki, which, it was noted above, flows towards

the Nile. The Lindi, which joins the Congo just below Stanleyville, rises near Lake Edward. The Lowa, which flows into the Lualaba between Ponthierville and Kindu, rises near Kivu. The Ulindi, another Lualaba tributary, rises between Kivu and Tanganyika. As already noted, the Lukuga flows from Tanganyika to the Lualaba. The upper courses of these rivers are generally in savanna country, the lower courses in gallery forest, and, as one has learned to expect in Belgian Congo, much broken by rapids. The western mountains about Lake Tanganyika are often table-topped, and contain some high ridges dotted with minor peaks.

Ruanda-Urundi

Before leaving this part of the world it will be well to speak of the Mandated Territory of Ruanda-Urundi which, although outside the Congo basin, is politically joined to the Belgian Congo. The territory is a large mountainous plateau, the west side of which slopes steeply to lakes Kivu and Tanganyika. The highland is rugged and hilly, the general slope is slight and to the east. The maximum elevation is over 8,000 feet, but 3,000 feet is more common.

The territory generally is one of the happiest in central Africa. The soil is volcanic and comparatively rich. The climate is relatively healthy and used to be free from the ravages of the tsetse-fly, although neighbouring districts have been invaded recently by this scourge. This is, indeed, an area of mixed farming.

Low dissected escarpments border the broad Kagera valley to the east. The valley is occupied by swamps and small lakes. The Kagera drains into Lake Victoria and is the beginning of the White Nile. Several lakes, surrounded by high rocky hills (5,000–6,000 ft.), drain into the upper Kagera and adjacent streams.

The Nile–Congo Watershed

The Nile–Congo watershed is an undulating plateau with an altitude varying from 4,200 feet in the east, near Arua, to about 2,000 feet in the west. Near the frontier with Uganda topography is more irregular than it is farther west, south of the river Bomu, which forms the boundary with French Equatorial Africa. Small mountains rise from the high plateau, and the country is broken as the edge of the Rift valley is approached. The hills of the Nile–Congo and Uele–Ituri watersheds rise 300 to 700 feet above the plateau and are bush covered. On the Nile–Congo watershed small hills define the divide as far west as the point where the road from Faradje to Juba crosses

the boundary, but from there to the source of the Bomu river the watershed is a narrow strip of nearly flat bush-covered upland, sometimes as much as 2 miles in width, but generally much less, and from 2,000–3,000 feet above sea-level. The streams which rise on this flat upland might easily flow in either direction, for it is as undefined a watershed as that between the Zambezi and the Congo. Those which fall to the Congo basin enter the Ubangi by way of the Dungu, Uele, and Bomu rivers which flow from east to west. There is, however, a marked difference between these rivers and those of the southern highlands and of Katanga. The valleys of the Uele and its tributaries are generally broad and shallow rather than narrow and deep and the fall is slight. Gallery forests clothe the banks of most of the rivers.

The Uele is the northern limit of the tropical forest, which finds its greatest luxuriance in the valley of the Ituri. This is the home, *par excellence*, of the pygmy, the okapi, and the gorilla, and is in sharp contrast to the fairly open uplands of the Uganda frontier.

The Ubangi River

From the point where the headwaters of the Bomu emerge from the Congo–Nile watershed the basin of the Congo is no longer within the boundary of the Belgian Congo. The boundary of the colony follows the Bomu river to its confluence with the upper Ubangi and down the upper and lower Ubangi to its confluence with Congo. Tributaries of these rivers are received on the northern and western banks. These tributaries obviously belong to the Congo basin, but they flow through French Equatorial Africa, and are outside the scope of this chapter. The circuit of the Congo basin in as far as it concerns Belgian Congo is therefore complete. Rapids occur both on the Bomu and on the Uele shortly before they combine to form the upper Ubangi. More rapids appear on the Ubangi above Zongo; thus there are two steps along the path of the river in its descent from the plateau of the Bomu–Uele to the Congo plain. Between the Ubangi and the Congo, near their junction, is a great region of marsh and water-logged forest.

GEOLOGY

General Outline (Fig. 12)

The Belgian Congo is essentially the basin of the Congo river and its numerous tributaries: the basin owes its size, shape, and general configuration to geological structure rather than to the nature of the

rocks that form the surface. This somewhat unusual statement finds its explanation in the fact that the region has been dry land for a vast period of time, during which successive and extensive phases of denudation have given rise to monotonous plateaux, thrown into broad undulation and sharply fractured. The major undulations are the uplifted coastal regions from the French Cameroons through Gabon to north-western Angola, the tectonic basin of the Middle Congo and Kasai, and the uplands that extend from the frontier of the Belgian Congo with the Anglo-Egyptian Sudan to Angola and Northern Rhodesia. In this third zone, as in the adjoining territories of Uganda, Tanganyika, and Northern Rhodesia, the generally monotonous relief is broken by the striking scarps of the Rift valleys—narrow lowland strips, many of them occupied by lakes, bounded or defined by fractures. The nature of the fractures is still a matter of controversy. For many years they were thought to indicate faulting induced by tension, but more recently a strong case has been made for regarding them as compressional features, low-lying blocks having been forced down between others which ultimately rose above them on either side. In this system must be included the great Ruwenzori massif, a segment of the general plateau which has been forced upward, suffering thereby intense denudation in which glaciers still play a prominent part.

The fractures, whatever their nature, have, in the course of time, cut off the original headwaters of the eastern Congo tributaries which rose in the Uganda–Tanganyika highlands (for example the Kafu and Kagera); tilting has caused these rivers to flow eastward, flooding their upper courses, instead of westward. The region of fractures is also one of great volcanic activity, which is not yet entirely extinct.

In the south the tributaries of the Lualaba, Lubilash, and other rivers drain the plateaux northward, and ultimately to the Atlantic: the adjacent parts of the same plateaux in Northern Rhodesia and eastern Angola are drained by the headwater tributaries of the Zambezi, eastward to the Indian Ocean. The Congo–Zambezi watershed is but slightly marked and seems to be attributable to the accident of river development rather than to any geological cause.

Although the Congo basin is a vast and well-marked entity, outstanding on any physical map of Africa, it must not be regarded as an enclave but as an essential part of the African continental platform: its geological constitution is essentially similar to that of much of East Africa, of the northern territories of South Africa, and of Angola, and it cannot be considered apart or divorced from those

regions. In this matter the 1,500-foot or 500-metre contour, which so plainly marks the Congo lowland, gives an exaggerated impression: the surfaces rise almost imperceptibly, over thousands of square miles, to between 3,000 and 5,000 feet.

Four groups of rock between them occupy nearly the whole area of the Belgian Congo. The first, and oldest, is the 'Basement Complex' of highly metamorphosed folded rock intruded by granites, pegmatites, and basic igneous rocks, varied and involved Archaean rocks which constitute everywhere in Africa the platform on which lie younger rock groups. The complex forms the broad rim of the Congo basin, from the Ubangi-Shari watershed in the north, through the eastern uplands, to the southern end of Lake Tanganyika: it is also prominent in the south-east (upper Kasai and Lubilash basins) and in the coastal sector. Its relief is subdued through profound denudation except where it has been freshened by differential movement or by fairly recent erosion. Upstanding relics of intrusive rocks and of old denuded surfaces also stand out as isolated 'islands' and ridges (inselberge).

The second rock-group consists of rocks less metamorphosed than the older series, upon which it rests unconformably: it includes a comprehensive series of sediments, and its origin therefore is not in doubt. It is presumed to be of Pre-Cambrian age, and it is most extensively exposed in the south-east, with patches also in the north and in the coastal districts.

The third group lies unconformably on the second, and it outcrops in the same general regions: it is essentially sedimentary and is not generally metamorphosed. Its age has been the subject of long-sustained discussion: by some it is regarded as Pre-Cambrian, by others as Palaeozoic. No undisputed fossils have been found in it. It is separated by a marked unconformity from the beds which overlie it.

The fourth group, the Lualaba–Lubilash, is two-fold: the Lualaba is considered to be of late Palaeozoic age, the Lubilash to be Triassic. It will be appreciated that these continental beds recall the stratigraphical position of the Karroo formation of South Africa, Angola, the Rhodesias, Nyasaland, and much of East Africa: close and well-documented comparison may be made between them. The Lualaba beds lie along the river of that name and may be traced across the Congo to the Ubangi north of Bangui. They also occur in the river valleys of the south-east, where they are exposed beneath the Lubilash sandstones. The Lubilash beds form the floor of the central parts of

the Congo basin, being extensively exposed in the drainage system of the Kasai: farther north they are covered by the alluvial deposits and swamps of the Congo river, and they reappear on the northern side of the basin, between the Congo and the Ubangi. In the main, they owe their preservation to the formation of the basin, just as many of the outcrops of the Karroos are preserved in depressions and in-faulted belts. No younger beds (other than alluvium and superficial accumulation) are seen in the Congo basin: on the Atlantic coast are Cretaceous and Eocene beds, marine and estuarine. It will be noted that the sea did not invade the Congo in Mesozoic or Tertiary times, whereas it twice penetrated into the Niger, Benue, and Chad basins.

Geological History

Much confusion has arisen in the geological investigation of the Belgian Congo owing to the rarity of natural exposures of solid rock and to the absence of fossils by which correlation might be effected. Moreover, the use of types of rock (i.e. lithology) as a means of comparison has led to wrong conclusions and false assumptions. Much of the literature is consequently contradictory, and it is only in fairly recent years that the broad outlines of the region as a whole have emerged, though even now the ages of important rock-groups are still in dispute. In certain circumscribed areas, for example the Katanga, detailed investigation has established precise knowledge, but many of the outstanding geological facts of such an area are found to be inapplicable elsewhere (for example in not far distant parts of Northern Rhodesia). The following account aims, therefore, at giving as broad and as uncontroversial a record as circumstances allow, and at making comparisons where possible with the universally known terms used in the geology of south-central, East and South Africa. It will be realized that comparisons with the geology of Africa north of the Ubangi watershed are impracticable.

The difficulties outlined above apply also to the widespread and varied igneous rocks of many ages.

Archaean, Pre-Cambrian

The 'Basement Complex', already briefly described above, need not be further defined. Unconformably upon it, lies a great group of less highly metamorphosed sediments, with intrusions. These are identified under different names from place to place, for example Urundi, Kibara (in part), Muva or Muva-Ankole in the south and

south-east (and adjoining British territories), Haut-Oubangui system in the north. Correlation is still a matter of some uncertainty: it is at least clear that the rocks were of sedimentary, evidently marine, origin and that there were one or more submarine troughs, one probably across the region of the lower Congo, another in the south-east (including Katanga). There was folding, locally acute, at the end of this period of sedimentation.

Pre-Cambrian and/or Lower Palaeozoic

A great thickness of sediments is exposed, especially in the copper-mining regions of Katanga and Northern Rhodesia, and in these districts it has been studied in much detail. There are other outcrops of at least a part of the group in the northern Congo and in the coastal mountains. There is much that is still in doubt, and the following account is based on the exposures of the south-east. The group has become known as the Katanga System in recent years and consists of two parts, an older or Mines Series and a younger or Kundelungu Series: the latter in turn is divisible into lower and upper sections. The Mines Series and Lower Kundelungu are marine, and represent a Katanga overlap, starting in Mines Series times, northward over the Congo, the sediment containing notable calcareous beds, which, however, do not seem to be constant. The Mines Series include conglomerates, sandstones and shales, limestones and dolomites (with which the metal deposits are associated); sandstones, siliceous rocks, and more or less graphitic black shales. The Lower Kundelungu contains glauconitic (marine) sandstones, thought to have been formed in a subsiding depression; they are transgressive and thin out to the north and north-east. Apart from the economic importance of the metalliferous beds, interest is centred on the conglomerates, of which there are several. The most striking is that which occurs at the base of the Lower Kundelungu, since it has been shown to be of glacial origin. It is an indisputable fact that glacial conditions were strongly developed in the region, and 'tillites', or hardened boulder clays, may be traced in a number of places in the series correlated with the Katanga System, and with the Lower Kundelungu, from the Congo to South Africa. It is beyond the scope of the present account to consider how glaciation came about, but it may be accepted that such was the case, especially in Pre-Cambrian times, in widely scattered places in many parts of the world. Locally, glaciers may have come from deeply eroded mountain ridges formed by post-Muva-Ankole movements. The glaciers came from the south and

the tillites fail northward, but the occurrence of tillites south of the equator indicates a more general explanation than the presence of mountain glaciers.

Some of the conglomerates of the Katanga System indicate periods of earth movement, and consequent denudation. Considerable movement evidently took place, and the folds of the Lower Kundelungu series are older than the conglomerates of the Upper Kundelungu. The rocks of the Katanga System below the Upper Kundelungu are metamorphosed in varying degree, but those of the Upper Kundelungu, transgressive on the Lower and in large measure of continental origin, may be quite unchanged. It has been shown that the folding of the Katanga System in the Katanga–Northern Rhodesia region is severe, with overfolding from the south. The overfolds and overthrusts, with north-east and north-west strikes, are roughly at right angles to those produced by the Muva-Ankole movements. There are also post-Katanga or post-Mines Series granitic intrusions.

Considerable difference of opinion remains as to the age of the Katanga System. At a meeting of the geologists concerned, held at Kigoma in 1932 under the auspices of the International Geological Congress, the Mines Series was correlated with the Transvaal System, and the Kundelungu Series with the Waterberg System of South Africa. The Waterberg and Transvaal Systems are regarded as pre-Devonian, and the Transvaal System as Pre-Cambrian rather than Cambrian or Lower Palaeozoic. Some authors refer the Mines Series to the Lower Palaeozoic, others place the whole of the Katanga System in the Pre-Cambrian. Certainly it seems likely, but by no means certain, that the Lower Kundelungu tillites (and therefore all beds below them) might be older than the Cambrian, since Pre-Cambrian tillites are well known in many parts of the world, but this reasoning is far from conclusive. On the whole, the views of the geologists who met at Kigoma, well qualified to judge from their long experience of the beds, may be taken to provide the best working hypothesis.

The sequence of events in the western Congo was much the same as that in Katanga; a period of subsidence interrupted by glaciation from the south-west, the tillite thinning to the north-east. The beds above the tillite are defined as the *Schisto-calcaire* (referred to the Lower Kundelungu) and *Schisto-gréseux* (Upper Kundelungu). The beds occupy a syncline along the Congo valley, the western flank is strongly folded, and they are divided lithologically, appearing to be conformable. The succession seems to be incomplete or only partly

exposed, and much confusion has arisen owing to a resemblance to the succession of beds met in the Lualaba–Lubilash (Karroo). The *schisto-calcaire* and *schisto-gréseux* are folded; south of the lower Congo the folds run east and west, pushed from the south. It will be observed that the *schisto-calcaire* and *schisto-gréseux* are reported to be conformable and to be folded, whereas the Lower and Upper Kundelungu are mutually unconformable, and the latter postdates the strong folding of the Lower Kundelungu.

In the Ubangi region sub-horizontal, slightly metamorphosed, sediments (the Fouroumbala System) are referred to the Katanga System. They are apparently conformable on the Haut-Oubangui System.

Lualaba–Lubilash

These continental beds of the Congo basin are an extension of the Karroo deposits of East and South Africa, and of Angola. They represent late Palaeozoic to Triassic, and, near the Atlantic coast, Jurassic stages (which alone are marine). Within the Congo basin the Karroo beds have been divided into the Lualaba–Lukuga stage (Lower Karroo; Dwyka–Ecca) and the Lubilash–Sankuru stage (Upper Karroo; Stormberg). The broad terminology of Lualaba and Lubilash, in general use in the Belgian Congo, describes, in fact, the two groups, both usually unfossiliferous, continental, little deformed, lying in basins and hollows, differentially warped with denuded (peneplaned) surfaces, and with faults and fractures inherited from below and transmitted to the later rifts. The two have sometimes been regarded as a single unit. The older beds appear on the sides of the basin from beneath the younger deposits of the centre. For the greater part they are lagoon and lake beds with highly coloured cross-bedded sandstones, but they include glacial beds, valuable coals in the lower part, and semi-arid deposits above them. The Lower Karroo, strongly developed in East Africa, occurs in the coalfields of the Belgian Congo (Lualaba). At the base is a glacial conglomerate (Dwyka), part of great glacial boulder beds and clays known in widely scattered regions of East and South Africa, referred to the Upper Carboniferous and distinct from (although often confused with) the Kundelungu tillites. Above the glacial beds are coals (Lukuga and Luena) with plant remains known as the *Glossopteris* flora, which is well known in beds of Permo-Carboniferous age in the southern hemisphere.

The Upper Karroo deposits cover wide areas. Their lower part is

sandy in the west, but is replaced toward the centre by clays and local bituminous beds; the upper part is a constant sandstone (Lubilash).

It has been shown in recent years that the lower beds of the Lubilash (Triassic) have affinities with the Middle and Upper Beaufort beds of the Karroo succession and that they are bounded by unconformities above and below; these are called the Stanleyville beds and they are variable. A middle term is thus introduced in the succession which is set out as follows:

(3) Upper Karroo (Stormberg): Lubilash–Sankuru.
(2) Middle Karroo (Beaufort in part): Stanleyville beds.
(1) Lower Karroo (Ecca, with Dwyka at base locally): Lualaba–Lukuga.

It should be noted that the extensive preservation of the beds of Karroo age in the Belgian Congo is due to structural movements, and in particular to the formation of a depressed area. The preservation of the Lualaba–Lukuga depended upon in-folding and in-faulting during the period of the Stanleyville movements: the rest was swept away by denudation. The Lubilash beds represent the accumulations by stream and wind in semi-arid conditions on a rolling land surface cut by river valleys and running from the north-west and north, thus opposite to the direction of the present streams. The ancient channels are filled with unsorted stream gravels, which are diamond bearing. It will be obvious from the above brief account that views on the beds of Karroo age in the Belgian Congo have undergone many changes in the course of time and that a new and comprehensive view of them is gaining ground. This may be found in the authoritative monograph, *The Evolution of the Congo Basin*, by A. C. Veatch (Memoir 3, Geological Society of America, 1935).

Post-Lubilash vertical movements created a broad basin in the Belgian Congo. In the lower and middle Congo there was pitching towards the east, elevation of the land on the north-west and south-east of the Congo river, giving rise to a wide syncline of the lower Congo with its axis inclined to the east.

Post-Triassic Land Surface

The history of the Belgian Congo since the end of the Karroo depositional phase has been a continuous succession of subaerial denudation, slight deposition, and vertical movement. Only on the Atlantic slopes are marine Jurassic, Cretaceous, and Eocene deposits to be found. Of these none calls for further mention here.

The monotonous succession of planation and movement, producing the contrasts of featureless plateaux and sharp relief that is to be seen to-day, can be briefly summarized as follows:

Jurassic and Cretaceous time was occupied by extensive denudation, reducing the Belgian Congo and all adjacent territories to virtual flatness (peneplain). There was a period of broad upwarping followed by long intervals of peneplanation during the mid-Cretaceous. The Rift valleys and up-raised massifs and plateaux in the eastern highlands and Katanga were largely formed in late Mesozoic times, accompanied by down-warping of adjacent lands. Recurrent movement along old faults, accompanied by volcanic activity, has occurred intermittently throughout Tertiary times to the present day.

Prolonged planation through the older Tertiary produced the mid-Tertiary or Miocene peneplain, which now forms much of the present higher plateau-surfaces. Aridity then became marked, but was interrupted for a time by rainfall sufficient to form limestone-producing freshwater lakes and perhaps sluggish rivers on its flat and, in general, sand- or gravel-covered surface. Aridity then became most marked, resulting in widespread silicification of the surface deposits previously formed, which are Oligocene. The silicification also affected older rocks that happened to be exposed, and in places extended through some 300 feet of superficial deposits. The fossils of the freshwater deposits mentioned above are therefore silicified, sands are altered to chalcedonic quartzite, and high-level gravels are also affected.

Further planation produced the mid-Tertiary or Miocene peneplain, to the uplift and down-warping of which the present Congo basin owes its origin. West of a line through lakes Tanganyika, Kivu, Edward, and Albert, especially west of a north–south line along the Lomami, all the major streams of the Congo basin are in positions determined by this warping. The Rift valleys and lakes mentioned above were produced by post-Miocene fault movements.

The mid-Tertiary peneplain, especially in the broad regions south of about latitudes 8° 15′ S. extending into Northern Rhodesia and Angola, is exceedingly monotonous. It is irregularly covered by Plateau Sands and dominates the landscape, but has been dissected by a further stage of planation which produced the end-Tertiary peneplain. The end-Tertiary peneplain is covered by patches and concentrations of pebbles, called Plateau Gravels, which in turn are covered by Plateau Sands. The latter were formed under arid, probably in part desert conditions, and attain a thickness of 150 feet.

The peneplain, with its mantle of gravel and sand, is well developed north of the Congo–Angola frontier, but is here essentially limited to the region of the soft Lubilash beds.

Laterite

The word 'laterite' (Lat. *later*, a brick or tile) was first used in 1807, in the description of certain red or reddish-yellow soils in southern India. Yet in no continent is laterite so widespread as in tropical Africa, where it forms the commonest product of weathering of all rocks other than siliceous sandstones and quartzites. A note on this weathering is therefore appropriate. Under normal conditions of rock disintegration in a humid temperate climate, rock-forming minerals break down to give the hydrated aluminium silicates which form the constituents of common clays. Under tropical conditions, on the other hand, especially where there is a marked alternation of wet and dry seasons, rocks are leached of not only all their lime and magnesia but also of almost all their silica, so that only the hydroxides of iron and aluminium are left. This residue constitutes laterite. Laterite therefore consists essentially of ferric hydroxides, with hydroxides of aluminium and a little manganese, titania, and some residual silica. Where the underlying rock is highly aluminous, aluminium hydroxides predominate in the product of weathering and a special light-coloured variety of laterite known as bauxite is formed.

True laterites are widespread throughout the whole of the Congo basin, in one district or another of which their formation has been proceeding since Tertiary times. Many of the older or 'fossil' deposits form hard, impenetrable, surface incrustations, often capping terraces or plateaux, as between the Kassai and the Lualaba; but over a great part of the country the deposit is still forming, especially in districts of low relief. Lateritization is as characteristic of the broad grassy plains of the south as it is of the equatorial forests, but in hilly country the development is at a minimum. The more recent deposits in general form a great, homogeneous blanket giving few clues to the nature of the underlying rocks; exceptionally this blanket may range from 60 to over 100 feet in thickness, as can be observed in natural cliff exposures near Lake Leopold II and Lake Tumba.

Laterite is infertile, and where it appears as a hard crust it gives rise to almost desert conditions. This lack of fertility is partly due to the combination of the phosphates, originally present in the parent rock, with the iron and aluminium hydrous oxides, thus assuming

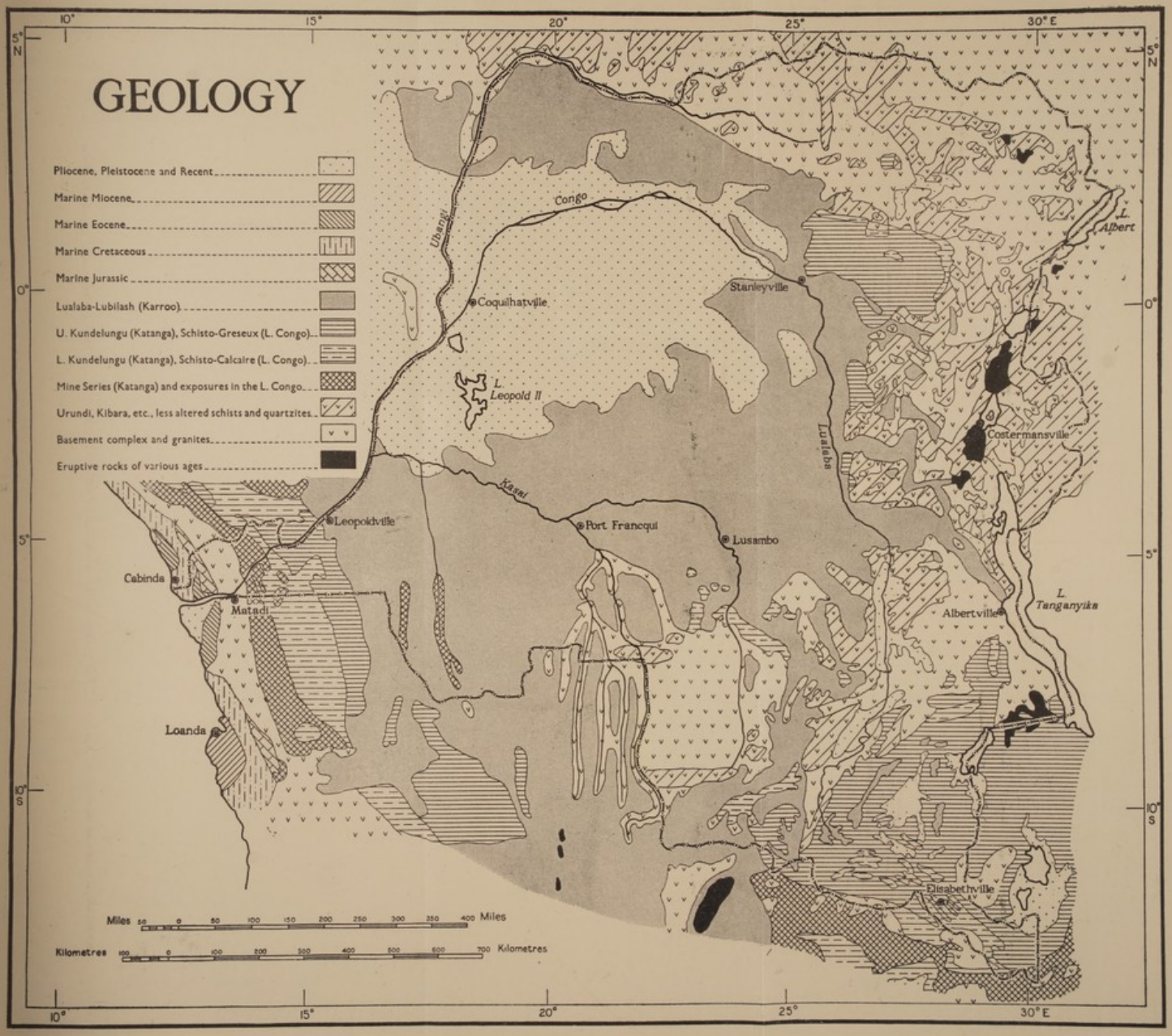
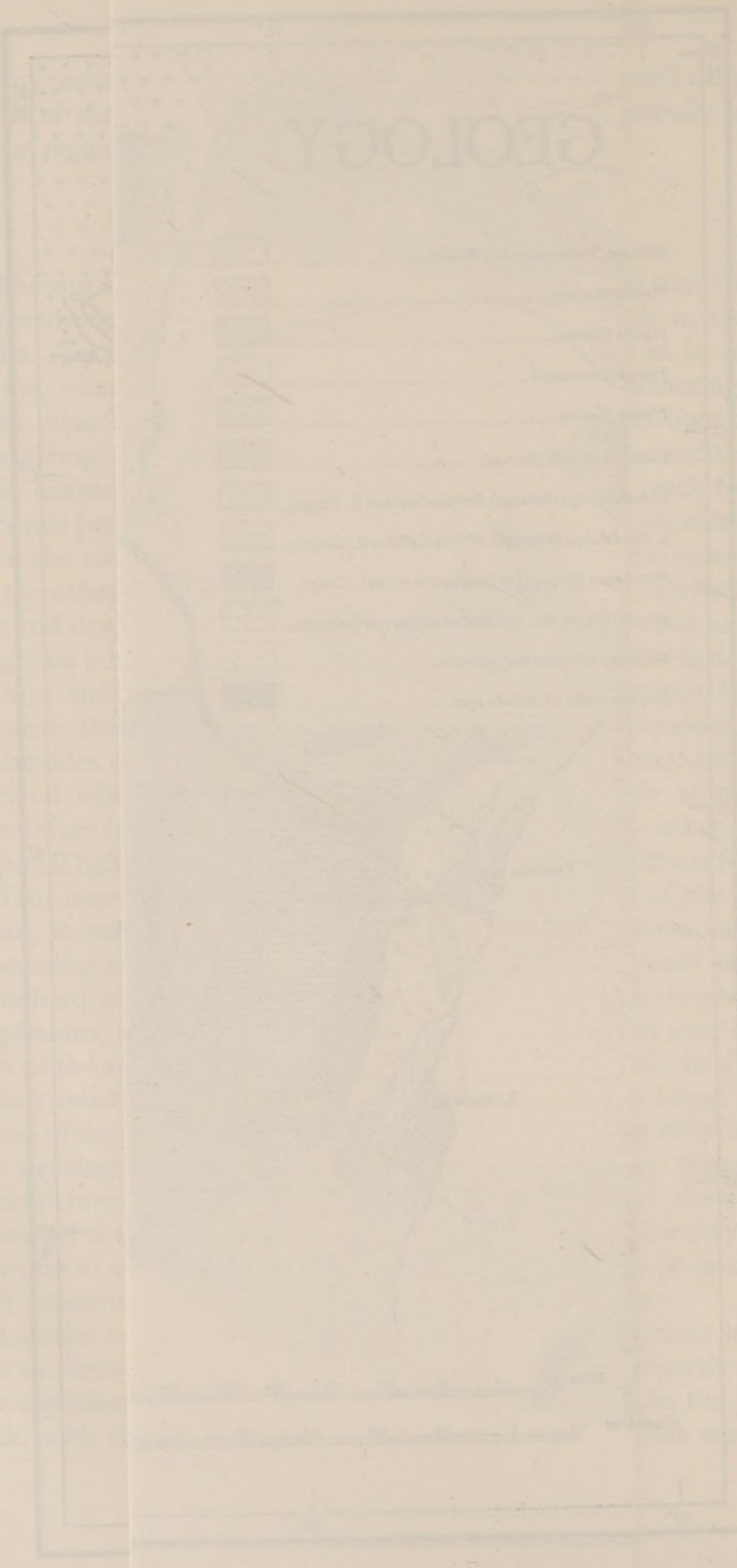

GEOLOGY
Pliocene, Pleistocene and Recent
Marine Miocene
Marine Eocene
Marine Cretaceous
Marine Jurassic
Lualaba-Lubilash (Karroo)
U. Kundelungu (Katanga), Schisto-Greseux (L. Congo)
L. Kundelungu (Katanga), Schisto-Calcaire (L. Congo)
Mine Series (Katanga) and exposures in the L. Congo
Urundi, Kibara, etc., less altered schists and quartzites
Basement complex and granites
Eruptive rocks of various ages
10°
15°
20°
25°
30° E
5° N
0°
5° S
10° S
Congo
Ubangi
Kasai
Lualaba
L. Albert
L. Tanganyika
L. Leopold II
Coquilhatville
Stanleyville
Costermansville
Leopoldville
Port Francqui
Lusambo
Albertville
Elisabethville
Cabinda
Matadi
Loanda
Miles 50 0 50 100 150 200 250 300 350 400 Miles
Kilometres 100 0 100 200 300 400 500 600 700 Kilometres

FIG. 12



a form unassimilable for plant life. In the region of the tropical forests, however, the laterite is loose, uncompacted, and in general forms a soil which is easy to work, although there are exceptional areas. The harder varieties have been used as a building stone, and the lateritic gravels are commonly employed as road surfacings. Certain of the more ferruginous laterites, frequently of concretionary character, have long been worked as iron ore and smelted in native bloomeries.

CHAPTER III

CLIMATE

Rainfall is given in inches, temperatures in degrees Fahrenheit, wind force according to the Beaufort scale as recently amended, and cloud amount in the 0–10 scale.

General

Description

THE climate of much of the Congo basin is equatorial and is hot, moist, and fairly cloudy throughout the year. The seasonal change of temperature is very small; there is no dry season on the equator, but two periods of rainfall maxima occur, shortly after the passage of the sun overhead. A definite, though short, dry season appears north of about 3° N. and south of about 3° S. in the winter of the corresponding hemisphere, and there is a decrease in the amount of rain for a few weeks about the middle of the wet season. South of about 9° S. the climate is tropical, with a dry and cooler season in the southern winter. There is a gradual transition from the equatorial to the tropical climate. In the east and south the climate is very much modified by the high ground. The country may be divided into the following climatic regions.

Regions (Fig. 20, p. 69)

First comes the Congo basin, most of which has an equatorial climate. On every side of the old lake basin the ground rises to the African tableland, and where it does so the second region—the perimeter plateau—is in question. In it climate is equatorial or tropical according to latitude. The third region is the Rift valley and the Eastern Highlands (including Ruanda-Urundi). Here climate is much influenced by topography, and is, like the second region, tropical or equatorial according to latitude. The climate of the small coastal area is equatorial, but cooled and dried by the Benguela current. These areas correspond generally to the four vegetation areas described on page 68.

Rainfall (Figs. 13, 14, 15, and 17)

The rainfall generally is abundant. Within the equatorial zone every month is rainy, but the heaviest falls occur in April and October, i.e. in the months after the sun has crossed the equator.

On the northern edge of the equatorial belt, i.e. about the northern frontier of the Belgian Congo, May and August are the wettest months, and December and January are nearly dry. In the southern portion of the colony, which projects farther into tropical as opposed

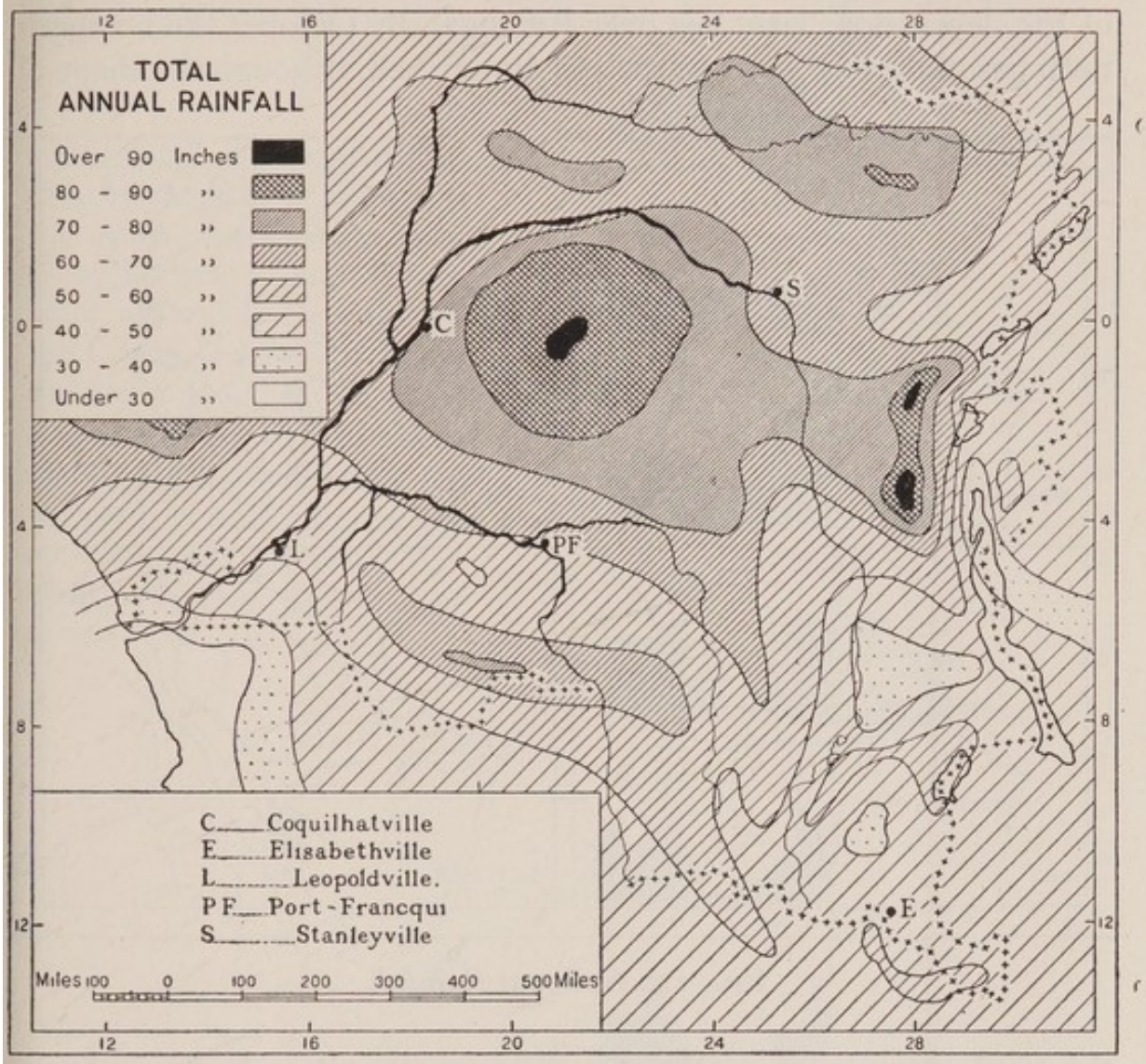


FIG. 13. *Annual Rainfall*

to equatorial regions than any other part of the Congo, there is a dry season from May to September.

Pressure

The Congo river flows not only through a topographical depression —an old lake bed—but also through a barometric depression, the shape of which is roughly a miniature of Africa itself. Broad over the Sahara, this enclosed depression comes to a point in the south, and the whole moves north and south roughly in accordance with the

apparent motion of the sun, but with an appreciable lag. In the southern summer—January—the deepest point of the depression is over the Kalahari. It soon disappears there, however, to reappear in the eastern Sahara in April. Moving north and broadening westwards, the deepest trough is at lat. 20° N. in July, whilst the southern end of the depression 'lake' lies over Katanga. By October the northern deep has moved 15° southwards and diminished, although the shape of

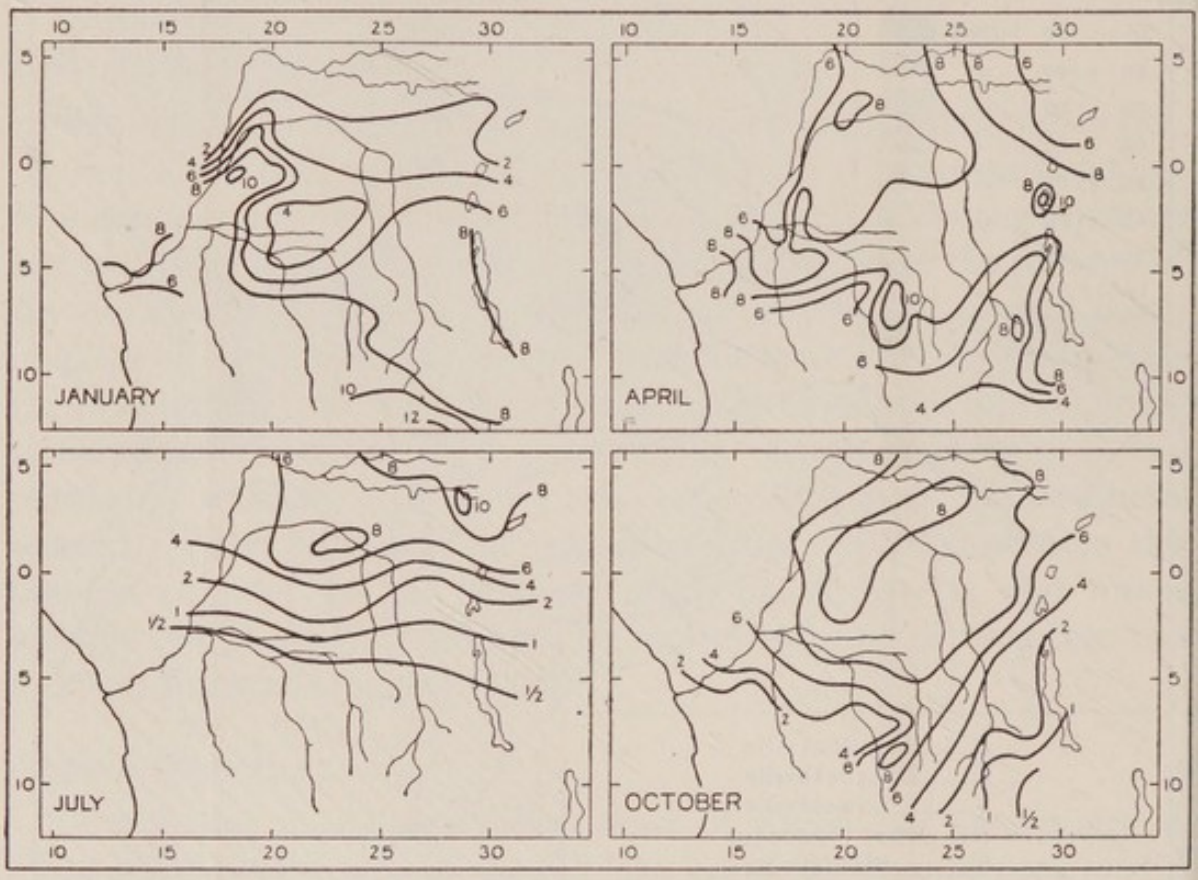


FIG. 14. *Seasonal Rainfall*

the whole depression remains the same; another deep begins to form over Katanga and moves south again to renew the year's cycle. Very roughly, the axis of this pear-shaped depression lies along the meridian 25° E.

Over the year the lowest average pressure is on the extreme northern point of the Congo river, and, where the depression axis crosses the equator, readings vary from 1008 to 1011 millibars at mean sea-level. Very roughly again, the depression shallows outwards—west to the Alantic (a rise of from 4 to 7 millibars), and east to the Indian Ocean, by a similar amount. The wind diagrams show, however, that pressure is greatly influenced by topography, especially upon the western edge of the Rift valley (Fig. 16).

The rainfall, and its distribution by months, as shown in this figure, must not be taken as authoritative for any one place. It is a mean picture for the Congo basin as a whole, and its object is to show graphically how the dry season develops as latitude grows to the north or south. It applies, however, only to the Congo basin and not to districts east or west of it.

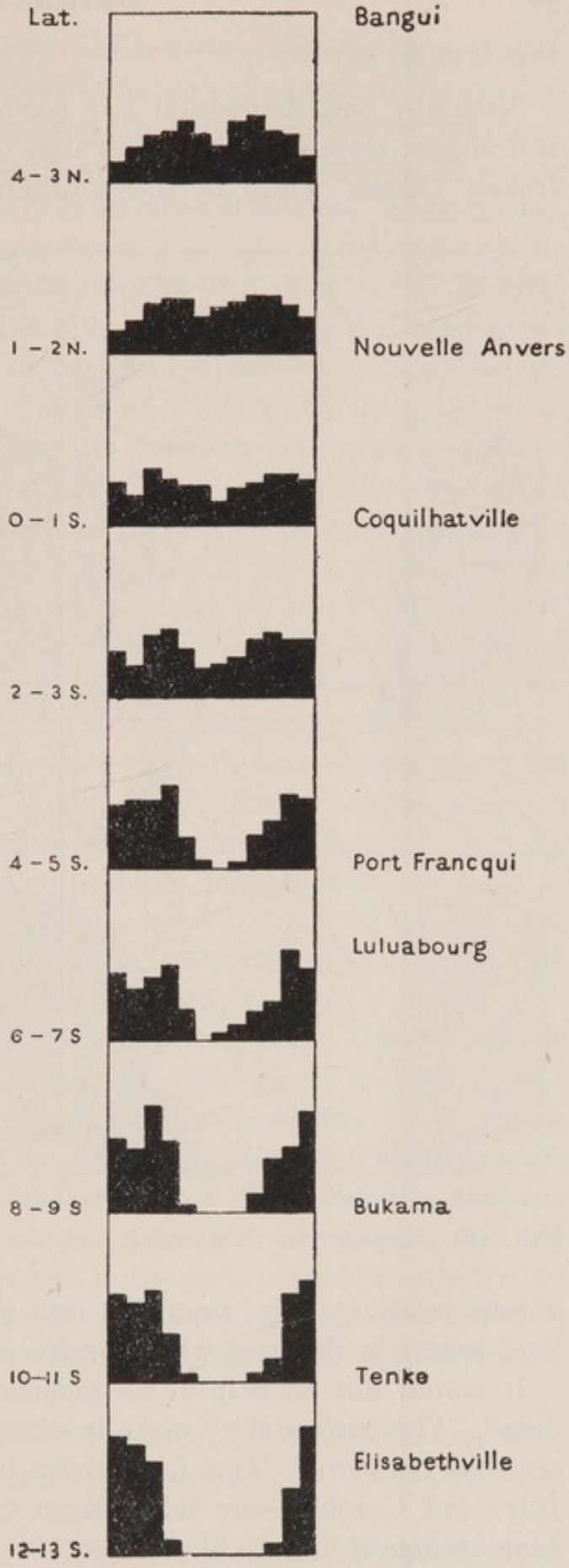


FIG. 15. *Latitude and Rainfall*

Winds (Fig. 16)

Naturally this depression is a focus for the winds to blow into, and almost throughout the year they come from the Atlantic or the Indian Ocean. Only in the southern midsummer do north-east

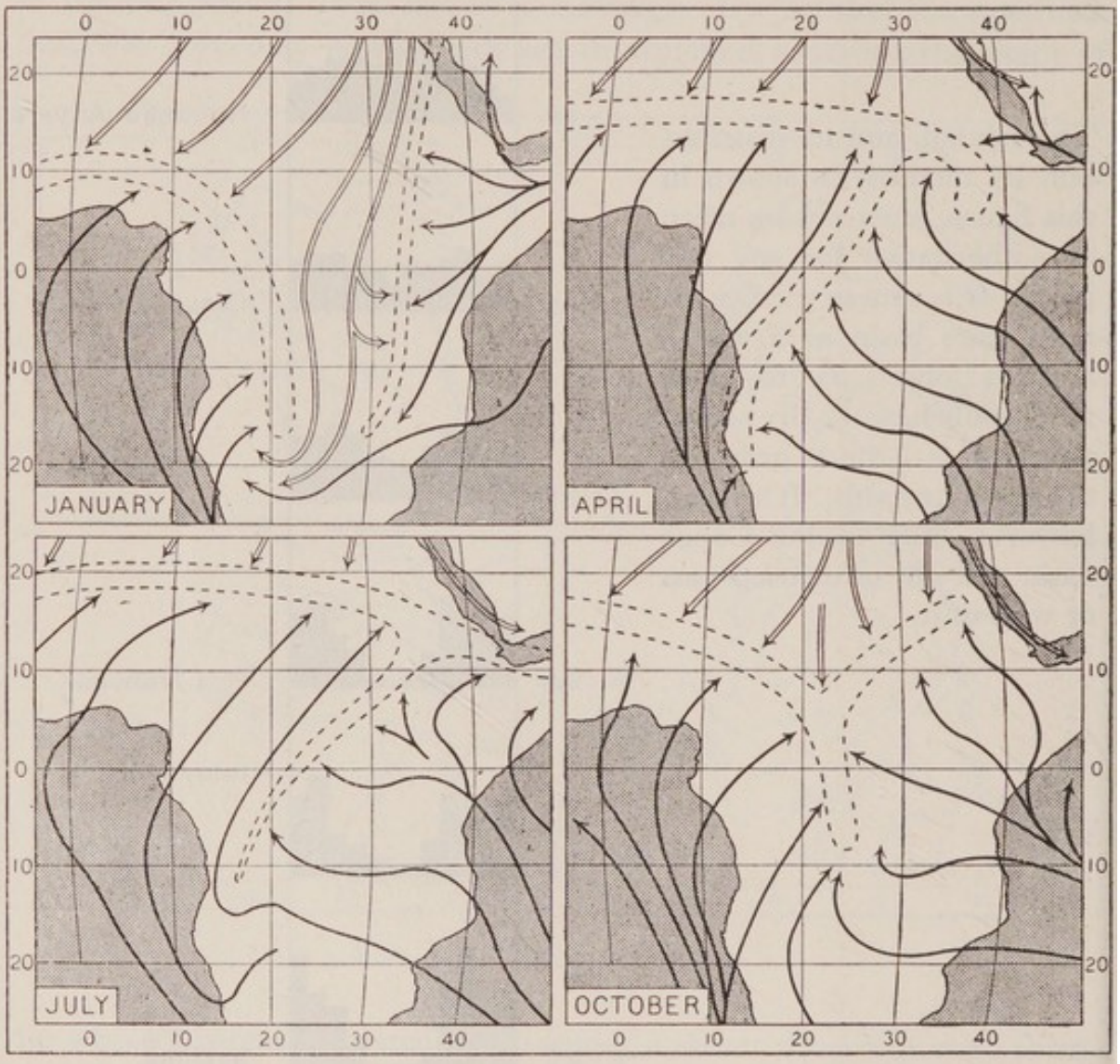


FIG. 16. *Surface Air Movements.* ⟶ Wet Wind. ⟹ Dry Wind

winds, relatively dry, reach far into the Congo. There is a slight land-breeze in the west which begins some hours after sunset.

It would not be helpful to endeavour to describe the winds in detail. The pattern they make is extremely complicated and is best seen in diagrams. The four given herewith—for January, April, July, and October—are taken from Geophysical Memoir No. 55, Meteorological Office, Air Ministry.

Within the Congo basin winds are seldom strong except locally during tornadoes. Properly speaking a tornado is a violent storm,

with an upward spiral movement, which sweeps along a narrow track a few hundred yards wide, and creates havoc in its passage. Generally, but not always, a tornado is accompanied by thunder and lightning, and is followed by a short but heavy deluge. Its origins lie in the atmospheric instability caused by conflicting winds and temperatures. In the Belgian Congo the line between the NE. Harmattan and the SW. monsoon turns southwards early in the year and they meet almost head on, near Coquilhatville and again on the headwaters of the Kasai. In April a similar conflict between easterly winds and the SW. monsoon occurs in the south-west of the Congo, and in October and November a triangular collision occurs just south of the Ubangi. These, then, are the times and areas characteristic of the tornado. More generally it may be said that tornadoes increase from south to north, and are most frequent in April and November. They are rare in July. A tornado is heralded by a bank of dark cloud advancing against the wind. Over the bank a dome-shaped patch of grey marks the approaching rain. The SW. wind dies away and the approaching rain can be heard drumming on the leaves. Then a sudden squall, from the east or north-east, breaks when the rain clouds reach an altitude of about 70°. Roofs may be stripped from houses, steam-boats overturned, and trees uprooted. Finally rain falls in torrents for 10 to 20 minutes, accompanied by peals of thunder overhead and by forked lightning. The end of the tornado, almost as sudden as its break, follows, but rain and lightning may continue for a time and the temperature drops.

At the present time there are no reliable statistics concerning the frequency of these storms. Tornadoes, properly so called, are not distinguished from tropical thunderstorms, nor are local storms which produce a deluge at the station distinguished from distant storms which are heard but not felt. Some of the records, too, are suspect. The best that can be done is to give an estimate, and the general conclusion is that tornadoes in the local sense are experienced throughout the country, occurring as a rule several times in a month except when there is little or no rainfall, and that they are most common in the Elisabethville province.

Tornadoes seem to occur after the heat of the day, that is, after 2 p.m., and cease when the earth, after midnight, has been cooled by radiation.

In the estuary of the Congo the sea-breeze begins in the afternoon and reaches its greatest force, that of a strong breeze, at sunset. Above the estuary, a strong squall from the west or north-west blows up

about sunset, and dies down again after about half an hour. Sometimes the wind increases again from the same direction later in the evening. These night winds are specially characteristic of the dry season. Along the eastern edge of the basin SE. winds prevail from April to November and are strong enough to be reckoned with, averaging about force 3–4. In June and July SE. winds of the same strength are common in Katanga.

Temperature (Figs. 18 and 19)

The temperature is marked by its height and its uniformity. There is no cool season in the equatorial zone. Not that the temperature of the country is absolutely uniform. There is the rise from the coast to the interior, natural to the difference between a sea and a continental climate, but that rise is much modified by altitude. North of the equator the mean temperature of the months from April to September is higher than the yearly mean, and the mean temperature from October to May is lower, while south of the Line it is the reverse. The seasonal range of temperature is small, while the daily range varies with the season and the locality. It is large in the south in the dry season, e.g. at Elisabethville from June to September it averages 35° or over. In many regions the average range is about 15–20°.

Regional

The Congo Basin (Figs. 17, 18, and 20, Plates 13 and 14)

Whilst the drainage basin of the Congo extends outside Belgian territory, the Congo itself flows through the old lake-bed and lies wholly within equatorial regions. It is within this old lake-bed that the Belgian portion of the wet equatorial forest belt lies. The forest is spread over the lower and wetter parts of the country, which may be called the rain-forest lowland. Eala, Nouvelle Anvers, and Stanleyville lie within it. The area is one of dripping leaves, pools, great evaporation, morning mists like cotton-wool on the tree-tops, and general steaminess. 'Into these primeval forests', writes Dr. Livingstone of similar country, 'the sun, though vertical, cannot penetrate, excepting by sending down at mid-day thin pencils of rays into the gloom. The rain water stands for months in stagnant pools made by the feet of elephants.' The forest might be considered a subdivision of the Congo basin.

It used to be thought that this forest itself increased rainfall. It is now established that the main purposes it serves are to yield vegetable

products and to prevent erosion by the tropical rains. The Great Equatorial Forest and the other forests of the Congo have no appreciable influence upon the quantity or regime of rains in the colony.

The average monthly rainfall, mean annual rainfall, and number of days with rain are given in the Appendix for a series of stations in

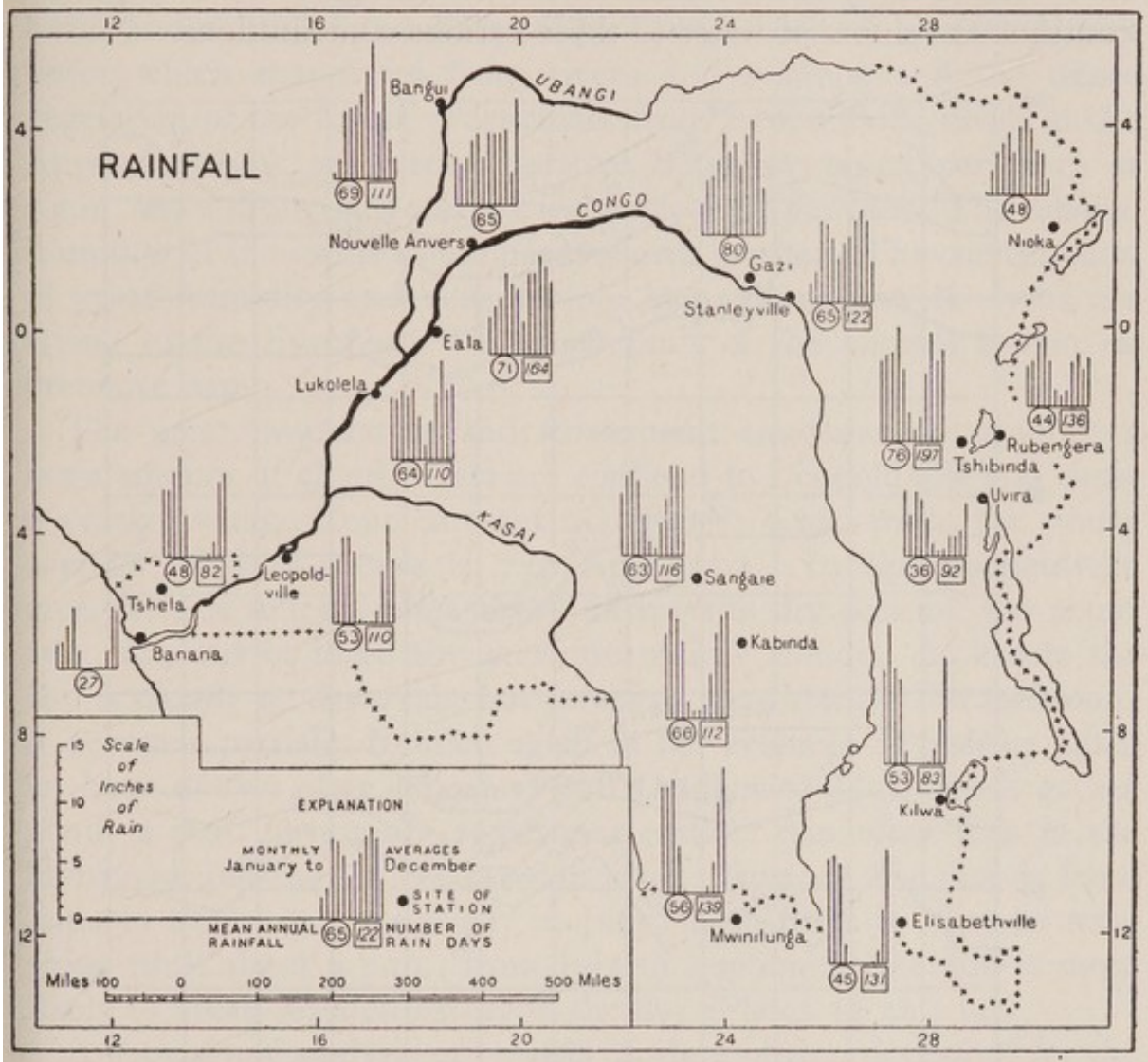


FIG. 17. *Local Rainfall*

this area. The rainfall of these stations, and of a few others taken from reliable sources, is illustrated in Fig. 17. For Leopoldville three types of rain-day have been given: those with slight rain, those with moderate amounts, and days with considerable or heavy rain. For the first the observations cover a longer period than for the other two, and that is the reason for apparent inconsistencies, e.g. in June and August.

As the basin of the Congo extends on both sides of the equator the wettest periods vary and the northern and southern tributaries

are in flood successively. The Ubangi and Sanga begin to rise in March. Their floods reach the river Congo in April, attain their maximum in October, and shrink in December. The Lualaba, Lomami, and Kasai, on the other hand, are in spate in October and March, swell the river Congo in November, and reach their maximum in February and March. The lower Congo owes its large and continuous volume of water to these various contributions.

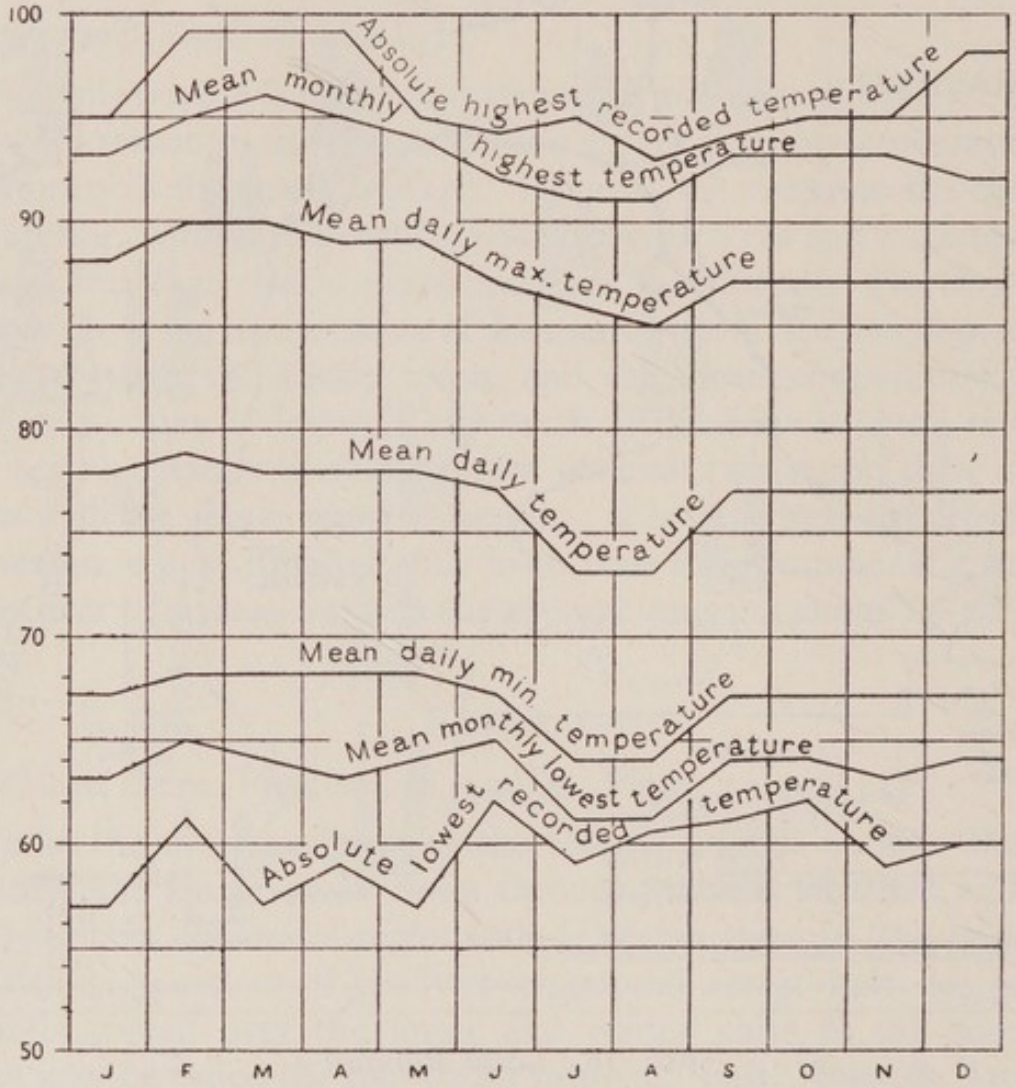


FIG. 18. *Temperature, Eala*

Statistics of temperature, by months, are given in the Appendix, for most of the same series of stations, including Eala. Fig. 18 illustrates the mean daily temperature of Eala, and also the mean daily maxima and minima, and shows a small rise in February and a small drop in July and August. The means of the highest and of the lowest in each month show similar curves, while the absolute highest and lowest—naturally more fortuitous—are also plotted.

The daily range of temperature is about 20°. It is a little lower in the rainy season; for example, the average range at Leopoldville from October to April lies between 16° and 18°.

For data of the humidity and cloud of the Congo basin we are dependent upon observations taken at Leopoldville, which lies in the region of the cataracts and coastal hills, on the edge of the basin and south of the Line. The Congo basin is saturated with water which evaporates from rivers and swamps and the dense vegetation of the forest. Particulars from Leopoldville given in the Appendix show an average relative humidity of 93 per cent. at 7 a.m. and a mean daily relative humidity of 81 per cent. The relative humidity of the inside of the basin is even greater. The combination of great humidity and considerable heat throughout the year are trying to the European. The great fault of the climate lies in its excessive damp.

The great evaporation and subsequent condensation produce a large amount of cloud. Data are confined to Leopoldville and show a yearly average cloud amount of 8·8 at 7 a.m., while the yearly average of daily means is 7·0 (Appendix). In the Leopoldville area there is much stratus cloud during the dry season. On about two days out of three the skies are mainly cloudy. As a rule the sky is cloudy at daybreak, but tends to clear during the forenoon; it becomes partially clouded again in the evening, and clears again an hour or two after sunset. From October to May clouds gather about 2 p.m. or 3 p.m., sometimes earlier; rain often falls in the afternoon, but the sky clears again later. Skies are also cloudy from June to September, especially in June, when there is often no sunshine until about 3 p.m.; from July to September the sun is more likely to break through earlier in the day (Plates 13 and 14).

A provisional analysis of records of 'days of thunderstorm' for the period 1935–1940 yields the following annual averages: Stanleyville, 58; Kongolo, 61; Gemena, 85; Lusambo, 89; Leopoldville, 51. A similar analysis of 'days of fog' shows: Stanleyville, 147; Coquilhatville, 136; Gemena, 76; Lusambo, 171; Leopoldville, 55. These figures show general averages of nearly 69 days of thunderstorm and of 117 days of fog in this region, but days of thunderstorm and of fog have yet to be defined.

Between June and September there are frequent morning fogs in the river valleys, but these clear during the forenoon. A dry afternoon haze is typical of this season.

Observations of wind at Leopoldville show that half the mornings

and one-third of the twenty-four hours are calm. The prevailing winds are south-westerly. Westerly and southerly winds are also common. The windiest months are generally from May to September. The winds are usually only light airs, blowing at from 1 to 3 miles per hour—too light to be of any importance.

The Perimeter Plateau (Figs. 17 and 19)

Around the basin of the Congo the land rises on all sides. On the north an upland region separates the basins of the Congo and of Lake Chad. On the north-east lies the divide between the waters of the Congo and those of the Nile. To the east are the plateaux bordering the mountains of the western Rift valley. The Katanga region, in the south-east, is an extension, from the south, of the worn surface of the African tableland, and resembles Northern Rhodesia. On the south-west and west the boundary with Angola runs in steps, north and then west, following or cutting the headwaters of tributaries to the Congo, but west of the boundary lies a plateau which is cut by the Congo river and then continues north again in French Equatorial Africa. This completes the perimeter of the basin.

The perimeter plateau is most complete in the south, where the African tableland is reached and the climate is not equatorial but tropical. Elisabethville may be taken as a good example. Its mean daily maximum, mean, and mean daily minimum temperatures are shown in Fig. 19 and its average rainfall in Fig. 17. These diagrams show the definite marks of a tropical climate—wet and dry seasons and a general drop in temperature which is partly due to the transition from the equatorial climate and partly to altitude. As the town is situated in the southern hemisphere the dry season lasts from April to September–October, when the thermometer is lowest, i.e. during the southern winter. The average daily mean pressure, reduced to M.S.L., is 1,010 millibars (29·83 inches), or slightly below the normal. Particulars of average rainfall and average mean temperature on the plateau are also contained in the Appendix. The daily range of temperature is large: the mean daily range varies from 20° about February to 45° about July. During the dry season (May–September) there is little cloud; small cumulus in the morning tends to disappear later in the day, and roughly three-quarters of daylight hours are sunny. Of all parts of the Belgian Congo the climate of southern Katanga is the most congenial to the European. The European standard stock cannot thrive without an annual cold spell. Katanga lies outside the area of the equatorial climate and half of it is over

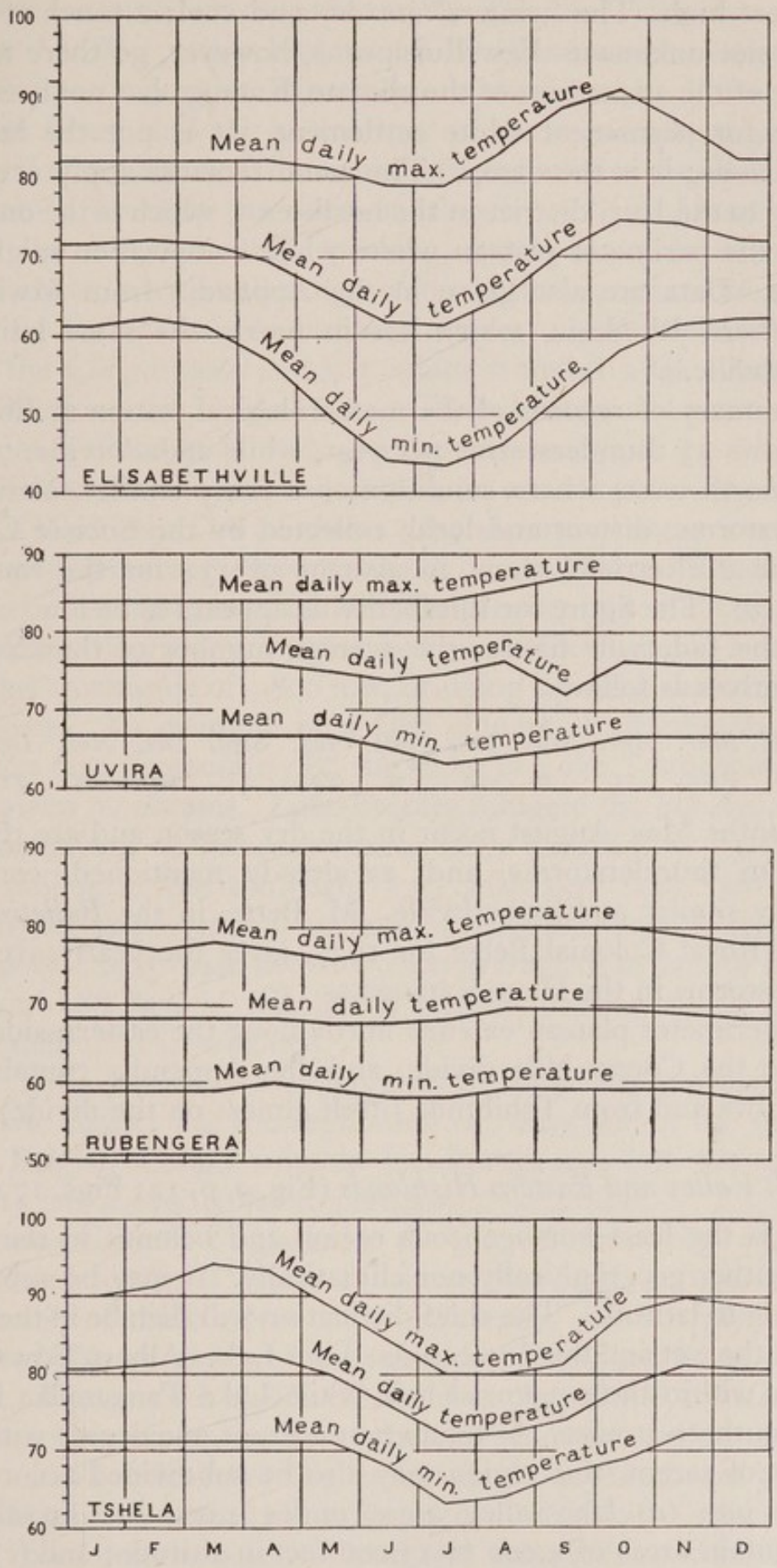


FIG. 19. *Temperature : Elisabethville, Uvira, Rubengera and Tshela*

3,000 feet high. The 'winters' are dry and cool: a touch of frost at night is not unknown. Few Europeans, however, go there to settle. In spite of the attractions of the climate, Katanga has not been found suitable for permanent white settlement. It is not the heat that is pernicious; it is the damp. The same remarks apply even more strongly to the Ituri district in the north-east, which is the only other part of the perimeter plateau where white colonization might seem possible. Data are also given in the Appendix from Mwinilunga in Northern Rhodesia, which lies in nearly the same latitude as Elisabethville.

A summary of records of the meteorological station at Elisabethville shows 43 thunderstorms per year, while at Jadotville, 75 miles to the north-west, where conditions are fairly similar, statistics of thunderstorms, distant and local, collected by the Société Générale Africaine d'Électricité show an average of 131 for the four years 1936–1939. The figure for Elisabethville appears to be low. According to the Jadotville figures the average number of thunderstorms per month is as follows:

Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Year*
26	20	16	11	0	0	0	0·2	2	10	25	21	131

The months May–August occur in the dry season and are therefore free from thunderstorms, and, as already mentioned, conditions are fairly similar at Elisabethville. M. Bette, in the *Bulletin* of the Institut Royal Colonial Belge for 1937, gives the yearly average of thunderstorms in the Haut-Katanga as 150.

The perimeter plateau extends north along the eastern side of the basin to the Congo–Nile divide, and the Appendix contains data from Kilwa and from Tshibinda (itself almost on the divide).

The Rift Valley and Eastern Highlands (Fig. 5, p. 12; Figs. 17 and 19)

This is the least homogeneous region and belongs to the Congo basin neither geographically nor climatically. It may be subdivided according to latitude. The chief distinction will then be in the occurrence of the wet and the dry seasons. Thus Lakes Albert, Edward, and Kivu lie within the equatorial belt, while Lake Tanganyika belongs to the southern tropics. As temperature drops one degree with every 300 feet of ascent, this region may also be subdivided according to altitude into (*a*) lake-valley areas under 4,000 feet in altitude; (*b*) mountain areas of 4,000 to 13,000 feet in altitude; and (*c*) alpine areas, over 13,000 feet in altitude. These correspond to the division of

vegetation contained on pages 81 and 83. The lake-valley areas correspond to the 'Rift valley bottom'. The alpine areas are the 'alpine zone', and the mountain climate areas comprise the 'lower slopes, mountain forest, and sub-alpine zone of the mountain ranges'.

Lake-Valley Climate. This subdivision includes the Western Rift valley which contains the chain of lakes from Lake Albert to Lake Tanganyika and, generally speaking, has a moist lake and river valley climate, with small range of temperature, malarious and unhealthy for Europeans. As has been stated, the atmospheric depression of the Congo basin sucks in winds from all sides. On the east these come from the Indian Ocean. They rise and cool in crossing the mountains of Ruanda-Urundi and the eastern side of the Rift valley. As they descend into the valley they become hot and dry, like the 'Föhn' of the Alps. This produces a dry savanna or steppe vegetation.

This description applies particularly to Lakes Albert (2,000 ft. above sea-level), Edward (3,000 ft.), and Tanganyika (2,500 ft.), and to the torrid plains lying between them, and in a lesser degree to Lake Kivu, which has an altitude of 4,800 feet, bringing it within the range of the hill climate. An example of a lake climate is afforded by Uvira, which lies on a promontory on the shore of Lake Tanganyika, at the foot of steep mountains. Lake-breezes mitigate the hot climate, and the temperature therefore remains fairly constant at 75·5°, while the rainfall is of the southern type, with very little rain in July and August. A provisional analysis of records from Costermansville for the period 1935–1940 shows a yearly average of 28 days of thunderstorm and 188 days of fog, but is subject to the previous criticism that no definition is provided.

Lake Kivu has been mentioned as in some respects exceptional. The Kivu district has the reputation of being one of the few spots in the Belgian Congo suitable for Europeans, but the excessive humidity has proved a bar to permanent settlement.

Mountain Climate. A glance at the physical map (Fig. 5) and the physical description (Chapter II) shows that large parts of Ruanda-Urundi and of the borders of the Rift valley rise sharply from the perimeter plateau and are consequently colder and have a heavier rainfall. The parallel highlands which enclose the Rift valley reach altitudes of 6,500–10,000 feet. In this climatic region the total annual rainfall varies according to altitude, from 50 inches at 5,500 feet to a maximum of 100 inches at 8,000 feet. Humidity increases, with ascent, to saturation point. Cloud and mist reduce insolation to a minimum, and mean annual temperature decreases to 38° at about

13,000 feet. Rubengera may be selected as an example of the whole sub-region. The mean daily maximum, mean, and mean daily minimum temperatures are shown in Fig. 19, and the rainfall in Fig. 17. From them we observe a short dryish season from June to August, corresponding to a slight increase in the daily temperature range. Nyundo stands higher and is colder and wetter.

Owing to its equatorial climate, Ruanda-Urundi has a smaller seasonal range of temperature than Katanga and is less suited to European settlement.

Alpine Climate. Between Lake Albert and Lake Edward, Ruwenzori rises to 16,800 feet, while south of Lake Edward the Mfumbiro or Virunga volcanoes reach 15,000 feet. Above 13,000 feet showers are lighter but more continuous. Humidity is high. The mountain tops are often concealed by cloud or mist. Mean annual temperature decreases to about 35° at 14,000 feet with a range of only 6°. At 15,000–16,000 feet is a cap of perpetual snow.

Coast (Figs. 17 and 19)

The only station for which observations over a sufficient period are available is Tshela. A diagram of the temperature and the diagram of local rainfall show a dry season from June to October, corresponding to a drop in the mean temperature from July to November. A feature of this region is the Benguela current which cools and dries the westerly winds. The low rainfall and regular sea-breeze are grateful to the European, but there is a risk of contracting a severe chill by sitting out in the breeze after a day of broiling heat.



13. *Rain clouds over dense forest near Libenge*



14. *Cumulus cloud over Leopoldville*



15. *Mangrove forest near Malela (Congo estuary). Raphia palms in foreground; Stilt roots in centre*



16. *Limba* (Terminalia superba) *showing basal buttresses*

APPENDIX

METEOROLOGICAL TABLES

(Supplied by the Director of the Meteorological Office)

Units of Measure. Temperatures (in the shade) are given in degrees Fahrenheit, rainfall in inches, pressure in millibars at m.s.l., and heights in feet above m.s.l. Relative humidity is expressed as a percentage and cloud amount in the 0–10 scale. A 'day with rain' is one with 0·1 mm. or more, unless otherwise specified.

CONGO BASIN

EALA[1] (0° 03′ S., 18° 21′ E.; 1,115 ft.)

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Year*
Temperatures													
Mean daily . .	78	79	78	78	78	77	73	73	77	77	77	77	77
,, maximum	88	90	90	89	89	87	86	85	87	87	87	87	88
,, minimum .	67	68	68	68	68	67	64	64	67	67	67	67	67
Absolute highest recorded . .	95	99	99	99	95	94	95	93	94	95	95	98	99
Mean of highest in each month . .	93	95	96	95	94	92	91	91	93	93	93	92	96[2]
Absolute lowest recorded . .	57	61	57	59	57	62	59	61	61	62	59	60	57
Mean of lowest in each month . . 14 years' observations	63	65	64	63	64	65	61	61	64	64	63	64	60[3]
Rainfall													
Total rainfall . .	3·3	4·2	5·0	7·0	6·2	5·7	2·8	7·0	7·0	8·5	7·6	6·3	70·6
No. of days with rain 12 years' observations	9	9	14	15	16	17	8	13	16	17	17	13	164

[1] Rainfall and raindays at Eala 0° 1′ N., 18° 30′ E. [2] Mean of highest each year. [3] Mean of lowest each year.

KABINDA (6° 8′ S., 24° 30′ E.)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
Temperatures													
Mean daily maximum 5–6 years' observations	84	84	84	86	90	89	89	87	85	85	84	83	86
Mean daily minimum 4–5 years' observations	68	67	67	68	70	68	65	65	68	69	69	68	68
Rainfall													
Total rainfall . . 6 years' observations	7·4	9·6	8·7	6·7	1·6	0·7	0·7	1·3	3·8	7·5	8·9	9·6	66·5
No. of days with rain 5–6 years' observations	13	13	15	12	4	1	1	4	8	12	13	16	112

LEOPOLDVILLE (4° 20′ S., 15° 18′ E.; 1,066 ft.)

Mean daily maximum	87	88	89	89	88	84	81	84	87	88	87	86	86
Mean daily minimum	70	71	71	71	71	67	64	65	68	70	71	70	69
Mean daily . . 8 years' observations	79	79	80	80	79	75	73	74	77	79	79	78	78
Absolute maximum .	96	96	97	95	95	93	90	95	96	96	94	97	97
Absolute minimum . 6 years' observations	65	65	67	67	64	59	59	59	62	59	62	63	59
Relative humidity													
Mean of day . .	82	80	79	81	84	84	84	78	73	83	83	84	81
7 a.m. . . . 2 years' observations	96	93	88	93	95	96	96	92	81	96	95	96	93
Cloud amount													
Mean of day . .	7·7	6·4	6·8	7·1	7·5	7·0	7·0	6·6	7·0	7·1	6·7	6·6	7·0
7 a.m. . . . 2 years' observa-	9·1	7·9	8·4	7·5	9·0	9·6	9·4	8·7	8·9	9·0	8·6	9·7	8·8

Total rainfall . .	5·3	5·7	7·7	7·7	6·2	0·3	0·1	0·1	1·2	4·7	8·7	5·6	53·3
No. of days with rain 0·1 mm. rain or more 12 years' observations	11	11	12	16	12	1	0·1	0·6	5	11	16	15	110
No. of days with more than 1 mm. . .	11	7	10	14	9	2	0	1	4	9	13	10	90
No. of days with more than 10 mm. . 6 years' observations	5	4	5	6	3	1	0	1	1	4	7	5	42
Thunderstorm													
No. of days with .	7	6	7	1	7	1	0	1	2	4	8	7	51
Fog													
No. of days with fog .	2	2	2	7	6	14	15	3	3	0	0	1	55

SANGAIE (4° 55′ S., 23° 38′ E.)

Temperatures													
Mean daily maximum	85	86	87	87	89	87	87	85	86	86	86	84	86
Mean daily minimum 8–9 years' observations	67	68	68	67	68	65	62	64	65	66	67	67	66
Rainfall													
Average rainfall .	5·5	6·9	7·3	6·5	3·5	1·1	0·6	2·9	5·0	7·9	7·9	7·6	62·7
No. of days with rain 11–12 years' observations	12	11	13	13	8	2	1	5	10	13	15	13	116

STANLEYVILLE (0° 26′ N., 25° 14′ E.)

Rainfall													
Average rainfall .	1·7	2·7	7·2	6·9	5·6	4·0	5·2	5·8	7·2	8·2	7·2	3·7	65·4
No. of days with rain 5–6 years' observations	6	7	10	9	11	8	11	10	13	13	15	9	122

PERIMETER PLATEAU

ELISABETHVILLE (11° 39′ S., 27° 28′ E.; 4,035 ft.)

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Year*
Pressure													
Daily mean . . 12–15 years' observations	1007	1007	1008	1010	1012	1015	1015	1013	1009	1007	1007	1007	1010
Temperatures													
Mean daily maximum	82	82	82	82	81	79	79	83	89	91	87	82	83
Mean daily minimum 18–21 years' observations	61	62	61	57	50	44	43	46	52	58	61	62	55
Rainfall													
Total rainfall . . 15 years' observations	9·1	9·5	8·7	1·7	0·2	0	0	0·01	0·1	1·1	4·8	10·1	45·3
No. of days with rain 9–10 years' observations	22	23	24	13	1	0	0	0·3	0·4	5	17	25	131

KILWA (9° 14′ S., 28° 26′ E.)

Temperatures													
Mean daily maximum	86	86	85	88	89	83	83	85	89	90	86	83	86
Mean daily minimum 2–5 years' observations	68	69	67	67	67	60	59	60	66	69	68	67	66
Rainfall													
Average rainfall .	8·3	12·3	8·4	7·4	1·3	0·0	0·0	0·0	0·2	1·5	4·1	9·4	52·9
No. of days with rain 4–5 years' observa-	14	16	14	10	2	0	0	0	0·6	3	9	14	83

MWINILUNGA, NORTHERN RHODESIA (11° 43′ S., 24° 26′ E.; 4,449 ft.)

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Year*
Temperatures													
Mean daily maximum 11–12 years' observations	80	80	81	83	82	82	81	83	89	88	84	80	83
Mean daily minimum 10–12 years' observations	62	63	62	61	52	46	44	48	56	60	61	62	56
Rainfall													
Average rainfall . 12 years' observations	9·2	9·1	9·9	4·2	0·2	0·0	0·0	0·0	0·9	2·9	8·1	11·2	55·7
No. of days with rain 11–12 years' observations	24	22	21	10	1	0·1	0	0·4	4	10	21	25	139

TSHIBINDA (2° 19′ S., 28° 45′ E.; 6,939 ft.)

Temperatures													
Mean daily maximum	70	70	70	69	68	68	69	71	71	71	70	69	70
Mean daily minimum 9 years' observations	52	52	52	53	53	50	48	48	50	51	51	51	51
Rainfall													
Total rainfall . .	7·4	7·5	7·7	10·1	6·3	2·6	1·1	2·2	6·0	9·6	7·1	8·0	75·6
No. of days with rain 9 years' observations	18	17	21	21	18	9	5	8	17	23	22	18	197

RIFT VALLEY AND RUANDA–URUNDI

NYUNDO, RUANDA–URUNDI (1° 42′ S., 29° 19′ E.; 6,168 ft.)

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Year*
Temperatures													
Mean daily maximum 6–7 years' observations	73	74	72	72	71	71	71	73	73	73	72	73	72
Mean daily minimum 7–8 years' observations	57	57	57	58	58	56	56	57	56	57	56	56	57
Rainfall													
Average rainfall .	4·1	4·6	7·2	7·4	4·6	2·5	1·0	2·6	4·7	5·8	4·3	4·5	53·3
No. of days with rain[1] 7–8 years' observations	18	18	23	23	18	10	6	8	16	20	20	19	199

RUBENGERA, RUANDA–URUNDI (2° 03′ S., 29° 25′ E.; 5,577 ft.)

Temperatures													
Mean daily maximum	78	77	78	77	76	77	78	80	80	80	79	78	78
Mean daily minimum 8–9 years' observations	59	59	59	60	59	58	58	59	59	59	59	58	59
Rainfall													
Average rainfall .	3·7	4·0	5·6	6·1	4·0	1·6	0·9	1·5	4·0	4·8	3·3	4·4	43·9
No. of days with rain[1] 8–9 years' observations	13	12	15	18	12	5	3	3	11	14	14	16	136

[1] Days with over 0·004 inches of rain.

UVIRA (3° 24′ S., 29° 09′ E.; 2,625 ft.)

	Jan.	*Feb.*	*Mar.*	*Apr.*	*May*	*June*	*July*	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Year*
Temperatures													
Mean daily maximum	84	84	84	84	84	84	84	85	87	87	85	84	85
Mean daily minimum 8 years' observations	67	67	67	67	67	65	63	64	65	67	67	67	66
Rainfall													
Average rainfall .	5·8	3·5	5·6	5·0	3·3	1·1	0·5	0·6	1·8	1·7	2·3	4·7	35·9
No. of days with rain[1] 8–9 years' observations	12	9	12	13	7	3	0·9	0·9	5	8	10	11	92

COASTAL AREA

TSHELA (4° 57′ S., 13° 0′ E.)

Temperatures													
Mean daily maximum 5–6 years' observations	90	91	94	93	89	84	80	80	81	88	90	89	87
Mean daily minimum 4–5 years' observations	71	71	71	71	71	68	63	64	67	69	72	72	69
Rainfall													
Average rainfall .	6·1	5·9	7·4	8·8	3·6	0·1	0·0	0·03	0·4	1·5	6·5	7·4	47·7
No. of days with rain 5–6 years' observations	11	9	10	12	8	0·3	0·2	0·8	4	5	11	11	82

[1] Days with over 0·004 inches of rain.

CHAPTER IV

VEGETATION

(Fig. 20)

THE vegetation of the Belgian Congo alters very much as does the topography, and it is possible to recognize four distinct regions which coincide closely with physical divisions. The most important region is that of the central Congo basin and the surrounding slopes to the north, south, and west. On the coast is a very small and relatively unimportant region, while, to the east, the mountain ranges on both sides of the Central African Rift valley have a special series of plant communities not found elsewhere in the Congo. Finally, in the south-east corner (Katanga) the vegetation of the relatively high plateaux closely resembles that of Northern Rhodesia, Nyasaland, and parts of Tanganyika Territory. Within these four primary regions plant life is modified by variations in altitude, rainfall, and soil, which interact to produce different types depending on the degree in which one or other of the external conditions predominates. The whole of the country lies within the tropical zone, and it is therefore only on the eastern mountains, where the greatly increased altitude lowers the temperature sufficiently, that we get a plant life which is not tropical in character. The four vegetation areas will be dealt with in the following order: (1) Coastal Region; (2) Central Basin; (3) Eastern Mountains (including Ruanda-Urundi); (4) Katanga, or South-eastern Plateau Region.

Coastal Region

The Coast Itself (Plate 15)

Owing to the very short coastline of the Belgian Congo this region is necessarily small, but is of some importance because it includes the mouth of the Congo which is the main and direct entrance to the colony. Two sub-regions can be recognized: (*a*) the coast itself with its special vegetation, and (*b*) the immediate hinterland, which is transitional to the central basin. The true coastal vegetation can be divided again into two main parts. Between the Cabinda border and Banana, at the mouth of the Congo, the sandy shore, backed by low cliffs, is thinly covered by herbaceous plants, mainly grasses, but there are no true dunes. In the estuary of the Congo above Banana, however, is a network of creeks lined by mangrove and other coastal forests,

stretching as far as Mateba island, below Boma. The mangrove forests, which are much better developed in the neighbouring French Equatorial Africa, only occur below high-tide level, forming a girdle of varying width along the main banks or encircling the numerous

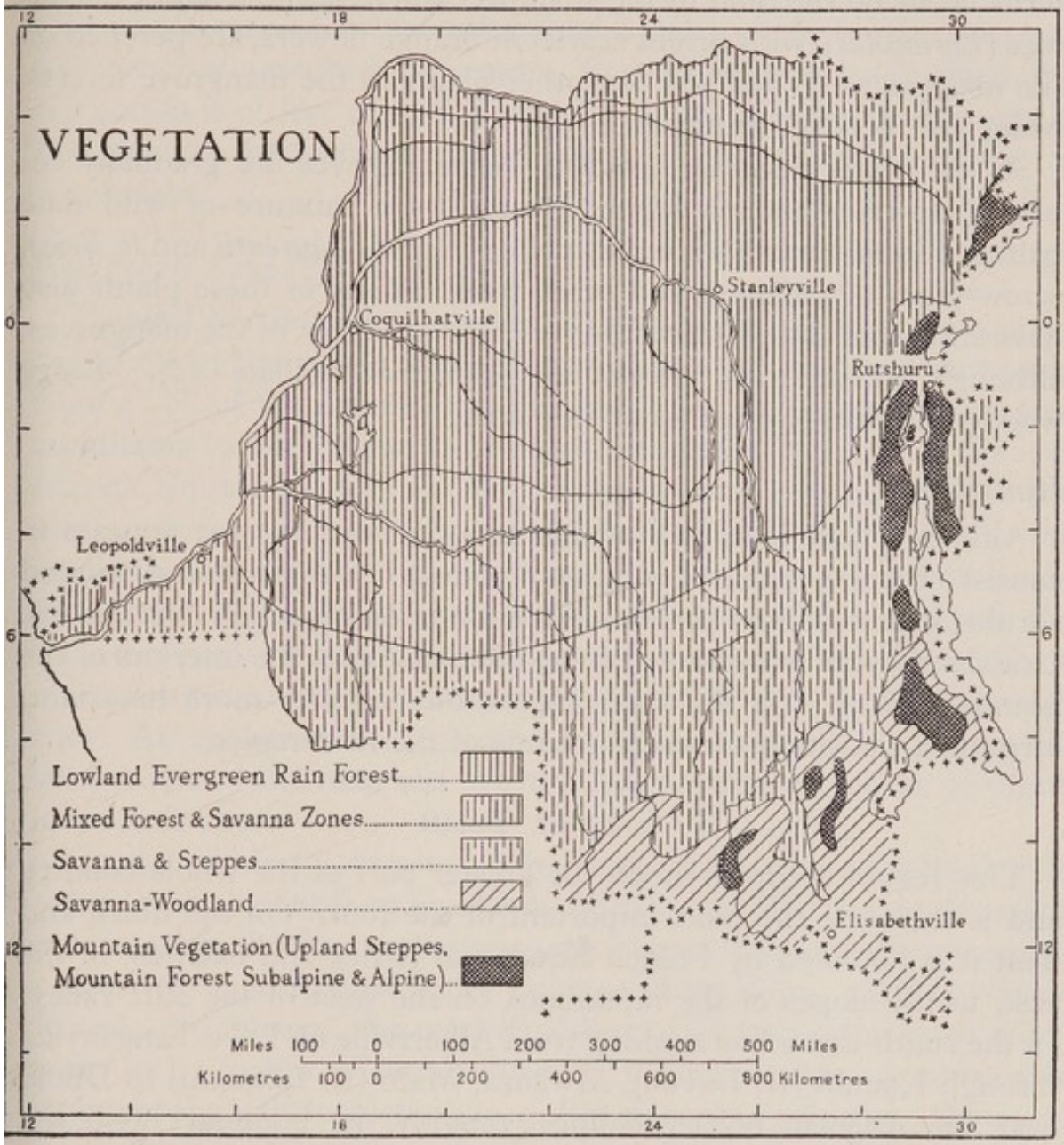


FIG. 20. *Vegetation Areas*

islands. The chief constituents are the common mangroves, *Rhizophora mangle* and *Avicennia nitida*, but several other trees or large shrubs are associated with them. All the species grow in mud which is covered at high tide with salt or at least brackish water. The plants have hard, leathery, dark leaves, and the stems are often pale grey. *Rhizophora* is supported in the soft mud by numerous 'stilt' or 'prop' roots joining the stem as much as 20 feet above the mud and

forming with the true stems an interlacing and almost impenetrable thicket. In *Avicennia* special breathing roots, like pointed stakes, project several feet above the mud. These are made necessary by the waterlogged mud in which the ordinary roots spread. A few large ferns occur on the mud in the shallower water, while tropical mistletoes (*Loranthus*), with bright scarlet or orange flowers, are perched on the mangroves. There are few other plants in the mangrove forests. Mangrove bark is an important tan.

As the water becomes less salt the mangroves are gradually replaced up-river and on higher ground by a mixture of wild date palms (*Phoenix reclinata*), raphia palms (*Raphia Laurentii* and *R. Sese*), screw-pines (*Pandanus*), and other trees. Many of these plants also have stilt roots and this forest is very similar to that of the mangroves, although much more varied in appearance (Plate 15). Large woody climbers (lianes) occur in places.

Hinterland

Although little is known of this area, its western part appears to consist of open, rather dry, grassy plateaux with scattered stunted shrubs, intersected by shallow and more or less wooded depressions. Grassland, with or without shrubs, often occupies the interiors of the islands. Farther up the river vegetation becomes more luxuriant, forming a transition to the grasslands of the next region.

Central Basin

This region occupies much the greater part of the whole country and is therefore the most important of the four. On the north and west it is bounded by French Equatorial Africa and extends, in the east, to the slopes of the mountains on the west of the Rift valley. In the south-east a line running from Albertville on Lake Tanganyika through Kiambi (R. Luvua), Mwanza, Mato (R. Lomami) to Dilolo near the Angolan border defines, roughly, its boundary with the Katanga region. The country west of Stanley Pool as far as Boma on the Congo, though actually outside the central basin, is included here, since the vegetation is similar to that farther east in the basins of the rivers Kwango and Kasai.

In spite of the great extent of this region, the vegetation falls naturally into two main classes, namely forest and savanna, though both vary greatly according to topography and soil. Most of the centre of the basin, including practically all the lower ground, is covered by tropical evergreen rain-forest, while the surrounding

slopes are occupied by savanna, that is, grassland with a varying number of trees or shrubs or both. The border between these two main types is not clearly defined, especially in the south, where large areas of forest or savanna may be found in regions covered predominantly by the other type. The distribution of the two types is mainly determined by the rainfall, and particularly by the presence or absence of a marked dry season. Forest grows normally where the dry season is of less than two months' duration, whereas savanna is characteristic of a climate which has a dry period of from three to six months.

The Forest Zone (Plates 16 and 17)

Tropical Evergreen Rain-forest. As already indicated, this occupies the whole of the centre of the Congo basin stretching approximately from 4° N. of the equator to 4° S. and from the base of the eastern mountains to the frontier in the west, beyond which it extends into French Equatorial Africa, the Cameroons, and west Africa. In the east a narrow band of forest in the Semliki river valley follows the northern slopes of the Ruwenzori range to join up with similar forest in Uganda. Essentially this is a zone of lower ground, in which the typical rain-forest climbs only to 4,800 feet; above, it is replaced by a type transitional to the true mountain forests which will be dealt with later. An important separate area of forest occurs in Mayumbe, on the borders of Cabinda and Moyen Congo, with the forests of which it is continuous.

On the whole the forest is only developed in regions with a total annual rainfall of at least 60 inches, fairly evenly distributed throughout the year. In the north and south a short relatively dry period of one or two months may occur in some forest areas, while at higher altitudes, in the east, the total rainfall may fall below the usual minimum of 60 inches. Temperatures in the forest area are uniformly high and show little fluctuation, either seasonal or diurnal. Owing to the dense vegetation cover, the humidity, both absolute and relative, is also invariably high.

In general the forest is evergreen, but some deciduous trees occur, and these increase near the outskirts where the climate approaches that of the surrounding savannas. The canopy formed by the tree crowns is dense and continuous and usually at least 90 feet high. There are, however, much taller trees and the upper surface of the canopy is very irregular, each large rounded crown tending to be distinct. Seen from an eminence the surface is rather like an expanse

of cumulus clouds. In addition to the main tree-layer there are often lower layers of smaller trees.

Below the canopy the erect trunks often reach a height of over 50 feet before branching, and often have buttress-like outgrowths near the base (Plate 16). The buttresses may extend to 20 feet or more above the ground, and may be plank-like or rounded, continuous or otherwise with the trunk at the base, often very sinuous, and showing every gradation to a mere fluted trunk. The shape and character of the buttresses are constant for any given kind of tree, but the size may vary. On the whole buttressed trees are commoner in wet than in dry soils, but the exact use of the buttress is still obscure.

Owing to the dense canopy the only plants in the forest are those which can grow in deep shade and those which are able to reach the top and the light. Lianes are abundant, hanging on branches or twining around trunks, their leafy and flowering parts lost among the tree crowns. These lianes may have stems over 4 inches in diameter. Many plants perch on the upper trunks or branches; these epiphytes include mosses, ferns, orchids, aroids, begonias, balsams (*Impatiens*), and other flowering plants. Certain kinds of figs (the so-called 'stranglers') start life as epiphytes in the crown of a tree, but send out roots which envelop the trunk and finally reach the ground. As these grow the enclosed tree is unable to increase in size and is eventually killed, the strangler taking its place and forming an independent tree of considerable size. Apart from stem epiphytes there are also numerous small plants (liverworts and lichens) which grow on the persistent leaves, and often cover the upper surfaces with a continuous thin layer. Various sorts of African mistletoes grow as parasites on the trees.

Undergrowth in the typical forest is not usually very dense, and it is comparatively easy to traverse the forest by stooping and twisting between the trunks and lianes. It is not usually possible, however, to see any great distance. There are very few herbaceous plants on the forest floor, which is generally covered with leaves and other plant remains.

A striking feature of the forest is the great diversity of the trees of which it is formed. Unlike forests in Europe, which are often composed of but one or two species of tree, the Congo forest consists usually of so intimate a mixture of many species that it is often difficult to find two of the same sort. Pure stands of a single kind of tree are uncommon, although the numbers to be met with of this and that species change from place to place according to the soil and other

factors. Also, in so large a forest area (750 miles from east to west and nearly 500 miles from north to south), there is, naturally, a gradual change of composition.

From such a mixture, embracing probably hundreds of different kinds, it is impossible to do more than select a few of the commonest which possess some striking feature, such as size, economic importance, or the like. Most trees have no English or even widespread native names. A short list of specially interesting or important trees follows:

Native names	*English or French name*	*Botanical name*	*Height (average)*	*Economic product, &c.*
Kamba, Kambala, Bolundu, or Mbara	African Oak	*Chlorophora excelsa*	180 ft.	Teak-like timber
	Silk-cotton Tree or Faux-cotonnier	*Ceiba pentandra*	120 ft.	Kapok
	..	*Piptadenia africana*	to 180 ft.	Timber
	Wild Nutmeg	*Pycnanthus Kombo*	140 ft.	Secondary forest
Libamba or Camba	Flat-crown Tree	*Albizzia gummifera*	..	Good timber
Tsongati	Pattern-wood Tree	*Alstonia congoensis*	120 ft.	Good timber
Mbidi	Incense Tree or Elémier d'Afrique	*Canarium Schweinfurthii*	..	Resin and nuts
Mbaka or Kongo	Copal Tree or Copalier	*Copaifera Demeusei*	..	Copal gum
	African Walnut	*Coula edulis*	130 ft.	Nuts and timber
Beira	..	*Cynometra Alexandri*	..	Copal and hard timber
	African Mahogany	*Entandophragma, Khaya*	Over 100 ft.	Timber
	Ordeal Tree	*Erythrophloeum guineense*	150 ft.	Resistant timber
Limbali or Mbalu	..	*Macrolobium Dewevrei*	100 ft.	Oak-like timber
Vuku	African Linden	*Mitragyna stipulosa*	100 ft.	Timber for canoes and building
Bolungu	..	*Symphonia gabonensis*	..	Resistant timber
Limba or Ngotto	Congo Walnut	*Terminalia superba*	160 ft.	Timber
Bossenghe	Red Cedar or Sugar Plum	*Uapaca guineensis*	90 ft.	Timber
	Umbrella Tree or Parasolier	*Musanga Smithii*	..	Secondary forest
	African Wood-oil-nut Tree	*Ricinodendron africanum*	130 ft.	Secondary forest
	Oil Palm or Palmier à l'Huile	*Elaeis guineensis*	to 100 ft.	Oil
	African Tulip, Flame Tree, or Tulipier	*Spathodea campanulata*	130 ft.	Soft timber
Ekelle	..	*Klainedoxa longifolia*	130 ft.	Hard timber
	Oil-bean Tree	*Pentaclethra macrophylla*	100 ft.	Timber and oil

When one of the giants of the forest is destroyed in a storm, or dies of old age, an opening is left which is rapidly filled. A continuous replacement of the forest gradually takes place, whilst the white ant (termite) acts as a slow but persistent scavenger of dead wood. The first to appear are tall herbaceous plants, particularly of the Ginger family, forming dense masses in any open spot. These are followed by tree seedlings of the rapidly growing sort, and later by slower growing types until the original canopy is restored. During this restoration a dense jumble of plants—herbs, shrubs, young trees, and lianes—struggle to get to the light.

Although many of the above statements apply to the whole of the Congo lowland rain-forest, the picture they give applies particularly to areas in which ground is relatively dry and firm throughout the year. Much the greater part of the half of the rain-forest east of longitude 24° E., as well as the higher ground in the western half, is of this sort. Within parts of this dry-ground forest there are two tree species which form almost pure stands of considerable extent. These are two members of the Pea family, the limbali and *Cynometra Alexandri*, both mentioned in the list above. Extensive forests of limbali grow in the outer parts of the main forest, particularly towards the north and east in the valleys of the rivers Mongala, Itimbiri, Aruwimi, lower Ituri, and around Stanleyville. It prefers light, deep, sandy soils. *Cynometra* forest, on the other hand, occupies the basin of the upper Ituri and forms the tongue of forest connecting with the Uganda forests. In both these types, especially in the limbali forest, the dense shade of the main canopy reduces the lower tree-layers, while lianes are less common than in the normal mixed dry forest.

The Mayumbe forest, on the high ground to the north of Boma, agrees in general with the dry-ground forest of the central basin (Plate 17). In specific composition, however, it is closely related to the neighbouring forests of Moyen Congo, many species common in Mayumbe being comparatively rare in the rest of the Congo. The most important trees are kamba (*Chlorophora*), limba (*Terminalia*), minzu (*Combretodendron africanum*), and ngulu maza (*Sarcocephalus Diderrichii*), but there is the usual mixture of species characteristic of the Congo lowland forest, and tree ferns over 12 feet high are a striking feature.

In the half of the Congo basin west of longitude 24° E. part of the great volume of water brought down by the numerous rivers is dammed up behind the mountains through which the Congo escapes, for this is the sump of the old inland sea. In the lower parts of the



17. *Primeval forest in Mayumbe*



18. *Riverain forest of* Copaifera Demeusei



19. *Savanna with* Hymenocardia acida, *near Kimuenza, Lower Congo*



20. *Baobab and Oil palms in the savanna near Boma*

valleys there are widespread floods during the period of heaviest rainfall, and in many areas, particularly along the lower Ubangi and the Congo around Coquilhatville and Nouvelle Anvers, the flood water never drains away entirely and causes permanent swamps. According to whether the flooding is temporary or permanent, we find corresponding modifications of the tropical forest. These are known, respectively, as Riverain or Flooded Forest and Swampy Forest. Naturally the two types have much in common, but whereas the former can be traversed easily when the water has subsided, the latter usually presents more difficulty.

Riverain or Flooded Forest. This follows the lower courses of most of the rivers, forming a strip of varying width depending on the nature of the banks and the width of the whole valley. In some districts flooded areas are very extensive. After the water subsides the soil dries and is relatively firm. The tree canopy is formed especially of various species yielding copal gum, particularly *Copaifera Demeusei* (Plate 18) and *Cynometra Gilletii*, also of silk-cotton trees and bossenghe (*Uapaca guineensis*). Many other tree species are characteristic of this type of forest, most of them with buttresses or stilt roots. The canopy is not very thick, but nevertheless there is no marked lower tree- or shrub-layer. Lianes are large and abundant. Climbing spiny rattan palms (*Calamus* and *Eremospatha*) may combine with the other lianes and with stilt roots to form an impenetrable mass. There are few herbs except members of the Ginger family, which form dense thickets locally, and certain bulbous plants. Along the river-banks there is often a fringe of raphia palms (*Raphia Sese* and *R. Laurentii*).

Swampy Forest. This type is especially common between the lower courses of the Ubangi and Congo and in the region around Coquilhatville and east of Lake Leopold II. The soil is always soft and spongy. The main tree canopy is dense, but there are also well-developed lower layers and matted undergrowth. Many of the trees are the same as in the flooded forest, especially copal trees and *Uapaca*. These and vuku (*Mitragyna stipulosa*) sometimes form almost pure stands. Most of the trees have well-developed buttresses, stilt roots, flanges, and the like. Large lianes, especially types with much flattened and ribbon-like stems which may be twisted into all sorts of fantastic shapes, are extremely abundant. Lianes, rattan palms, buttresses, and stilt roots form a dense thicket. The herbaceous ground vegetation, rich in species, is continuous only where the woody plants are open enough.

Secondary Forest. Much of the forest is not, however, in its virgin state, but has been altered, in varying extent, by man. Alteration may only mean the removal of specially valuable trees, but may, at the other extreme, imply an almost complete clearance in order to grow food crops. In the latter case all the smaller trees and undergrowth are felled and burnt, and only the very large trees, or those with very hard timber, left as not worth the trouble of removal. Trees yielding valuable products may also be left.

In spite of the luxuriant growth of the forest it does not follow that the soil is fertile for agriculture. A tree will find water and food in the subsoil where crops cannot, but evidence shows that such richness as the topsoil possesses is due mainly to the forest and not vice versa. Once the forest is removed the plant food in the soil is soon lost. The natives, therefore, usually take two, three, or perhaps four crops from the land and then abandon the clearings, repeating the process elsewhere. This is the method of shifting cultivation, the same forest area being used again only after the lapse of from thirty to fifty years. Where, however, several successive crops are grown the soil may become exhausted and unsuitable for the re-establishment of forest. Other plant communities, giant grasses for example, then occupy the ground, which ceases to belong to the forest.

If the cultivated fields are abandoned while the soil is still suitable, forest is gradually re-established. The first stage is the invasion of the fields by annual herbs, these being followed by perennial herbs and low shrubs. Regrowth also usually takes place from the bases of some of the felled trees. By the time a thick cover has been established seedlings of trees have appeared, and these grow up and form a forest canopy. These first trees are all quick-growing soft-wooded species such as the umbrella tree, *Trema guineensis*, *Harungana madagascariensis*, wild nutmeg, *Sterculia tragacantha*, and *Ricinodendron africanum*. Gradually seedlings of the harder, slower-growing, species appear, and slowly the forest recovers much of its original character.

Because of the widespread ravages of man very large areas are covered with secondary forest in different stages of development. In Mayumbe, for instance, only a quarter of the forest area is thought to be primary. Generally, secondary forest is much denser, with numerous small trees and considerable undergrowth, especially of tall herbs and shrubs. Oil palms (*Elaeis guineensis*), which are sown purposely by the natives or spread by parrots or monkeys, but which cannot

grow in the deep shade of the virgin forest, are almost certain evidence that the forest is secondary.

Except on its fringes, where, especially in the south, alternating patches of forest and of savanna occur, the forest extends unbroken except for the rivers, the small patches of cultivation around native villages or near centres of white colonization, and a few very limited areas of grassland. Along many rivers the forest reaches to the water's edge and forms a green impenetrable wall. It covers even the numerous islands, but there are often narrow strips of herbaceous vegetation, and perhaps shrubs, along the banks. In places these strips widen into extensive marshes or cover or encircle islands. These marsh communities are composed mainly of grasses (*Vossia cuspidata* and *Echinochloa stagnina*), although in some places, as for instance near the mouth of the river Itimbiri, east of Bumba, the papyrus (*Cyperus papyrus*) may be the dominant plant. Most of these species can root in water and form floating masses which rise and fall with the floods. The species vary in different localities according to the depth and current, but most of them are widely distributed in the sudd or floating swamp areas of tropical Africa.

The Coquilhatville district is peculiarly rich in small grassy clearings, known as 'esobe', which occur in the forest near the rivers and are developed on sandbanks, the soil of which is not yet suitable to bear forest. In other regions, especially in the north, a hard impervious layer of laterite soil near the surface of the ground prevents the establishment of almost all woody growth. In such cases short grassy turf, with shrubs growing in small pockets in the laterite, forms clearings of limited size.

Savanna Zone (Plates 19, 20, and 21)

The savanna of this zone is grassland with a small admixture of woody plants. There may, however, be all the stages from practically pure grassland, with woody plants few and far between, to open woodland with dense grass-cover between the trees. This leads on to the dry savanna-woodland (*savane-boisée* of French authors) so characteristic of the Katanga region.

The savanna forms an immense, nearly closed, ring round the central rain-forest and occupies the outer slopes of the great Congo basin from Boma and Leopoldville south and east to near Albertville, and in the north along the upper Ubangi, Uele, and Bomu rivers.

The savanna zone, however, is not entirely grassland or composed of herbaceous communities. It also includes patches of forest, which

are to be found mainly in the area immediately surrounding the rain-forest region. Fringing forests extend into it along the river-banks. Generally speaking, the true savannas occupy the plateaux between watercourses, but they may also border rivers. As one passes from the centre of the Congo basin towards the outskirts of the colony the proportion of forest tends to decrease steadily until it is almost entirely replaced by savanna.

As already stated, the savannas predominate in areas with a marked dry season of from three to six months. In this period the herbaceous vegetation becomes quite dry and dead, while the trees tend to lose their leaves, at least for part of the dry season. Consequently the savannas become parched, brown, and desolate and are usually swept by fires which may be accidental but are more frequently started by the natives for varying purposes connected with their social organization. These regular fires are not only an important factor in the maintenance of savanna against possible encroachment by the forest, but also help to determine many of the features of the savanna plants themselves.

It is evident that the power to resist prolonged drought successfully is a *sine qua non* for savanna vegetation, but this resistance is effected in different ways by the various types of plants. The herbs usually die down to the ground and store food in their underground parts, which may be bulbous or tuberous. Good examples are orchids, gladiolus, and various members of the Lily and Daffodil families. The woody plants, in addition to shedding their leaves, often get protection from a thick corky bark.

The dominant grasses, which differ in species according to the area, occur mostly in the form of large tussocks, usually with bare patches of ground between, particularly in the dry season. With the first rains these grasses awaken into activity and eventually form a thick matted growth of from 3 to 15 feet in height, depending on the soil and the species. Between them are smaller grasses and other herbs. The woody plants are usually rather stunted, with twisted or knotted trunks and branches and often flat or umbrella-like crowns. They may occur singly at varying intervals, but are more frequently grouped in small clumps, separated by considerable stretches of open grassland.

The savannas may be classified according to differences in the dominant grasses or according to the degree and thickness of the tree cover. The former method seems more logical since the climate is more suitable for grass than for trees. Three main types of savanna can be recognized, depending on the height of the grasses in the rainy

season, but it must be remembered that owing to variations in soil, drainage, and man's activities, transitions frequently occur between the types.

Short-grass Savanna (or 'Steppe' of some Belgian writers). Here the grasses are relatively low, reaching a height of 3 or 4 feet at most, with narrow hard leaves. They grow on rather poor, dry, sandy, stony or gravelly soils, mostly on the plateaux between the watercourses in Bas-Congo, Kasai, and eastwards nearly to the river Lualaba. The grass cover never becomes continuous, whilst the frequent spaces between the tufts make passage easy at all seasons. Visibility is good over long distances. The chief grasses are *Aristida Dewildemanii*, red top grass (*Rhynchelytrum roseum* and *R. amethysteum*), spear grass (*Heteropogon contortus*), and species of *Sporobolus* and *Eragrostis*. These short-grass savannas may be almost entirely devoid of trees over large areas, but are also frequently more or less wooded with a mixture of small trees and shrubs of which *Hymenocardia acida* is the commonest species (Plate 19). Other species of tree are *Annona senegalensis*, which bears a yellow edible fruit about 2 inches long, and the negro peach (*Sarcocephalus sambucinus*).

Short-grass savannas frequently occur on lateritic soils where the hardened ironstone layer below the surface prevents satisfactory rooting by larger grasses. The bracken fern (*Pteridium aquilinum*) sometimes forms dense brakes on the dry sandy soils of areas which have gone out of cultivation.

Medium-grass Savanna. This type probably covers the greatest area both to the north and south of the forest zone. The grasses when mature are 5 to 7 feet in height, and the tussocks, though separate, interlace so completely as to make penetration difficult except along native paths or game tracks. Visibility also is very limited. This type grows usually in soil of medium fertility and dampness which often possesses considerable amounts of organic material. The grasses grow profusely and vary considerably from place to place, but generally consist of members of the important *Andropogon* group, namely species of *Andropogon*, *Hyparrhenia* (especially *H. diplandra*), *Cymbopogon* (lemon grasses), *Sorghum* (wild millets), and *Heteropogon* (spear grass), as well as others. Between them are to be found other herbaceous plants, often with woody bases, as well as the rubber-yielding climbers *Landolphia humilis* and *L. Thollonii*.

In the medium-grass savanna there is normally some admixture of woody plants. These vary not only in actual numbers from place to place but also in kind as one travels from west to east. The species

in the west are usually distributed throughout west African savannas, whereas those in the east are types common in the Sudan or Tanganyika Territory. In the savannas around Boma and Matadi the baobab (*Adansonia digitata*) is a familiar sight (Plate 20), its large swollen trunk being as much as 10 feet or more in diameter. Farther east the common *Hymenocardia acida* is often the chief woody plant, mainly on account of its great powers of resistance to the annual grass fires. In the north (Ubangi region) the copaiba balsam (*Daniellia Oliveri*) forms a sort of tree savanna, while to the east (basins of the Uele and Bomu rivers) the meni-oil tree (*Lophira alata*) is prominent. This again is replaced farther east by a sort of coral flower or 'Arbre corail' (*Erythrina abyssinica*) and by the beautiful flowering shrubby *Protea madiensis*, both of which are the commonest plants over large stretches of country. With most of these changing dominants are found other small trees or shrubs of 12 to 30 feet high, forming a sort of open bush, the interstices of which are filled by the all-pervading savanna grasses. In flat areas by the rivers Congo, Kasai, Ubangi, Lualaba, &c., clumps of fan-palm (*Borassus aethiopium*) or more rarely (e.g. near Matadi) of dum-palm (*Hyphaene*) are highly characteristic.

A special form of this medium-height savanna is that dominated by lalang or alang-alang (*Imperata cylindrica*). This is a perennial grass, 4 to 7 feet in height, which spreads rapidly from underground runners and forms a continuous and almost impenetrable growth. It is especially characteristic of abandoned cultivated fields, which may originally have been savanna or parts of the forest. Fields which have been cropped for a number of years and then abandoned are invaded by lalang, which, at least on the outskirts of the forest, is swept by the regular grass-fires and may persist for a considerable time. These districts therefore become part of the adjacent savanna. A large area of lalang savanna occurs in the region between Libenge and Banzyville south of the Ubangi river, while another one exists farther east between the Uele and Bomokandi rivers.

Tall-grass Savanna (sometimes termed 'Madiadia'). This is generally found only on relatively rich soils—either alluvial silts in the bottoms of valleys or on flooded plains, or highly organic soils at the forest margins. The chief constituent is the elephant grass (*Pennisetum purpureum*)—a giant grass reaching a height of 12 to 16 feet when fully grown. It forms a dense thicket only passable by paths or after very laborious cutting. Very few other herbs occur with elephant grass, but woody plants may be found occasionally.

In badly drained valleys swamp vegetation may spread. Papyrus or



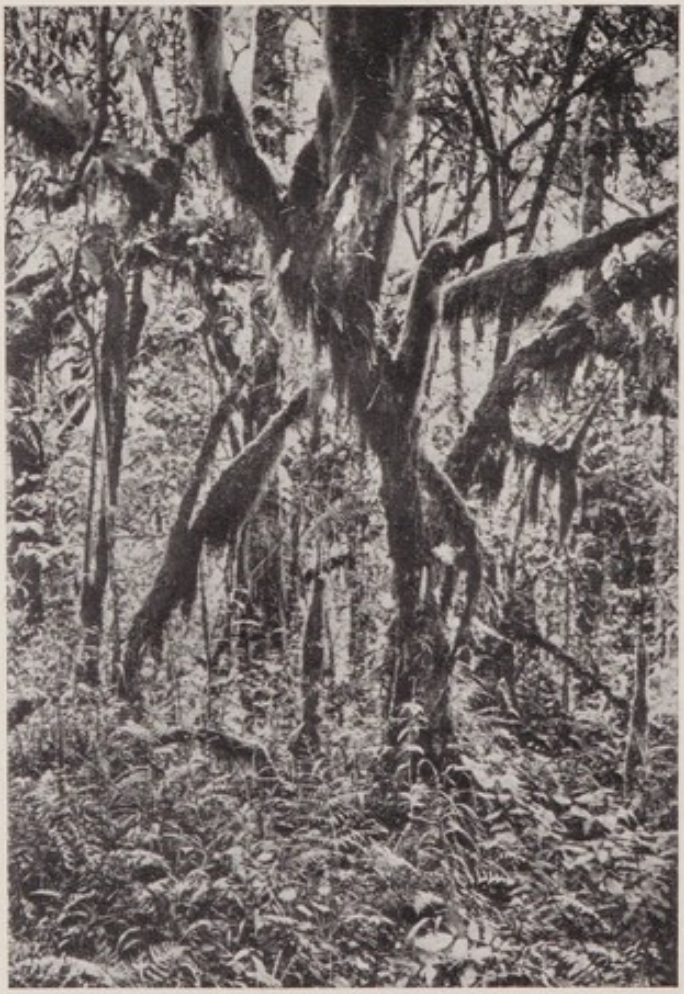
21. *Fringing forest of* Phoenix reclinata, *along River Rutshuru*



22. *Rift valley north of Lake Edward. Grass steppe of* Themeda triandra *in foreground. Gallery-bush in ravine in centre, steppe with 'parasol' accacias on each side*



23. *Rift valley south of Lake Edward. Steppe with candelabra-Euphorbias. Virunga mountain in the distance*



24. *Mountain forest on old lava. Dense masses of lichens* (Usnea) *on branches and numerous ferns on ground*

common reed (*Phragmites*) may be the dominant plant. Here also is found the ambatch (*Herminiera elaphroxylon*), a characteristic member of the sudd or floating swamp.

Fringing Forests are typically developed along the middle courses of rivers. They occur normally on the steep slopes of narrow river valleys, rather than on the flat valley bottoms which are frequently covered with savannas of the more luxuriant types. Upstream the forest fringes narrow gradually until they are finally reduced to a single line of trees and then disappear completely. Patches of forest are found at the sources of streams, which are often marshy. Fringing forests which stretch along the rivers, far beyond the central forest area, may give to the traveller by water the impression of a forest-clad country when actually savanna is the rule.

As fringing forests occur in climates which are not truly favourable to forest formation, they tend to be less well developed than the true rain-forest. The trees are usually smaller and more stunted, the vegetation is poorer in species, and special types of plants such as lianes and epiphytes are much less abundant. In addition, they are frequently interfered with by the natives and consequently contain many trees characteristic of secondary forest. Nevertheless, where local conditions are especially favourable, these fringing forests may closely resemble typical forests of the central area.

Eastern Mountains

(Plates 22 and 23)

In a mountainous region the dominating factors are bound to be topographical. Of these altitude, with its double effect on temperature and rainfall, is particularly important. The region may be divided into two main divisions, namely the bottom of the Rift valley itself, and the ranges of mountains on each side; to the latter may be added the high plateau of eastern Ruanda-Urundi.

The Rift Valley Bottom

That portion of the Rift valley bottom which interests us extends from the north end of Lake Albert along the valleys of the Semliki, Rutshuru, and Ruzizi rivers to the north end of Lake Tanganyika. It is broken into several more or less isolated parts by Lakes Edward and Kivu and by the high volcanic ground west of the Virunga mountains. The name generally used for this block of volcanic mountains is the Mfumbiro, which in the vernacular means 'the cooker'. In the Semliki valley, west and north-west of Ruwenzori, is the tongue

of tropical lowland rain forest already referred to, while west of the Virunga mountains the extensive lava deposits support a special vegetation; otherwise dry savanna or steppe vegetation is the prevailing type. This is because of the relatively low altitude, the accompanying low rainfall, and the frequency of hot drying föhn winds.

Steppe. This shows very considerable agreement throughout, although there is variation from place to place. It occupies the flat terraces forming the bottom of the valley. On the whole the soil is dry and the grass cover relatively short and open. The chief grasses are species of *Hyparrhenia*, spear grass, *Themeda triandra*, *Chloris Gayana*, and species of *Sporobolus*, *Aristida*, and *Eragrostis*. In some places other herbs are few, but in others there are many flowering plants belonging especially to the Pea family (species of *Crotalaria*, *Indigofera*, and *Tephrosia*). There are many plants with succulent leaves or cactus-like stems natural to a dry climate. These include aloes, with fleshy saw-edged leaves, *Asparagus*, *Sansevieria* with solid awl-shaped leaves, and species of *Cissus* with fleshy leaves and large swollen underground stems.

The steppe is often devoid of trees or shrubs, but, here and there, woody plants of different types occur either singly or in small groups. Several kinds of acacia are especially characteristic, namely *A. hebecladoides*, a small tree about 20 feet high with a flat umbrella crown (Plate 22) and *A. Seyal*, a shrub 6–10 feet high. Very curious cactus-like euphorbia trees, branching like candelabra (Plate 23), are also common locally except in most of the upper Semliki valley; with these are usually other trees and shrubs. Here and there the fan-palm is the only tree present. On the smaller hills the woody growth may be thicker, with a greater variety of trees and shrubs.

Streamside and Damp Ground Vegetation. Along the main rivers there are either narrow fringing forests in which the dominant tree is the wild spiny date (*Phoenix reclinata*; Plate 21), or else marshes covered by tall grasses such as elephant grass or common reed (*Phragmites communis*). Fringing forests also occur on the heavier water-retaining soils. The fan-palm is especially common in the flatter areas near the rivers. Lalang is dominant where there has been cultivation. A dense woody vegetation called 'gallery-bush' sometimes develops in ravines along the smaller tributary streams (Plate 22). Tree euphorbias and other small trees and shrubs, many of them spiny, form the upper vegetation which is matted with small climbing plants and is often almost impenetrable.

Lava Plains. In the Rift valley south-west and west of the active

Virunga volcanoes, Nyamlagira and Nyiragongo, and southwards to Lake Kivu, the ground is almost entirely made up of lava flows of various ages, some as recent as 1912. These lavas show all stages from an almost bare surface to a well-developed forest of a rather dry type. The lava surface may be almost smooth or may consist of a jumble of very irregular blocks. On the whole the block type becomes colonized more readily than the smooth, on account of the protection offered by the numerous crevices and occasional small caverns. Mosses and other lower plants are the first to grow, followed by grasses, other herbs, and small shrubs. Woody plants, particularly a species of dock (*Rumex maderensis*), then gradually appear, and grow up to form, first scrub, and then a drought-enduring 'maquis' type of forest with hard shining leaves. The scrub is most completely developed on the block lava, whereas on the smooth lava open savanna with clumps of dense scrub tends to be the rule. The chief forest trees are *Myrica salicifolia* and an olive (*Olea chrysophylla*); common shrubs are *Agauria salicifolia*, *Faurea saligna*, *Rhus natalensis*, and the spiny *Carissa edulis*, while jasmines (*Jasminum dichotomum* and others) climb among the woody plants.

The Mountain Ranges (Plates 24, 25, and 26)

From the low ground on either side of the mountains the rainfall gradually increases upwards until a maximum is reached at about 7,500 to 8,000 feet, above which the rainfall decreases in quantity but is finer, and more continuous, than the heavy tropical showers of the lower altitudes. Rainfall and altitude determine the vegetation. The lower slopes are steppe or savanna and become increasingly wooded as they rise. Forest is found within or near to the region of maximum rainfall. Above, the vegetation changes to the sub-alpine and alpine. These various zones may show considerable modification from one mountain group to another, not only in actual composition, but also in the height at which they occur. As a general rule the more extensive and the higher a massif is, the greater the altitude at which any given vegetation zone is found. On isolated mountains all the zones may occur at levels well below the average. The mountain vegetation will be considered under the following heads: (*a*) Lower Slopes, (*b*) Mountain Forest, (*c*) Sub-alpine Zone, (*d*) Alpine Zone.

Lower Slopes. These may be divided for convenience into three main areas, namely, the slopes west of the western mountain range, the slopes on either side of the Rift valley, and the greater part of Ruanda-Urundi. These three areas become increasingly dry from

west to east and the vegetation varies accordingly. Many of the slopes are thickly populated, or have been in historic times; consequently the vegetation has been greatly changed and it is difficult to say how much, if any, is in its original state.

The lower parts of the western slopes of the mountain areas, say from 4,000 to 5,500 feet, are covered by forest which, although similar in many respects to the lowland forest of the Congo basin, shows many transitions towards the mountain forest of higher altitudes with which it was originally in contact and into which it probably passed gradually. These intermediate characters show not only in composition, the trees being a mixture of elements from the lowland and mountain forests, but also in nature. On the whole the trees are considerably smaller and closer together than in the lowland forest, while the undergrowth and herbaceous vegetation are denser. Tree ferns are common in the deep valleys or ravines.

The upper parts of this zone, as well as the lower parts of the zone above, have been largely cultivated or otherwise altered by man. As a result a belt of grass savanna and scrub patches has sprung up between the two types of forest, which are rarely in contact. Two important constituents of these secondary communities are elephant grass, forming dense stands up to 15 feet high on clayey soils, and bracken fern, which occurs in continuous brakes on the drier sandy soils. In the valleys, and on the steeper, less accessible slopes, belts of forest frequently remain.

In the extreme north, just south of the Uganda border, and in the south between Uvira and Albertville, the western slopes are almost completely savanna-covered. These northern savannas, which may extend up to 6,500 feet, consist of short grasses usually not more than 3 or 4 feet in height. *Themeda triandra*, a grass of the large *Andropogon* group, is common and sometimes almost pure. Trees and shrubs occur at intervals, especially in shallow valleys or depressions. The savannas in the southern portion contain some types of plant characteristic of the plateaux of Katanga, species of *Brachystegia* for instance.

The lower slopes on either side of the Rift valley are dried by föhn winds and support a savanna or steppe vegetation very similar to that of the valley floor, alternating with forest patches in the gullies and damper places. Many districts are very rocky, with sparse vegetation. Numerous weeds follow native cultivation and a very mixed vegetation results. At higher altitudes with increasing rainfall the savannas are similar to those on the western slopes.

The plateau forming the eastern part of Ruanda-Urundi is covered by savannas or steppes with shrubs and occasional trees, very similar in general type to those of the Rift valley bottom. Owing to the dense human population much of the vegetation has been greatly altered. Acacia steppes with candelabra-type tree euphorbias are found in the east, while farther west are richer steppes with numerous flowering herbs among the grasses. Dense bush of shrubs, often thorny, including *Acanthus arboreus*, *Carissa edulis*, *Toddalia aculeata*, and *Clausena anisata*, is found on the steeper slopes. Near the Kagera river the woody growth becomes more prominent.

In all three areas, where the lower valleys are marshy, they are usually filled with papyrus swamps, which are of great extent round the numerous lakes in the north-east of Ruanda-Urundi.

Mountain Forest. This important forest type occupies considerable stretches of the upper slopes of the mountains, between 5,500 and 8,700 feet, from Lake Albert in the north to Lake Tanganyika in the south. The most important areas are on the Ruwenzori massif, parts of the western mountain range east of lakes Edward and Kivu, the Virunga mountains, and those of Ruanda-Urundi. The forest occurs between 7,000 and 8,000 feet, in the zone of maximum precipitation. The rainfall is distributed fairly evenly throughout the year but two relatively dry periods coincide with the solstices. The total annual rainfall varies from 50 inches at 5,500 feet to 100 inches at 8,000 feet. In the upper regions especially humidity is always high, and, owing to cloud, the insolation is at a minimum.

The forest usually occurs on steep and often rocky slopes, probably because it has been destroyed on the more gentle and easily cultivated ones. The soil is often volcanic and homogeneous to considerable depths.

In most regions two distinct types may be recognized, namely, a lower, wide, evergreen mixed forest zone of broad-leaved trees from 5,500 to 7,500 or 8,000 feet and a narrower bamboo forest zone from 8,000 feet to the upper forest limit. In places the lower forest type may be quite absent or the broad-leaved trees and bamboos may be much mixed in the upper forest zones.

(*a*) *Evergreen Mixed Forest.* This agrees with the lowland rain forest in being mostly evergreen in character, but some deciduous trees are found in the lowest zones where the rainfall is least. Many of the trees lose a proportion of their leaves in the short dry season, but this is purely an individual matter and never results in defoliation of the forest as a whole. The trees form two recognizable layers, one of

the dominant species, and the other a subsidiary layer of smaller trees. The main canopy is usually at about 70 feet with a maximum of 85 feet, but is often much lower at high altitudes. The forest is relatively poor in species compared with the lowland forest but, like it, is thoroughly mixed, and no one species ever constitutes more than 20 per cent. of the total stand. The tree crowns are usually distinct and do not form a very dense canopy, while winged trunks or buttresses are quite uncommon. Lianes are not rare, but they never reach any great size and flattened ribbon types are absent. A striking feature is the great abundance of epiphytes (Plate 24). These include numerous mosses and lichens, ferns and such flowering plants as orchids, begonias, and balsams (*Impatiens*). Parasitic mistletoes abound. The epiphytes increase with altitude, rainfall, and humidity, reaching their maximum in the uppermost zone. The undergrowth is dense, consisting usually of two layers, composed of large and small shrubs respectively, with which are associated young trees of the upper layer. The herbaceous vegetation, on the other hand, is not continuous and is only abundant in clearings.

In many places three altitudinal zones may be recognized: lower zone, 5,500 to 6,300 feet; intermediate zone, 6,300 to 7,000 feet; upper zone, 7,000 to 8,000 feet. Of these the two lower zones show the most luxuriant growth, with high straight trunks and dense undergrowth, including numerous tree ferns and wild bananas (*Musa ensete*). In the upper zone there is a much lower canopy (35 to 50 ft.); the trunks are knotted and twisted, while epiphytes, especially lichens and mosses, are extremely abundant. Bamboos (*Arundinaria alpina*) occur in groups in this zone. Each altitudinal zone has its characteristic species both among the trees and the smaller plants.

The following is a selection of the most important trees, the greater number of which are 70 to 80 feet in height and reach 100 feet or more in favourable localities; in many the trunks are 3 to 5 feet in diameter.

English or native name	*Botanical name*	*Economic products, &c.*
East African Yellow-wood	*Podocarpus milanjianus, P. usambarensis*	Yellow deal-like timber over 130 ft. high
Crabwood, Mukwete or Muheti	*Carapa grandiflora*	Mahogany-like timber, toilet oil
	Ekebergia Rueppeliana	..
Ikambi	*Entandophragma speciosum*	..
Kikenzi	*Ficalhoa laurifolia*	Good timber
Bushaie	*Lebrunia Bushaie*	Toilet oil
	Ocotea usambarensis	Hard timber

English or native name	*Botanical name*	*Economic products, &c.*
East African Olive	*Olea Hochstetteri*	..
	Parinari Mildbraedii	Basal buttresses 6–7 ft. high
Munge or Ndongi	*Polyscias fulva*	Durable timber Basal buttresses 8 ft. high
	Sideroxylon Adolfi-Friederici	Timber
Musika or Muhika	*Strombosia grandiflora*	Hard timber
Musimba or Muzizi	*Symphonia gabonensis* var. *macrantha*	..

When, as often occurs, it is disturbed, the primary evergreen mixed forest gives place to the secondary which, if the disturbance is not continued, tends to revert again to primary. The natives often abandon cultivation after a short time, and such areas revert to forest in much the same manner as described for the lowland forest, passing through stages in which annual herbs, perennial herbs, shrubs, quick-growing trees, and finally the true forest trees are, respectively, the dominant forms of growth. The early appearing trees include muzeti (*Hagenia anthelmintica*), mushayo-shayo (*Harungana madagascariensis*), flame tree (*Spathodea campanulata*), and *Trema guineensis*.

When destruction radically affects soil fertility, the forest cannot re-establish itself and is replaced by bracken fern or savannas, either grassy or with shrubs, and leading sometimes to dense bush. On the Virunga mountains there is little of the broad-leaved forest left, while on the mountains on both sides of the Rift valley much of the mountain forest zone is occupied by extensive short grasslands now used as pasturage (Plate 25).

(*b*) *Bamboo Forest.* The common African bamboo occurs in clumps in the upper zones of the broad-leaved forest and may also be found covering large areas at even lower altitudes, as for instance on the mountains west of Lake Albert. Normally, however, it forms a relatively narrow band between 7,500 and 8,700 feet (Plate 26). This band is often quite distinct, both from the forest below and from the sub-alpine region above. In some places, as on Mts. Kahuzi and Karisimbi, the bamboo zone may extend as high as 10,000 feet, while on the active volcano Nyamlagira it is completely absent. The bamboo occurs often in almost pure stands; in other places there is a certain admixture of broad-leaved trees, characteristic of the forest just below, especially *Podocarpus milanjianus* and *Sideroxylon Adolfi-Friederici*. In the lower parts of the bamboo forest the culms are thick

and upright, reaching over 60 feet in height and 6 inches in diameter, but at higher altitudes they are more slender, much branched, and half-supported by one another. There is practically no woody undergrowth, and progress is comparatively easy between the clumps except in the upper zone. A few herbs grow in openings, but often the black humus soil is bare. Towards the upper edge of the forest may be found bushes of tree heaths (*Erica* and *Philippia*), so characteristic of the region immediately above.

Sub-alpine Zone. In this zone, and the alpine zone above it, the increasingly low temperature plays an important role. For instance, in passing from the bottom to the top of the sub-alpine zone the mean annual temperature falls from 48° to 38° F., and this is reflected in the gradual impoverishment of the vegetation. In these zones also, owing to the continual mist, insolation is much reduced and at the same time humidity reaches saturation point. Both zones are developed in their greatest perfection on the Ruwenzori massif, but are present on most other sufficiently high mountains.

The sub-alpine zone, which extends from 8,500 or 9,000 to nearly 13,000 feet, is one of scrub mostly composed of tree or bush heaths (*Erica arborea*, *E. Bequaertii*, and *Philippia Johnstoni*; Plate 27) which may attain a height of 20–30 feet in the lower and more favourable parts. The plants, however, are rather gigantic branched bushes than proper trees, large trunks being on the whole uncommon. At higher altitudes the heaths become smaller and smaller and at the upper limit of the zone are only a few feet high, consisting mostly of species of *Philippia*. With the heaths are other small trees or large shrubs, particularly the yellow-wood, *Hagenia anthelmintica* (up to 11,000 ft.), a woody St. John's Wort (*Hypericum lanceolatum*), and other usually small-leaved species. Smaller shrubs include many kinds of everlasting (*Helichrysum*), ragworts and groundsels (*Senecio*), and *Conyza*. The shrubs, particularly the heaths, have their trunks and branches almost completely draped in lichens (*Usnea*) which hang in innumerable festoons. The ground below the heaths, particularly on Ruwenzori, is covered by a thick sodden carpet or cushion of mosses, sometimes as much as 3 feet deep. Growing among the mosses are small herbs including orchids, balsams, ferns, and members of the Acanthus family, but grasses are practically absent. Tree groundsels, so characteristic of the alpine zone, are scattered in the sub-alpine zone, but are usually of different species (chiefly *Senecio Erici-Rosenii*). In its upper portions the zone merges into the alpine zone above, tree groundsels and giant lobelias appearing in increasing numbers.



25. *Short grassland in upper mountain region at south end of Lake Kivu*



26. *Bamboo forest on Mount Musule, Virunga mountains*



27. *Forest of tree-heaths* (Philippia Johnstoni) *on Mount Mgahinga, Virunga mountains. Sterile shoots of* Senecio *and* Lobelia *in foreground*



28. *Alpine zone, southern slopes of Mount Karisimbi, Virunga mountains. Carpet of* alchemilla *with* senecios (*middle distance*) *and giant* lobelias, *many with elongated flower-spikes*

On the three central mountains of the Virunga group (Karisimbi, Mikeno, and Visoke) the lower part of the heath community, ranging from 9,000 to 10,300 feet, is replaced by a very open forest of *Hagenia anthelmintica*, trees with spreading and twisted branches and trunks as much as 4 to 6 feet in diameter. Beneath the trees are the woody St. John's Wort and a few other shrubs. A profusion of herbaceous plants covers the ground, the most important being members of the Parsley family (Umbelliferae).

Alpine Zone. At altitudes of over 13,000 feet low temperatures and high humidity are more pronounced than in the sub-alpine zone. For instance, the mean annual temperature at 14,000 feet on Ruwenzori is only about 35° F. with a maximum fluctuation of no more than 3 degrees in either direction. This is partly due to mist or cloud, which are so prevalent that weeks may pass without sight of the sun. Under these remarkable conditions a flora peculiar to the mountains of Africa has developed.

The characteristic features are the abundance of tree groundsels (chiefly *Senecio adnivalis* and *S. alticola*) and giant lobelias (*Lobelia Wollastonii* especially). The tree groundsels form low and often dense forests, sometimes reaching 25 to nearly 30 feet in height. The trunk, which is slow growing but may attain a diameter of over 18 inches, branches several times, each branch ending in a tuft of large simple leaves, and, at intervals of several years, in a branched flower-spike, 2 to 3 feet high. Plants in the open tend to be more branched than those in the forest. The denser forest is difficult to penetrate owing to the closeness of the trunks and the irregularity of the ground. On some mountains the forest is more open and there is greater admixture of other woody forms, especially in the lower parts of the alpine zone. These include heaths (*Philippia*) and other plants characteristic of the sub-alpine zone. Under the Senecios grow mosses, lichens, and a few herbs. The tree groundsels and lobelias are usually scattered among the other communities, but at higher altitudes the Senecios become smaller and the forest thins out and disappears.

Dwarf shrubs of species of *Alchemilla*, plants allied to the British Lady's-mantle, are found on gentler slopes with better soil. These form a thick layer, from 18 inches to 2½ feet in height, in which branches are so interlaced as to make walking difficult (Plate 28). Among the Alchemillas are a few grasses closely resembling British types (*Poa*, *Festuca*, *Anthoxanthum*, &c.).

On Ruwenzori the rocky slopes or outcrops are covered by a more or less dense scrub of shrubby everlastings (*Helichrysum*) which may

be 6 feet high; similar but not necessarily identical species occur on the other mountain groups, generally mixed with the Senecios and Alchemillas.

Where the ground is swampy a large sedge (*Carex runssoroensis*) is dominant at higher levels, while bog-moss (*Sphagnum*) may occur on the lower slopes. These marshes are extensive only on the Ruwenzori massif.

At the highest levels (over 14,000 ft. on Ruwenzori) the vegetation is reduced to small herbs, with mosses and lichens. The mountain meadow-grass (*Poa glacialis*) grows up to 17,000 feet. The uppermost parts of the active volcanoes Nyamlagira and Nyiragongo are covered with recent volcanic deposits and the upper vegetation limit is therefore much lower than on other mountains.

KATANGA

(Plate 29).

This fourth region may be divided approximately into two distinct sub-regions corresponding to the topography. The northern half, with its alternating deep valleys and high undulating plateaux, is mostly covered by various forms of grassland, either marshy or dry, whereas the southern part, consisting mainly of plateaux with less variation in altitude, is almost entirely wooded.

The climate, throughout, has marked wet and dry seasons, and consequently the vegetation is distinctly that of the savanna, grasses almost everywhere being an essential part of the plant cover. In the south, in particular, vegetation is closely allied to that of Rhodesia, Nyasaland, and southern Tanganyika Territory. The following types may be recognized, but each shows considerable variation which can only be hinted at here: (*a*) Savanna Woodland (including 'dembos'), (*b*) Grassland, (*c*) Marshes, (*d*) Forests.

Savanna Woodland (Savane boisée *or* forêt claire)

This, in its many forms, covers the greater part of the slightly undulating plateaux, 5,000–6,000 feet high, of southern Katanga and also the flanks of the higher plateaux farther north. Normally it consists of an open forest of comparatively low trees, which, however, may be replaced by a sort of scrubby bush in less favourable positions, especially on the valley slopes. Almost all trees lose their leaves during the dry season and remain leafless for some time. The new foliage, which is produced just before the beginning of the rains, is often delicately tinted red or purplish; the adult leaves are usually leathery and often

compound, with numerous leaflets. Most trees are from 20 to 50 feet high with exceptional individuals, or luxuriant stands, as much as 80 feet in height. The trunks, which may be from 6 to 30 feet apart, are small and often twisted, or frequently branched low down, with spreading, flat-topped or umbrella-like and discontinuous crowns (Plate 29). The dominant trees are nearly all members of the Pea family (Leguminosae), the commonest being species of *Brachystegia* (mputu, mutondo, musamba, miombo), of which there is a great variety. These often form special local communities according to soil and drainage. Other important leguminous constituents are species of *Isoberlinia*, *Swartzia*, *Cryptosepalum*, *Pterocarpus*, and *Acacia*, while members of other families include species of *Combretum*, *Parinari*, *Uapaca*, *Monotes*, and *Diplorrhynchus*.

The open canopy gives free access to light and so allows ample herbaceous growth, consisting mainly of grasses but also including many flowering herbs. These include members of the Pea and Daisy families (Compositae), but the details vary much from place to place. At the beginning of the rains many of the herbaceous plants make rapid growth from bulbs or other underground food-storage organs and provide a very attractive 'spring' flora. In more open places there are small shrubs (e.g. species of *Protea* and *Hymenocardia acida*) which, in the larger openings, form comparatively dense scrub, and this merges into the bush of poor soils.

Large districts are covered by variants of savanna woodland in which the trees are smaller, with more slender trunks, or grow farther apart than in the typical well-developed woodland. The latter variant forms the 'orchard bush' common in many parts of Africa. In all these types the grass and herbaceous cover is naturally greater than in the denser woodland, and they therefore show transition towards the predominant grassland described later.

During the dry season all these woodlands are swept by grass fires which destroy the dried-up aerial parts of the herbs, but seem to do little damage to the woody plants, most of which are well protected by thick or resistant bark.

The savanna woodlands are easily traversed at all seasons, and also usually provide comparatively good visibility.

Dembos. Scattered throughout the savanna woodland are open grassy areas, usually occurring along the upper parts of streams, and locally known as 'dembos' (Plate 30). Here the soil, probably owing to accumulation of silt or through continual seepage from above, is more or less waterlogged during the rainy season. Tree growth is

therefore inhibited and replaced by a grassy glade of varying extent. The grasses here are denser and taller than in the surrounding woodland, sedges (Cyperaceae) are abundant, and there is a rich flora of flowering herbs, many of which are peculiar to such localities. The soil is comparatively rich in organic material.

Termite Hills. The nests of white ants or termites are common and widely distributed in the Belgian Congo. The smaller types, which are variously shaped, are usually devoid of all vegetation. There are, however, large nests like hillocks, which may be nearly 20 feet high and much wider at the base. These are especially common in Katanga, where they are spaced out at more or less regular intervals in the savanna woodlands. They are interesting because they support a peculiar vegetation which both collectively, and individually, is not found elsewhere.

On the whole the vegetation is of an evergreen type consisting of certain trees and shrubs often growing very closely and forming a sort of thicket. These include special kinds of figs, Euphorbia, *Combretum*, *Boscia*, and *Vitex*, and also the small bamboo (*Oxytenanthera abyssinica*), which, while it occurs elsewhere, is especially characteristic of these large termite hills. Among herbaceous plants those with succulent stems or leaves are noteworthy, for instance species of *Aloë*, *Chlorophytum*, and *Sansevieria*. Small lianes, grasses, and other herbs also help to form a thick and matted growth. Termite hills which lack this special vegetation are usually found to have been deserted by the termites. Owing to their evergreen character these small patches stand out as green islands among the leafless woodlands during the dry season.

Copper Outcrops. In southern Katanga the small rounded hills formed by the outcropping of copper-containing rocks are easily distinguishable because they bear a low herbaceous and grass carpet. Evidently the high mineral content of the soil is prejudicial to tree-growth. Towards the edge is a belt of stunted trees which passes gradually into the normal savanna woodland.

Grassland (Savannas or Steppes)

Apart from the 'dembos' already dealt with, the Katanga grasslands fall into two readily distinguishable categories, namely, the lowland variety of the river valleys, and the upland grassland or steppe of the high plateaux of the Mitumba, Kibara, Kundelungu, and Marungu mountains. The last are between Lake Mweru and Lake Tanganyika.

The lowland grasslands or savannas occur mainly along the deep and wide valleys of the Lualaba, Lufira, Luvua, and Luapula rivers, occupying a zone between the central swamps or marshes and the savanna woodland on the higher ground (Plate 31). They also occur along minor valleys, usually with bush on either side. They consist of grasses up to 13 or 14 feet tall, including extensive stretches of elephant grass. Grass fires prevent most woody growth, but individual fire-resistant shrubs (e.g. *Bauhinia Thonningii*, and species of *Terminalia*, *Strychnos*, and *Acacia campylacantha*) are scattered about at intervals. According to the water-supply, drainage, richness of the soil, &c., the savannas vary from place to place, poorer soils bearing an abundance of sedges.

The upland grasslands or steppes are found only at altitudes of 5,000 feet or more, occupying the summits of most of the higher plateaux. Here the soil is generally poor, sandy, and to a great extent lateritized, becoming in consequence impermeable. During the rainy season numerous small lakes are formed, some of which never wholly dry up, but otherwise the ground becomes very dry in the dry season. The vegetation is a low grassland or steppe with very little woody growth except around springs or along valleys. Important grasses are *Hyparrhenia cymbaria* and *H. variabilis* and species of *Panicum*, *Eragrostis*, and *Ctenium*, very few of which exceed 3 feet in height. Dwarf shrubs such as *Philippia* occur, and also numerous herbaceous perennials, especially everlastings.

Marshes

These are particularly characteristic of the centres of the deep valleys, a very extensive marshy tract occurring along the river Lualaba, between Mulongo and Bukama. The most characteristic plant is the papyrus, which forms extensive marshes in the Lualaba and Lufira rivers and by lakes Mweru and Bangweulu. Here the soil is usually flooded, material being deposited by the rivers, and peat built up by plant growth. Floating mats of sudd are frequently found, in which, together with other sedges and grasses, occurs the ambatch. In some places tall grasses constitute the main vegetation, but these marshes still await satisfactory botanical study.

Forests

True forest, as distinct from savanna woodland, covers only limited areas in the Katanga region. It occurs chiefly in the form of fringing forest along the streams, where there is alluvial soil, or in

erosion gorges. These forests, usually quite narrow, may be nearly a quarter of a mile wide in places. The trees are evergreen and may attain a height of 50 to 100 feet. There is often a dense shrubby layer accompanied by numerous lianes. The herbaceous vegetation contains species not found in the surrounding savanna woodland. The small bamboo sometimes forms belts immediately outside the fringing forest.

A much rarer type of forest is that covering limited areas in the Marungu massif just west of Lake Tanganyika. This occurs on Mt. Nzawa at altitudes of over 5,500 feet on fresh moist soil. It consists of tall dense stands with more open canopy than in the lowland forest. The tree-trunks are frequently as much as 3 or 4 feet in diameter, with well-developed buttresses. The undergrowth is shrubby, including tree ferns, lianes, and brambles (*Rubus*). Among the herbaceous vegetation are bracken and columbines (*Aquilegia*). It seems probable that this upland forested area was formerly much more extensive.

CHAPTER V

FAUNA

THE Belgian Congo contains a great block of equatorial forest, fringed with savanna and steppes, merging into woodland, and rimmed on the east by mountains and lakes (Fig. 20, p. 69). Each region has its own fauna and even the lakes vary: Tanganyika has shells and crabs resembling marine species, and jelly-fish. Some of the denizens of the Congo, such as the okapi, are found nowhere else. Others like the red Guereza monkeys, belong to west Africa in general. Several have a wider range but are not found outside tropical Africa. Examples are the gorilla, chimpanzee, giraffe, hippopotamus, wild guinea fowl, puff-adder, mamba, and tsetse-fly. Others, again, originated in tropical Africa but have spread farther afield, for example lemurs and antelopes. A number are related to Asiatic species, for instance the great cats, rhinoceroses, mongooses, horn-bills, weaver-birds, crocodiles, pythons, and cobras. A few have relations in South America, for example the trogons among birds. The Belgian Congo also contains such primitive creatures as the ant-bear, pangolin, and lung-fish.

BEASTS

Apes, Monkeys, and Lemurs

The apes keep to the depths of the forest. It is mainly in a narrow strip of mountain forest between the equator and the north end of Lake Tanganyika that one can find gorillas (Plate 32). There are two kinds of chimpanzee, one on the north-east frontier between the Ubangi and Lake Tanganyika and another in the province of Coquilhatville.

The forest also contains monkeys. The Guereza monkeys use their hands chiefly as hooks so that the thumb has atrophied from disuse. Hence their scientific name of *Colobus* ('mutilated'). Black and white species have long hair and plumed tails and there is a trade in the skins. The reddish species, so common in west Africa, is less common in the Belgian Congo. Guenons are funny little animals whose name means in French a puller of faces. This is the monkey that used to be seen on barrel-organs. Many guenons, including Mona and Diana monkeys and a white-nosed species, are

found throughout the forest and one small species inhabits the slopes of Ruwenzori. Large dark monkeys with glaring white eyelids are known as Mangabeys. Baboons prefer open country and have dog faces and short tails. They are notorious thieves and, being intelligent and wary, are extremely difficult to destroy. Stories of attacks on man are exaggerated. They make threatening demonstrations but seldom attack. The Guinea baboon is widely distributed. A species of baboon is found on the Rutshuru plains and in Uele, the yellow baboon occurs in the region of the Lulua, and the common South African chacma is likely to cross over into Katanga.

Lemurs are nocturnal. The most peculiar Congo species called the Potto is a slow, ungainly, evil-smelling, almost tailless animal. Charming little creatures known as Galagos or bush-babies (Plate 33) have thick, woolly coats, large ears, and long tails.

Bats

The great fruit-bats roost in noisy masses on forest trees by day, wing their way to the feeding-grounds in the twilight, and eat wild fruits. The largest is the hideous hammer-head, with a wing-span of over 3 feet. It is particularly fond of guavas. A common yellow species is eaten by the natives. Epaulette bats get their name from a fold on the shoulder. One of them keeps repeating its short, high-pitched whistle all night.

Other bats eat insects. The largest has a wing-span of 27 inches. The pipistrelle, one of the smallest, preys upon mosquitoes. A bat with big nose-leaves, long slate-grey hair on the body, and yellow wings, frequents grass fires to catch insects and is seen in the day-time oftener than any other bat. The nose-leaves are special tactile organs in the form of rosettes of skin around the nose. The pretty butterfly-bat has dull velvety orange wings with dark veins and a wing-span of 12 inches.

Insect Eaters

Two species of hedgehog are found in Uele. Shrews are common. One west African species which swims like an otter is widespread. Some species of jumping or elephant shrews live in the forest, others in the savannas. Golden moles, remarkable for the iridescent sheen of their fur, have been found near the Sankuru and the Aruwimi. They are exclusively African and throw up long continuous ridges in contrast to the 'hills' of the true moles.



29. *Typical savanna woodland*



30. *Large 'dembo' showing short grassland*



31. *Savanna on lowland plain in Katanga district*



32. *Gorilla*



33. *Bush baby*

Rodents

A species of hare has been discovered in the region of the lower Congo, and East and South African species of hares and rabbits may be looked for towards the frontiers.

Squirrels of the same family as our native red squirrel are numerous. Flying squirrels have membranes between their limbs on either side which enable them to 'plane' from one tree to another. A noise heard at night, like the boom of a gong, is made by a ground squirrel. Dormice with tufted tails are peculiar to Africa and are found in the Belgian Congo. Gerbils are desert mice with rather long hind legs and often long tufted tails. Only three species occur, all within the Uele district. The vast assemblage of the mouse family, containing voles, rats, and mice, provides some large as well as some minute species, including striped grass mice. The giant ground hog or cane rat ('faux agouti') is widely spread and eagerly hunted for food. Common and brush-tailed porcupines occur only in the north-east.

Carnivora

Lions may be expected anywhere in the Congo basin where there is food, and man is not too thickly settled and well armed, or the forest not too dense. A favourite haunt is the plain south of Rutshuru near Lake Kivu. Another type is found in Katanga. Man-eaters are not always old and mangy, and young lions in good condition sometimes take to human flesh. Outbreaks of rinderpest may cut down the game and cause still further attacks on the surviving cattle. Leopards mainly frequent forest, but are found even on the slopes of Ruwenzori. The forest type has shorter legs and is more strongly marked. Leopards are notoriously fond of dogs and goats and often prowl round villages. The cheetah or hunting leopard, which is probably the fleetest four-footed wild animal, occurs in Katanga, but its prowess as a hunter has never been turned to account. The caracal is a species of lynx and has long pencilled ears and keen eyesight. The spotted serval and the golden cat of the Ituri are both wildcats.

The spotted hyena occurs at Faradje. Hyenas are apt to attack sick natives and will take leather goods from camps.

Three species of jackal are known, but another member of the same family, the hunting-dog, blotched black and yellow, is to be expected only in Katanga.

Two species of otter are widely distributed, a badger is found in Ituri and a zorilla or striped weasel may be looked for in Katanga.

The civets are cat-like animals, famous for the perfume which they secrete. Two kinds are found in the Belgian Congo, one of which is confined to Ituri. The genets (Fig. 21) and palm civets are similar to the civets, but of slighter build and are creatures of the forest.



FIG. 21. *Genet*

Mongooses are numerous. Among them may be mentioned the marsh mongoose, with cross-striped back; a white species with black legs found in dense forest, and two Katanga species—the white-tailed ichneumon and the squat little suricate, cross-banded, which goes about in troops.

Sea Cows

The manatee is known only in the lower Congo, below the cataracts.

Elephants and Allied Species

The elephant is widespread in the Belgian Congo, and the depredations of elephants in crops must be seen to be believed. Captured young African elephants have been successfully trained at Api for heavy agricultural work.

The hyrax, a furry animal about the size of a rabbit, without the long ears, is a humble relation of the elephant and rhinoceros. There are two forms—tree-dwellers and rock-dwellers. The former are known as tree bears, and their ear-splitting screams resound through the forest after dusk. The rock-dwellers are the 'conies', of which Scripture says (Proverbs xxx. 26), 'The conies are but a feeble folk,

yet make they their houses in the rocks.' Some of these are found in the north-east corner of the Belgian Congo, and the Cape hyrax or rock rabbit or Dassie of South Africa is to be expected among rocks in Katanga.

Hoofed Mammals

Giraffe and Okapi. The giraffe of the Belgian Congo has large quadrangular spots on the body, full spotting of the legs, well-developed frontal horns, and a large tuft on the tail. It is found only in upper Uele. Its only near relative, the okapi (Plate 34), is about the size of a horse but has a longer neck, and, in the male, frontal horns. Its colour is dark brown and purplish-black with transverse white stripes on the legs, and it frequents only the undulating, drier portion of the rain-forest and a strip between the Ubangi and the Congo of which Buta is about the centre.

Antelopes and Buffaloes. The Belgian Congo has neither the vast plains nor the enormous herds of game of East Africa, but the various animals grouped under the general name of antelope are well represented. The majority graze on the plains round Lakes Albert and Edward or on the northern or southern savannas. A few may be selected. Hartebeests are large antelopes with grotesquely elongated faces and vertical nostrils. The oribi stands about 25 inches high at the shoulder and has bare patches of skin beneath each ear. The height of the magnificent sable antelope is about 4 ft. 6 in. and the horns, which in the male grow up to 44 inches, curve backwards. The roan is about the same size, but has shorter curved horns. Elands are the largest of all the antelopes, adult bulls standing nearly 6 feet at the shoulder. The giant or Lord Derby's eland is an exceptionally massive species. The bush buck or harnessed antelope barks like a dog and is distinguished by white stripes on its sides.

Other antelopes are forest or bush animals. The duikers are the smallest of all antelopes. 'Duiker' in Afrikaans means 'diver', and they have a habit of leaping high out of long grass and then plunging into it head first. Pygmy antelopes stand 13–14 inches high at the shoulder. The bongo is a magnificent bright chestnut-red species, standing up to 48 inches at the shoulders, with a white chevron on its face and white side-stripes.

Certain species are found near water or in swampy places. The water buck is about the size of a pony and has long lyre-shaped horns. Lechwes are rather smaller and kobs are smaller still, with shorter horns. The impala, a South African species, standing about 3 feet

high, with graceful, lyre-shaped horns, is often found grazing with the lechwe. The marsh bucks or situgungas are distinguished by their conspicuously elongated hoofs, by means of which the animals are enabled to walk upon the soft mud of the swamps in which they live.

Buffaloes vary from the large, black buffaloes of the open country to the smaller, red, forest species.

Hippopotamus and Pigs. The hippopotamus is sufficiently plentiful to be capable of doing considerable damage to riverside crops. The wart-hog lives in open country and the giant forest hog in the Ituri forest. Red river-hogs with white mane and white-plumed ears are widely distributed.

Mouse Deer. A number of dwarf deer are known as chevrotains or mouse deer. All are hornless and tusked. The Belgian Congo contains the water chevrotain, rich brown in colour with white spots and stripes.

Rhinoceros. The common or black rhinoceros occurs in Katanga and Ruanda, and the white or square-lipped species of the southern Sudan extends into Uele.

Zebra. Herds of zebra are found grazing in Katanga and Ruanda. They belong to the species known as the Kwagga or Burchill's zebra, which stands somewhat higher than the true zebra and is more gracefully shaped.

Ant-bears and Pangolins

The aard-vark is an almost hairless burrowing animal, with long snout, tail and ears, and is often called the ant-bear because it eats white ants. Pangolins or scaly ant-eaters (Plate 35) are covered with scaly plates and resemble armadilloes.

Birds

Divers

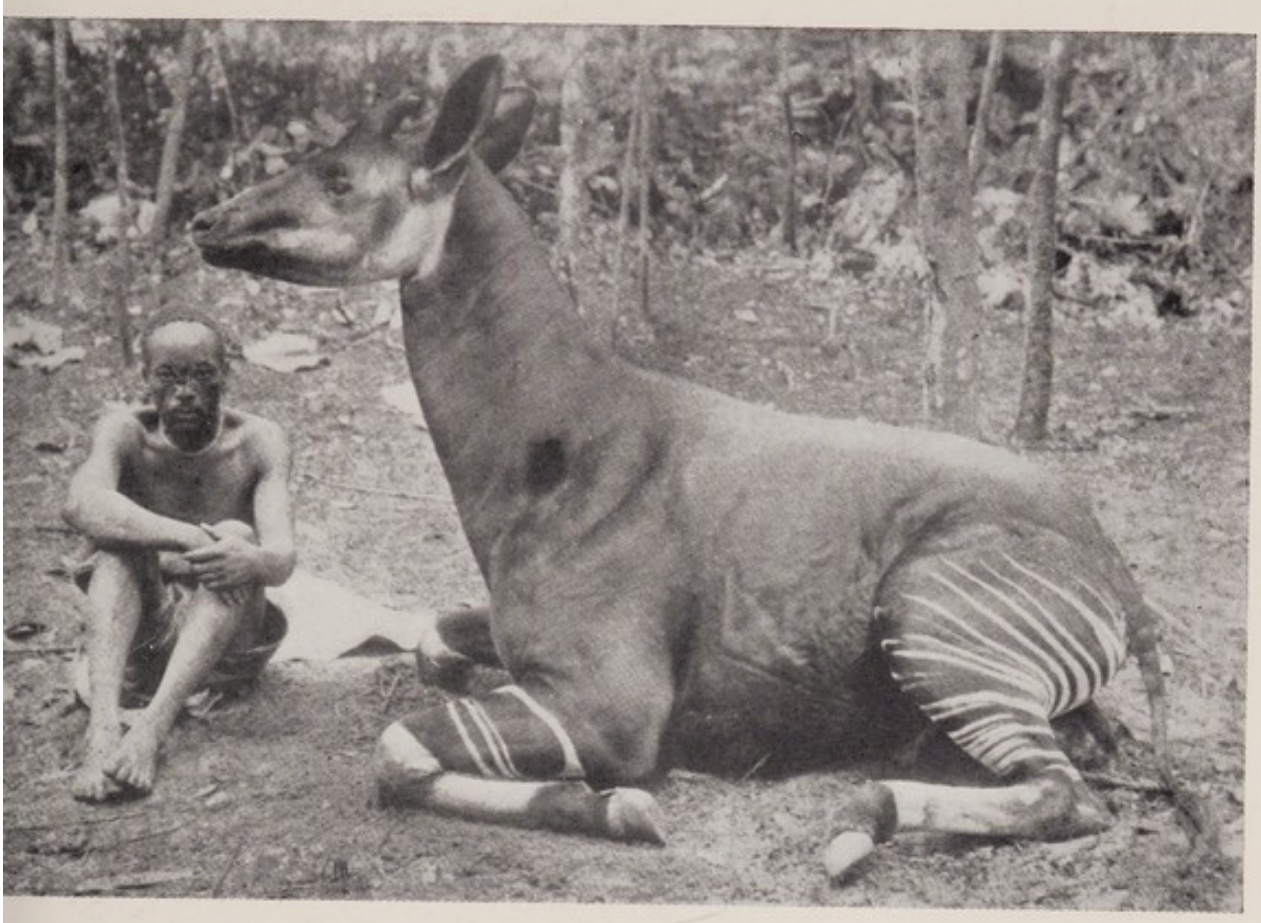
Grebes are seen on Lake Kivu and in Katanga, while dabchicks are common throughout.

Pelicans and Cormorants

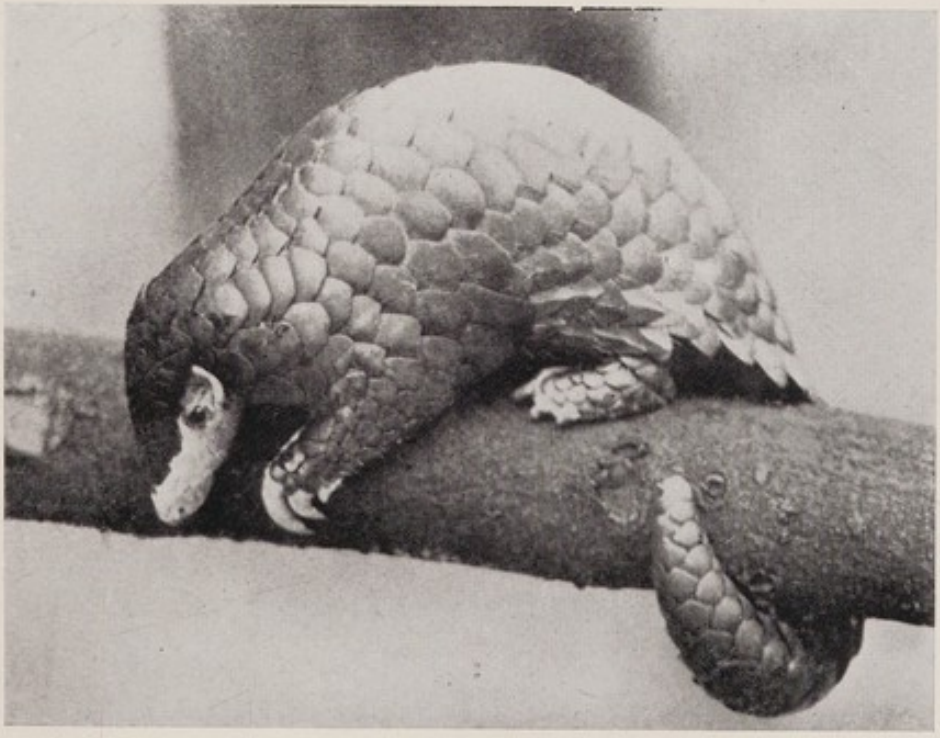
The former may be seen fishing on the largest rivers and lakes. The latter are even more widespread.

Storks and their Allies

Storks migrate to the Belgian Congo. One may see the whale-



34. *Okapi*



35. *Pangolin*



36. *Secretary bird killing a snake*



37. *Lily-trotter*

headed stork or shoe-bill of the Nile. The open-billed stork has a chink between the mandibles. The saddle-billed stork gets its name from an outgrowth of skin at the base of the beak. The marabout or adjutant is of importance as a scavenger. Herons include the night heron and the black-headed heron. The hammer-head is a bird of about the size of the black-backed gull, with a tuft on the back of its head, and is a link between herons and storks. Bitterns boom in the

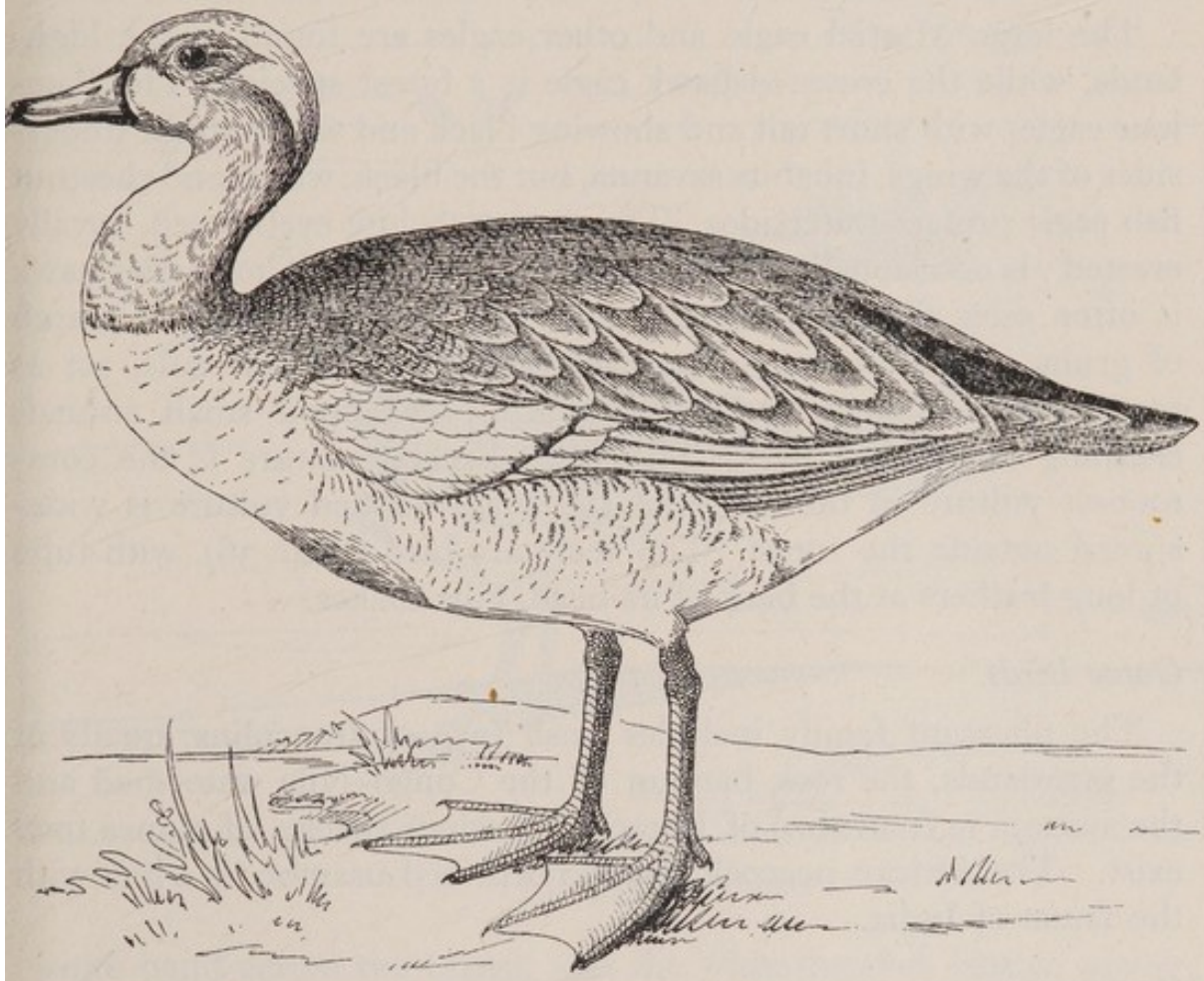


FIG. 22. *Egyptian Goose*

swamps. The great white egret and the little cattle egret or cow-bird are both found in the Belgian Congo. Ibises are distinguished by their down-curved bills and include the sacred ibis and the dark bronze Hadada or Hagedash ibis. The wood ibis is really a stork, but has a curved orange bill. The white spoonbill haunts Stanley Pool. Small flamingoes are occasionally seen in the east.

Ducks and Geese

A chestnut duck with black head and pale blue wings (Hartlaub's duck) may be seen on forest pools, and the white-faced tree duck or

whistling teal frequents swamps and lagoons. East African species include the African ruddy duck, white-backed duck, African pochard, and red-billed duck. Geese include the pygmy goose, not larger than a bantam, the knob-bill, dark green with white underparts, the black and white spur-wing, and the Egyptian goose (Fig. 22), with large chestnut-red patch round the eye.

Birds of Prey

The large Martial eagle and other eagles are found in the highlands, while the crowned hawk eagle is a forest species. The Bateleur eagle, with short tail and showing black and white on the undersides of the wings, inhabits savanna, but the black, white, and chestnut fish eagle prefers watersides. The osprey, 'white eyebrowed, royally crested', is occasionally visible in the Congo basin. The harrier hawk is often seen clinging to tree-trunks with beating wings, in search of grubs. Kestrels are numerous. Kites, with forked tails, act as scavengers. The grasshopper buzzard preys upon small animals escaping from bush fires. The white-backed vulture is the commonest vulture in the east, but the small hooded vulture is widespread outside the forest. The secretary bird (Plate 36), with tufts of long feathers at the back of its head, kills snakes.

Game Birds

The pheasant family includes bush fowl or francolins, quails of the grasslands, the rock bantam of the Congo–Nile watershed and the swampi (a francolin) of Katanga. Various species of guinea fowl exist. The African peacock, found north of Lusambo, is a link with the fauna of India.

Rails and Fin-foots

The large wood rail or nkulungu is a forest bird. Crakes are found in grassland and purple gallinules at watersides. The white-spotted, dark brown and green fin-foot, with fringed toes, runs swiftly through undergrowth.

Cranes, Bustards, and their Allies

The booming cry of the crowned crane is heard in Katanga and on the eastern frontier before rain. The black south African wattled crane, with white neck and lappets below the throat, occurs in Katanga and up the Kasai. Bustards are birds of the open country. Stone-curlews are long-legged, large-headed birds, like plovers,

living on open wastes. The chocolate-brown, greenish-black and cream Jacana runs over water-lily leaves and is called the lily-trotter (Plate 37).

The Plover Tribe

All are adapted to a life in open country, generally near water. Plovers include the Egyptian plover (Fig. 23). Kittlitz's sand plover, allied to our little Kentish plover, the three-banded plover, with

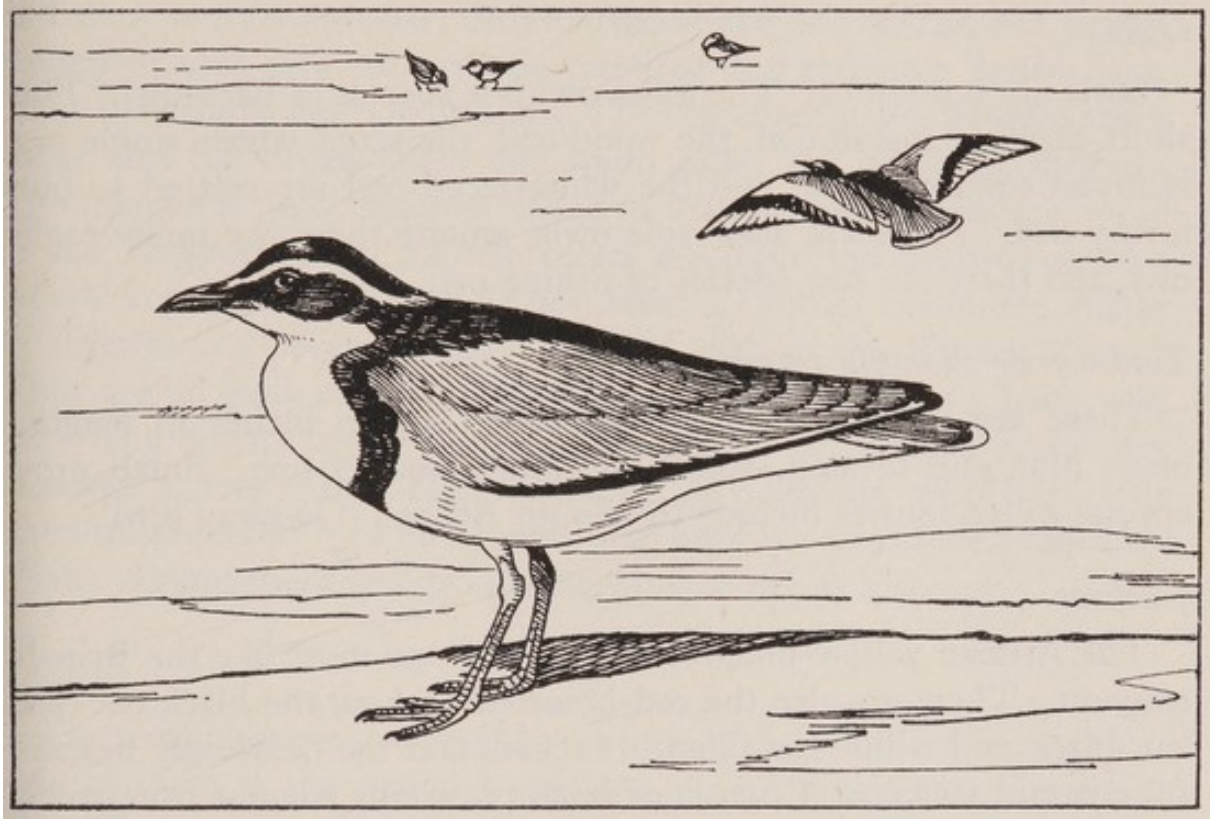


FIG. 23. *Egyptian Plover*

white band across the breast, and the white-headed wattled plover, with yellow wattles. The painted snipe resembles a sand-piper. The crowned lapwing has a V-shaped mark on its black head, and another lapwing—the spur-wing—is black, white, and brown in colour. The group includes the stilts and the coursers (like long-legged plovers). Pratincoles are small birds like swallows found on sandbanks. There are gulls and terns on the lakes. The skimmer is a tern which flies low over water and ploughs the surface with its beak.

Pigeons and Button-quails

There are several widespread species of pigeons and doves, including green and yellow fruit pigeons with red bills, the copper-bronze laughing dove, the little long-tailed dove, and the blue-

spotted dove. Button-quails, like tiny partridges, inhabit the eastern grasslands.

Parrots

The common grey African parrot is spread throughout the Congo, and there is a pink variety in the south-west. Small green and parti-coloured parrots consume crops. There is a red-headed, black-collared species of love-bird.

Owls

Owls are numerous. The grass owl is a species of barn-owl. The short-eared or marsh owl, the wood owl, the scops whose single cry is heard towards dusk, and the white-faced owl are related to our tawny owl. There are also eagle owls, among them the milky eagle owl, and there are two species of fishing owl.

Touracos or Plantain-eaters

These are noisy, cackling birds, about 15–30 inches in length, often blue and crested, which dip from tree to tree. Small grey species called louries include the South African 'Go away bird'.

Cuckoos

The African yellow-billed cuckoo is the one most like the British migrant. There are also the red-breasted cuckoo, the black cuckoo, the black and white Levaillant's cuckoo, and the dazzlingly beautiful emerald cuckoos. Coucals or bush pheasants suggest overgrown cuckoos and include the bottle-bird or fool-bird with its bubbling call so familiar in the African bush.

Colies

These are little brown or grey birds like sparrows, but with long tails, which creep about branches and are also called mouse birds. They are fond of pawpaws.

Nightjars

Nightjars or goatsuckers are plentiful in open country and some have wing feathers which float behind like pennants as they rise silently from the ground at dusk.

Swifts

Among the swifts which wheel in the African sky are palm swifts,

spine-tailed swifts, the shafts of whose tail feathers protrude beyond the webs, and the mottled swift and alpine swift which are found high up on Ruwenzori.

Kingfishers and their Allies

Kingfishers are of many hues—blue, grey and white, or pied with red or chestnut. Two may be selected—the malachite kingfisher, with black and blue-barred crest and blue-black and red underparts, and the pygmy kingfisher, ultramarine above and orange-red below. Rollers or blue jays are brightly coloured and resemble British jays. They turn somersaults in mid-air. The lilac-breasted or Moselikatze's roller and the broad-billed cinnamon roller are found in savanna. The hoopoe is an occasional visitor to Britain, and species are found in the Belgian Congo. Their crests resemble the head-dress of a North American Indian. The bee-eater is another occasional visitor to Britain, and several species are met with in the Belgian Congo. They are all gaily coloured birds, usually with green as a basis, and have long down-curved bills, which they use to purpose when they discover a bees' nest. Different sorts of hornbills, with huge bills often ornamented by a bony crest, flap heavily across forest clearings (Plate 38) and there is a ground hornbill as big as a turkey.

Trogons

The trogons are spread over the forests of Asia and South America. One of them is the national emblem of Guatemala and figures on its postage stamps. African species are very beautiful, with shining green upper parts, rosy red underparts, and white in the tail. The bar-tailed trogon is confined to the eastern mountain forests.

Woodpeckers, Barbets, and Honey Guides

There are several kinds of woodpeckers, many of them golden olive above and spotted and barred below. A minute species is the piculet, only 3 inches from the tip of the bill to the end of the short tail. The traveller in the bush sometimes hears a metallic sound which reminds him of a smithy. This is the note of the tinker-bird or copper-smith. The barbets, of which it is one, are small rather heavily built birds with large bills. They are often black with bright red markings. The hairy-breasted barbets have the shafts of the breast feathers prolonged like bristles. The honey guide is about the size of a sparrow, ash-brown above and dirty-white below. It is

said to lead people to bees' nests so that it may pick up the grubs when the comb is rifled.

Perching Birds

Broadbills live in dense forest. They have unusually wide bills, ending in a sharp hook, and the plumage is olive-brown, grey, and black. The clapping lark can be heard beating its wings together when it is almost out of sight. A pied wagtail frequents courtyards. Pipits and their allies the long-claws are common in open country. Brownish babblers or seven sisters go about in chattering parties. The words 'Quick, doctor, quick!' recall the notes of a common bulbul not unlike a thrush.

Flycatchers are more vividly coloured than our species. The male of the paradise flycatcher has long floating white plumes in his tail. Thrushes, chats, and warblers include the rock thrush of Northern Rhodesia, blue and chestnut beneath; ant-thrushes which feed on the swarms of insects driven out by driver ants; robin chats; bush-robins, and numerous warblers.

The colouring of the various species of swallows differs slightly from that of our home species. Rough-winged swallows have the front edge of the wing rough to the touch. The rock-martin resembles the sand-martin but builds among rocks.

Shrikes or butcher birds, like their British counterparts, stick their insect food on thorns. There are several species. A pair of bell-shrikes produce bell-like notes in turn, making one musical phrase. The puff-backs are shrikes whose males display a 'powder puff' of feathers on the rump. Cuckoo shrikes also have heavily feathered rumps and are about the size of starlings. Drongos are black, green, or blue-black, and often glossy. Like shrikes they perch on the lookout for insects.

A glossy black tit, with white edges to its wings, is common outside the forest. Sunbirds correspond to the humming-birds of South America. White-eyes have a ring of white feathers round the eye. True finches are scarce, but the wild canary is widespread in open country.

Weaver-birds are famous for their woven nests. Some species may be noted. The male bishop-bird is fiery red in colour and is found in savanna, usually near water. Male whydah-birds or widow-finches, with long floating black tail feathers, frequent long grass. Tiny rose-red fire-finches, the cordon bleu, waxbills, and cut-throats are familiar to us in aviaries.

The brown oxpecker or rhinoceros bird, with yellow red-tipped bill, picks insects off cattle and is a species of starling. There are also metallic green or blue Glossy Starlings. Golden orioles, with black wings and tail, and black-headed orioles, like well-wooded country. The black and white pied crow is common, and the scapulated crow, also black and white, and a raven with a white neck-patch, may be seen in Katanga.

Reptiles

Tortoises

The *Kinixys* tortoise has a hinge in the hinder part of its shell which it can close down. Freshwater tortoises and soft-shelled river turtles also exist.

Crocodiles (Plates 39 and 40)

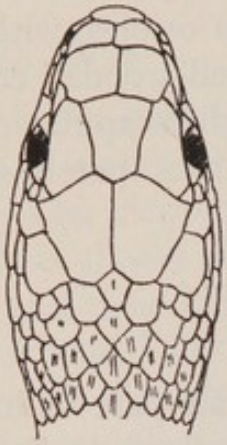
The common African or Nile crocodile is found all over the Congo basin in rivers of any size. Lake Tanganyika is infested by this kind, and so are Stanley Pool and the islands and sandbanks of the Congo. This is the largest species and may grow to 16 feet. It has a broad head and blunt nose and is dangerous. A west African species, the slender-snouted crocodile, has a long thin snout and is purely a fish-eater. It is confined to the rivers. The small black short-headed crocodile, also belonging to west Africa, is found along the northern equatorial forest belt from the west to the upper Ituri. Another species, not more than 5 feet long, is restricted to the small northern streams of the Congo system. There are no crocodiles in Lakes Edward and Kivu.

Lizards

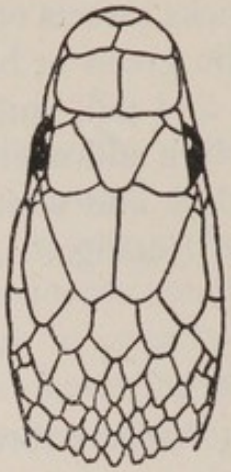
Lizards are numerous. The large monitors eat crocodiles' eggs. The males of a common species of lizard are rusty-red and blue-grey. Others have very long tails. Geckos are nocturnal and have suckers on their feet by means of which they run upside down. Skinks are like small snakes with rudimentary legs. Chameleons include the three-horned chameleon found only in the forest.

Snakes (Fig. 24)

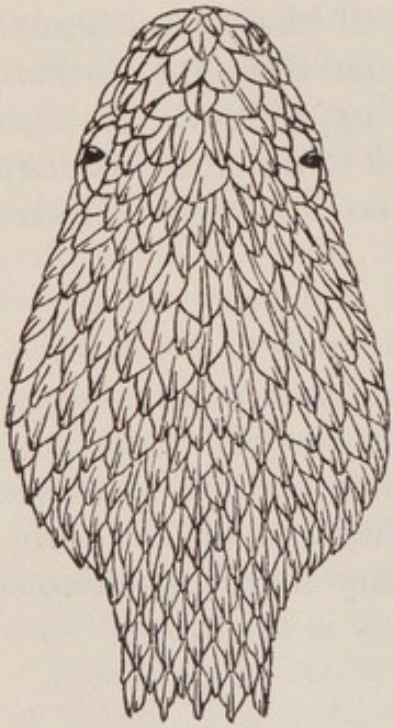
Snakes need not be unduly feared by a booted white man, since all except puff-adders will usually get out of his way. The principal poisonous snakes may be briefly described. The south African boomslang or tree snake is sometimes 6 feet long. It has a convex



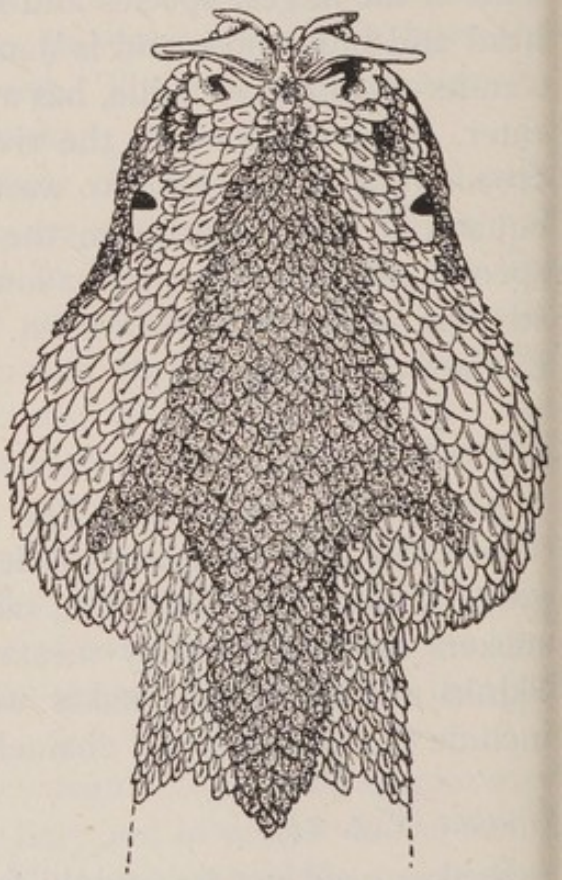
Boomslang
(Dispholidus typus)



Forest Mamba
(Dendraspis jamesoni)

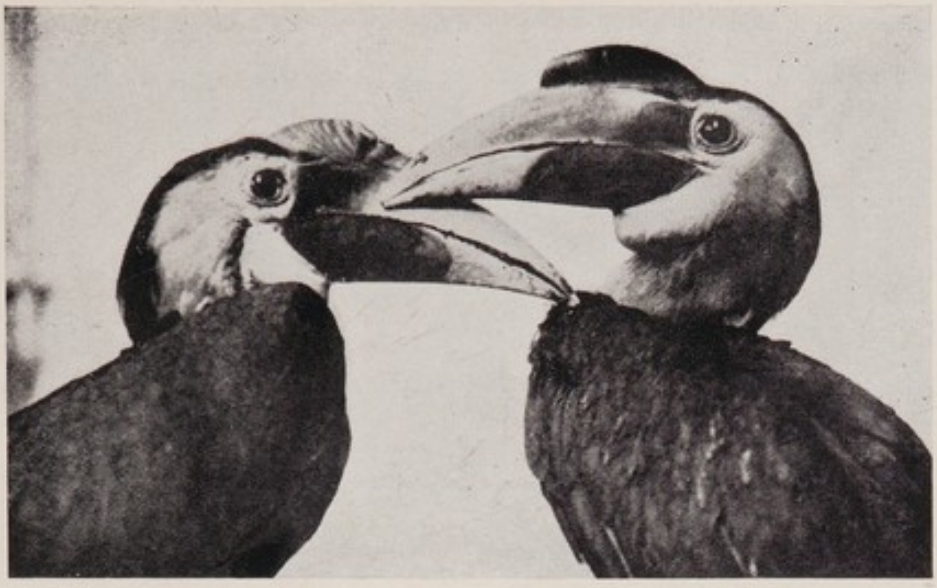


Tree Viper
(Atheris squamigera)



Nose-horned Viper
(Bitis nasicornis)

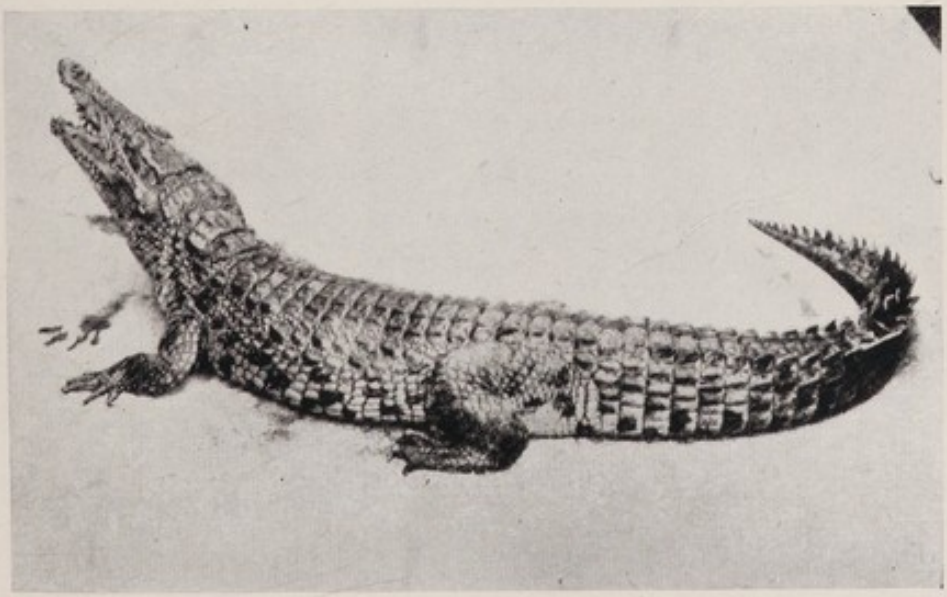
FIG. 24. *Typical Snakes*



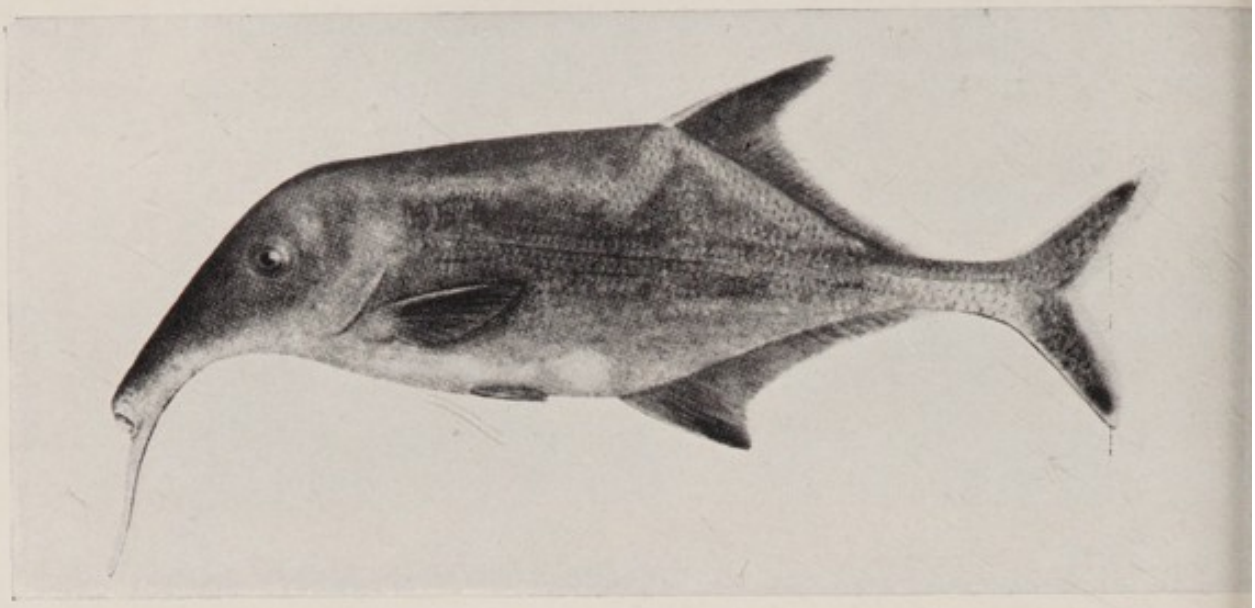
38. *Hornbills*



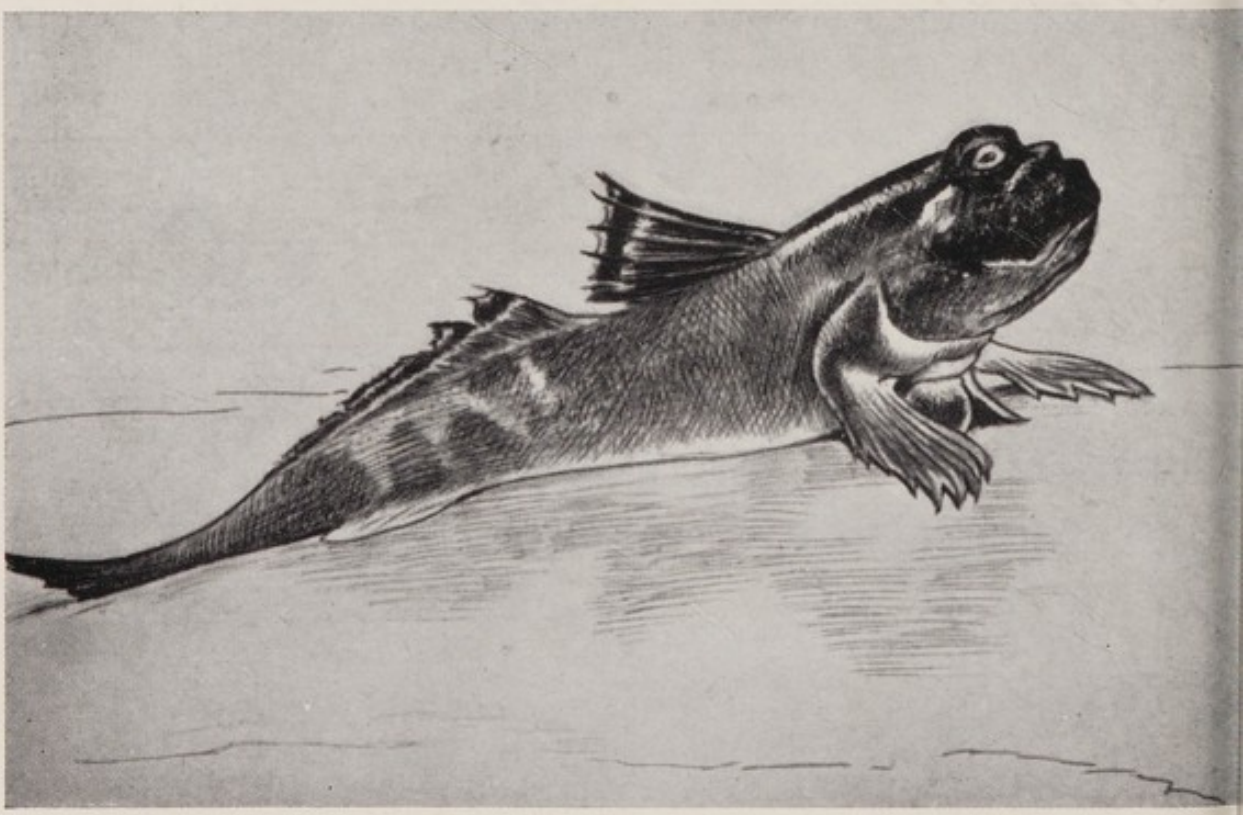
39. *Sharp-snouted Crocodile* (Crocodilus cataphractus). *Lives principally on fish*



40. *Nilotic Crocodile* (Crocodilus niloticus)



41. *Mormyrid*



42. *Mud skipper*

head with large eyes. In colour it varies from blue, grass green, grey, or light brown to black. Cobras when excited expand the neck into a 'hood', and some of them spit a stream of venom at the eyes of an attacker. The Egyptian cobra, which has been taken at Faradje, varies in colour from grey to blackish brown and may reach 8 feet in length. The mamba has a long head, very distinct from the neck, and oblique narrow scales. Its colour varies from green or grey to almost black. Twelve feet is not an uncommon length. It is a tree-snake, but can travel fast on the ground and has the reputation of attacking human beings. These attacks, however, are probably limited to its breeding-season. Vipers have heads like an ace of spades and include puff adders. These have bloated bodies, 4–5 feet in length, stubby tails, and a carpet pattern of marking. The nose-horned viper or river jack has enlarged scales on the nose forming horns. When disturbed puff adders inflate themselves and hiss. They can strike with lightning rapidity. Besides the poisonous snakes there are fangless snakes as well as pythons and other constrictors. Some of the former closely resemble poisonous species.

Fish

There are large native fisheries near Stanleyville, while both natives and European concessionaires fish the lakes of the north-east and the waters of Katanga.

Freshwater herring occur at Stanleyville in immense shoals near the shore and are taken in seine nets. A species of barbel is caught in fish-traps at rapids and makes excellent eating, while another species is caught with hooks. Many catfish are in request as food. They usually have large flat heads with long feelers. One of them—the electric fish—produces a shock which can be strongly felt through a thick leather sole. Many species of cichlid (related to the perch) are of great food value.

Small beaked fish are called mormyrids (Plate 41). The butterfly fish or freshwater flying fish often leaps out of the water and flutters through the air for a short distance. The tiger fish or water leopard has formidable teeth but does not attack men. It may scale 100 lb. Some are readily caught with hooks.

Top-minnows destroy mosquito larvae. Nile perch are widespread in the Nile, Congo, and Niger systems. Specimens weighing over 200 lb. have been recorded.

Mud-skippers (Plate 42) have protruding eyes and hop about on

mud-banks by means of their pectoral fins, while climbing perches have spines on the gill-covers which enable them to cross land when a pool dries up. A peculiar type of fish, the lung-fish, can pass the dry season embedded in a mud cell.

Arachnids

The most notorious members of this class are the scorpions, some of the largest of which are found in the forest and others in the drier parts of west central Africa. The long upturned tail carrying the sting, and the large pincers, make them unmistakable. The effect of the sting is extremely painful and may at times, although not generally, have fatal consequences to human beings.

Ticks are notorious carriers of disease. The beetle-mite is a large scarlet mite, quite harmless, which crawls on the ground in wet seasons and is often brought home by travellers.

Myriapods

Some centipedes are 8 inches long and have a very poisonous bite.

Insects

Cockroaches and Locusts

This group includes crickets and grasshoppers as well as the praying mantis, with its front legs like bended knees, and the stick insect with immensely long body and legs. African cockroaches are large and destructive. Locusts and grasshoppers swarm, but it is rare to hear of any devastating plague of migratory locusts except in the extreme east, south, and north.

Termites or 'White Ants'

These are well known on account of their destructiveness and the enormous 'ant-hills' which they build. After rain swarms of the winged forms emerge from holes in the ground, but quickly discard their wings and become food for beast, bird, and man.

Dragon-flies

These include many showy species. All are valuable, as they prey on mosquitoes.

Bugs

The legions of sucking bugs are often very brightly coloured and

many of them malodorous. They include the cotton-stainer (a cotton pest) and the bed-bug. Water-boatmen, water-crickets, and other aquatic species feed on mosquito larvae.

Butterflies and Moths

Butterflies are extremely numerous. Many species are purely African, such as the black and red or yellow Acraeas. Others belong to the same family as our blues and coppers. The enormous silk-moths have transparent panels on the wings and often large eye-like markings on the lower wings. Some of the tiny moths have exquisite patterns like parquetry.

Beetles

Among these may be found insects larger than the smallest mammal or smaller than the largest protozoon. The large ground-beetles should be handled with care as they eject a volatile fluid causing a burning sensation and great pain if it is squirted into the eye. Fire-flies (not very showy in Africa) are related to the common glow-worm. Game trophies are often destroyed by the hairy larvae of bacon beetles, and the wood-destroying larvae of powder-post beetles quickly reduce any temporary bush hut to dust. The cock-chafer tribe is represented by some of the largest insects such as the Goliath beetle.

Ants, Bees, and Wasps

Ants do not all sting, though they all bite. The best known are the driver ants, which have fearsome biting powers but no sting. They hunt in columns, and it is not an unmixed curse to have them sweep through the house and clear out every rat, snake, and insect pest.

Bees are numerous. The wild honey-bee is well known to natives. Carpenter bees bore holes in timber in which they make their nests. Sweat bees annoy travellers by crawling over their hands and faces in search of moisture and tickling intolerably. They leave an unpleasant odour when crushed.

Large black and yellow mason wasps are among the commonest wasps. They fill their mud nests with live caterpillars which they have paralysed with their stings to serve as food for their progeny. More to be avoided are the social wasps or hornets. Their parchment nest hangs by a sort of stalk from a branch or ceiling, and if it is too nearly approached the wasps fly out and inflict extremely painful stings.

Flies

This order includes the sand-fly which causes dengue fever. Mosquitoes and tsetse-flies are considered under Public Health (Chap. VI). Black flies or buffalo gnats are voracious blood-suckers and may render almost uninhabitable the country near the streams in which the larvae live. The immense number of flies of the group containing the house-fly and its blood-sucking relative the stable-fly may be mentioned only to say that, while some convey diseases to man and domestic animals, others are of great importance in destroying caterpillars, grasshoppers, and other insects.

Molluscs

Snails are highly valued as food by natives. The Achatina snails have handsome pointed shells reaching a length of 6 inches or more and lay eggs as large as a pigeon's.

Hunting, Shooting, and Fishing

Regulations

To protect the fauna, game laws have been passed and game reserves established (Fig. 25). The principal reserves are the National Parks or sanctuaries—the Parc National Albert in the Mfumbiro mountains, the Parc National de la Kagera near the Tanganyika frontier, and the Parc National de la Garamba adjoining the frontier of the Sudan. Hunting is prohibited in these parks except in certain buffer zones in which natives only are allowed to kill game for food. Visitors are subject to a charge for each day of their stay and must submit to severe restrictions of movement.

The Albert Park is a notable sanctuary of the gorilla and okapi. It covers 1,000,000 acres and has been placed under the control of an international committee. The Garamba Park shelters the white rhinoceros.

Besides the parks there are the General Game Reserves and the Special Elephant Reserves shown on Fig. 25.

Outside the reserves certain species are protected, either because they are rare or because they destroy pests. These species include the rhinoceros, giraffe, gorilla, chimpanzee, certain monkeys, zebra, okapi, various antelopes, pangolin, egret, stork, shoe-bill, crested crane, owl, vulture, ibis, flamingo, heron, nightjar, and insectivorous birds. Except in the total reserves, lions, leopards, hyenas, hunting-dogs, baboons, birds of prey (but not vultures and owls), crocodiles,

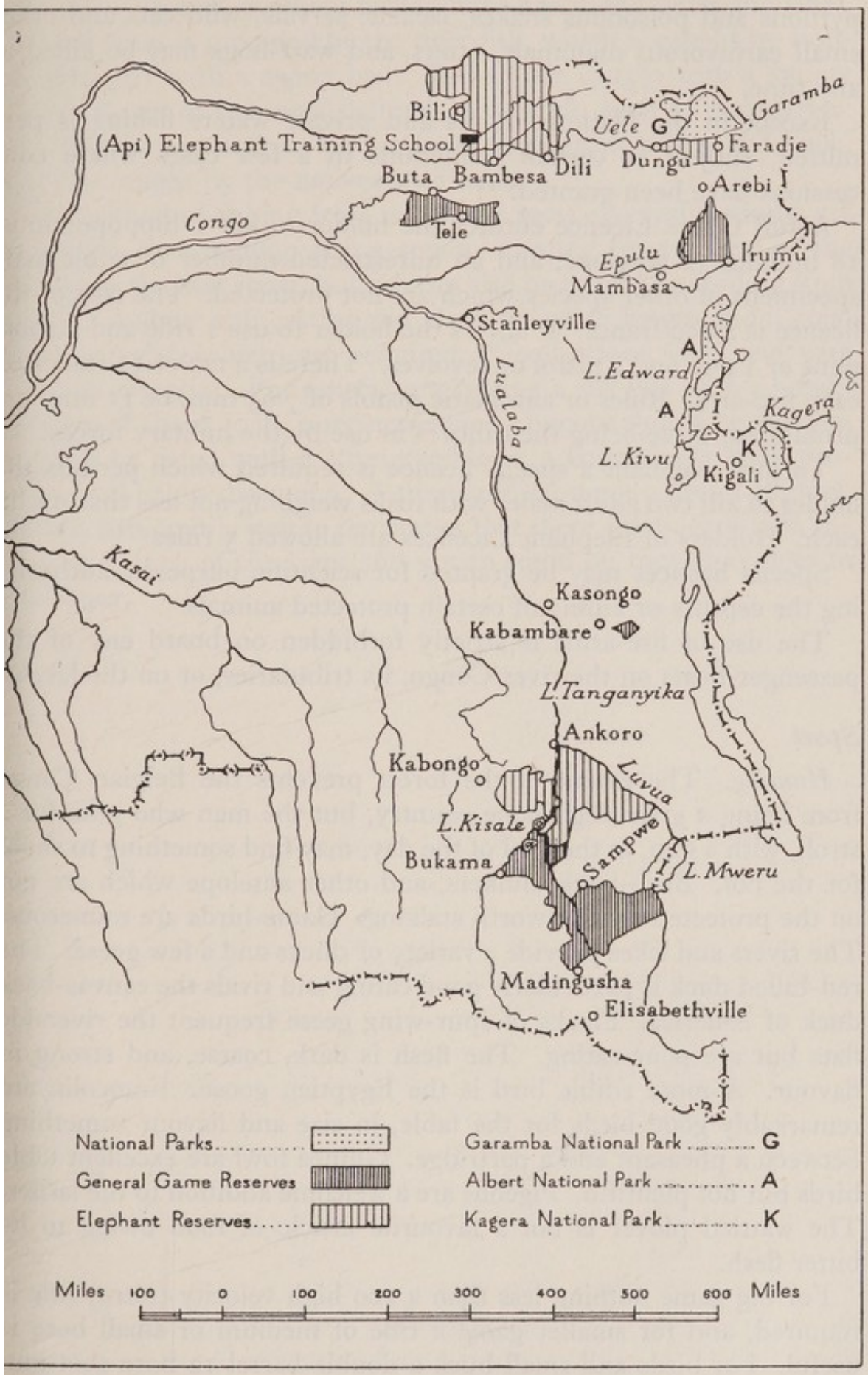


FIG. 25. *Game Reserves*

pythons and poisonous snakes, jackals, servals, wild cats and other small carnivorous mammals, otters, and wart-hogs may be killed at any time.

Except in the National Parks and private waters fishing is permitted, subject to certain limitations in a few cases where concessions have been granted.

A full Game Licence entitles the holder to kill 1 hippopotamus, 18 buffalo, 52 antelope, and an unrestricted number of adult male specimens of other species which are not protected. The cost of the licence is 2,000 francs. It allows the holder to use 1 rifle and 2 shot-guns or 1 gun and a pistol or revolver. There is a tax of 50 francs on each fire-arm. Rifles or automatic pistols of 7·65 mm. or 11 mm. are prohibited, these being the calibres in use by the military forces.

To hunt elephant a special licence is required which permits the holder to kill two adult males with tusks weighing not less than 11 lb. each. Holders of Elephant Licences are allowed 5 rifles.

Special licences may be granted for scientific purposes, authorizing the capture or killing of certain protected animals.

The use of fire-arms is strictly forbidden on board any of the passenger-boats on the river Congo, its tributaries, or on the lakes.

Sport

Hunting. The extent of the forest prevents the Belgian Congo from being a great Big Game country, but the man who goes for a stroll, with a gun, in the cool of the day, may find something to shoot for the pot. Bush-buck, duikers, and other antelope which are not on the protected list are worth stalking. Game-birds are numerous. The rivers and lakes provide a variety of ducks and a few geese. The red-billed duck is particularly good eating and rivals the canvas-back duck of America. Flocks of spur-wing geese frequent the riverside flats but are poor eating. The flesh is dark, coarse, and strong in flavour. A more edible bird is the Egyptian goose. Francolin are remarkably good birds for the table, in size and flavour something between a pheasant and a partridge. Guinea fowl are excellent table birds but not plentiful. Pigeons are a welcome addition to the larder. The wattled plover is not a favourite article of food owing to its bitter flesh.

For big game nothing less than a 400 high velocity (nitro) rifle is required, and for smaller game a rifle of medium or small bore is useful. For birds and small buck a double-barrel 12-bore shot-gun is the most useful.

Fishing. There is excellent fishing to be had in the rivers and lakes. The best sport is provided by the tiger fish, which is caught by trolling, generally with a spoon bait. Barbels are caught with a variety of bait. Some of the most delicate-eating fish, such as mormyrids, have mouths so small as to preclude them from taking the hook. They are caught by the natives with nets.

The method of fishing from which the most successful results are obtained is by spinning with a spoon. Casting from a boat or the rocks gives the best sport, but fish can also be caught by trolling from a canoe. A short stiff casting rod about 8 feet in length and a good spinning reel ($4\frac{1}{2}$ inch) are required. Good strong lines and wire traces are essential. For satisfactory casting a silk line with a breaking strain of about 40 lb. is recommended. Spoons should be 3 inches long and be fitted with a strong treble or a large single hook projecting well below the spoon. A stout landing-net is a useful adjunct.

When fishing it is well to remember that there are crocodiles in the rivers and some of the lakes and not to stand on rocks too close to deep water.

CHAPTER VI

PUBLIC HEALTH

(For districts and provinces see Fig. 43: for tribes Fig 46.)

PERHAPS the most important chapter of the history of Belgian enterprise in the Congo relates to recent activity in the field of public health and the noteworthy progress that has been made therein. It is axiomatic that the prosperity of any country is dependent on the productive capacity of its inhabitants, and in a tropical country such as this productive capacity is a function of health. The productive capacity of the native population of the Congo, decimated by endemic and epidemic disease, and embittered and enslaved by the Congo Free State Administration from 1885 to 1908, had reached a very low ebb. The public health problems were formidable. The vast country extends over 902,000 square miles. Its equatorial situation, heavy rainfall, numerous swamps, and dense bush furnish conditions favourable for the excessive prevalence of many tropical diseases. The diet of the natives was insufficient for health and ill balanced. In many areas death-rates exceeded birth-rates. Endemic diseases included malaria, sleeping-sickness, leprosy, worm infections, bilharziosis, yaws, venereal diseases, and in places tuberculosis. Smallpox and measles were prominent among epidemic diseases. Since 1908 the public health outlook has been transformed. In 1911 the population was about 8½ millions; it now approximates to 11 millions. Means of communication by rail, road, and waterway have been much developed. The populations have become less nomadic than formerly. The extent to which these populations are now subjected to medical supervision and inspection is remarkable. It is claimed that nearly all natives have been seen either by doctors or by their European assistants.

This does not imply that all the medical and health problems of the Congo have found a ready solution; this is far from being the case. There are still areas in which the populations are declining; dietetic deficiencies and insufficiency are still evidenced by deficiency diseases in some areas; the infant mortality rates, though much reduced in the less backward parts of the country, are still formidably high; and the once most formidable scourge, sleeping-sickness, is only held in check by unremitting vigilance. But the nature of the important problems has been defined, and the results already achieved by remedial measures justify hopes of continued steady improvement.

Medical Personnel

Health Administration

The headquarters of the Belgian Congo State Medical Service is in the Ministry of Colonies, Brussels, where the medical chief of the service is responsible for its general direction and recruitment. The special medical service for the employees of the Congo railways was controlled by the State Service. In Belgium, too, there is the Institute of Tropical Medicine at Antwerp. Its role was comparable to that of the London School of Hygiene and Tropical Medicine *vis-à-vis* British colonies. Newly qualified Belgian doctors were encouraged to go to the Congo on five-year contracts, thereby obtaining exemption from two years' military service.

Public health activity in the Belgian Congo is directed by a Chief Medical Officer with headquarters in Leopoldville. In each of the six provinces and in Ruanda-Urundi there is a provincial Director of Health. The work of the Colonial Medical Service is reinforced by numerous semi-official or private health agencies. Prominent among these is Foreami, the Queen Elisabeth Foundation for the Medical Care of Native Populations, a unique institution whose work will be referred to later in this chapter. Several industrial companies have their own hospital and health services. Belgian and foreign missionary societies are active in the public health field. The Congo Red Cross Society has done valuable work. The Medical Foundation of the Louvain University in the Congo (Fomulac), and the Medical Centre of the Brussels University in the Congo (Cemubac) have made valuable contributions.

European Medical Personnel

Government Officers. The distribution of state European medical personnel on the last day of 1939 was:

	Doctors	*Health agents*	*'Religious' nurses employed in*	
			Hospitals	*Dispensaries*
Central Government	1	3	..	..
Provinces				
Leopoldville	36	39	56	34
Lusambo	25	20	10	19
Coquilhatville	31	26	19	23
Stanleyville	27	23	22	36
Costermansville	18	18	7	1
Elisabethville	26	23	34	19
Ruanda-Urundi	19	15	7	..
Foreami	18	20	..	..
Congo	201	187	155	132

Non-officials. The distribution of European medical personnel belonging to industrial companies, missions, and philanthropic organizations at the end of 1939 was:

	Belgian Congo							Ruanda-Urundi
	Leo.	*Lus.*	*Coq.*	*Stan.*	*Cost.*	*Elisa.*	*Total*	
Doctors								
of companies	12	9	2	22	19	23	87	4
,, Foreign Missions	7	5	6	5	2	6	31	6
,, Belgian Missions	2	3	4	4	..	1	14	..
,, Fomulac	3	..	..	..	2	..	5	..
,, Kivu Social Foundation	..	..	..	1	1	..	2	..
,, Cemubac	..	..	..	1	..	..	1	..
,, Congo Red Cross	..	..	..	3	..	..	3	..
private or plantation	..	1	3	5	3	3	15	..
Dentists (private)	2	..	..	..	1	2	5	..
Pharmacists	4	1	1	2	1	3	12	..
Health Agents								
of companies	3	11	..	18	6	8	46	..
,, Congo Red Cross	1	..	1	5	..	..	7	..
,, Foreign Missions	23	..	2	21	1	2	49	..
,, Fomulac	..	..	..	..	1	..	1	..
,, Cemubac	..	..	..	2	..	..	2	..
,, Kivu Social Foundation	..	..	..	..	1	..	1	..
private or plantation	..	..	1	1	..	..	2	..
TOTAL	57	30	20	90	38	48	283	10

Native Auxiliary Personnel of the Medical Service

There are several grades of native auxiliary medical personnel, assistants, *infirmiers* or sick attendants, *aides-infirmiers*, *gardes sanitaires*, and *aides-accoucheuses* or assistant midwives.

Medical assistants undergo a six years' course of training. The most important training centre is at Leopoldville. A smaller training centre at Kisantu is run by Fomulac. Four years are devoted to theoretical studies and two years to practical work. Candidates must speak, read, and write French well, in which language all instruction is given. The course provides a good medical education. If the candidate has been assisted by a government bursary he is obliged to work for Government for at least three years after qualification.

Infirmiers undergo a five years' course of training in either a government or mission school. There are seven such schools. During each of the first three years of this training nine months are devoted to theoretical and three months to practical work in a hospital, laboratory, or with a travelling medical unit. The last two years of the course are occupied in practical work, nursing, laboratory work, dis-

pensing, the keeping of registers, and acquiring special knowledge of Congo diseases. There is also a school for the training of *infirmiers* at Astrida in Ruanda-Urundi.

Aides-infirmiers receive a year's instruction in a nursing institution in one or other of the provinces. Three months of the course are devoted to theory. Nursing and microscopy are the chief subjects of the curriculum. In Ruanda-Urundi there is a school for *aides-infirmiers* at Kitega and further schools have recently been opened at Usumbura, Kigali, and Kabgaye.

Gardes sanitaires have a four years' course of training. Theoretical instruction occupies nine months of each of the first two years and is concerned chiefly with entomology. The remaining months of the first two years are spent in hospitals. During the last two years the students are engaged in practical health work under the supervision of a medical officer of health or an entomologist. There are schools for the training of *gardes sanitaires* in Leopoldville, Stanleyville, and Elisabethville.

Aides-accoucheuses are given a two years' course of training in midwifery. At the end of 1939 there were:

	Belgian Congo, 1939								*Ruanda-Urundi 1938*
	Leo.	*Lus.*	*Coq.*	*Stan.*	*Cost.*	*Elisa.*	*Foreami*	*Total*	
Medical assistants and *Infirmiers* . .	34	28	23	67	21	60	25	258	29
Aides-infirmiers . .	326	251	215	394	229	112	273	1,800	138
Gardes sanitaires .	11	..	4	13	..	10	..	38	4
Aides-accoucheuses .	16	4	11	8	3	4	..	46	..

Services and Institutions

Hygiene and Sanitation

In his annual report for 1939 the Chief Medical Officer summarizes the chief objectives and present trends of medical activity in the Congo. Rural hygiene continues to occupy the attention of the medical staff, working in collaboration with local European and native civil authorities and missions. Cleaning up villages, clearing bush and scrub in the vicinity of villages, excreta disposal, anti-mosquito measures, improving housing and water-supplies, improving agricultural methods, and hygiene propaganda will call for long years of effort, but progress is being made. The study of the diet and nutrition of native races is receiving the attention of individual doctors in connexion with outbreaks of deficiency diseases, but this important

matter calls for systematic inquiry by a group of specialists. Considerable progress has been made in safeguarding the health of organized labour forces, thanks to the efforts of the medical staffs of large industrial enterprises working in collaboration with the government medical service. The sanitation of the large towns is on the whole adequately attended to, but a good deal remained to be done such as the filling of marshland in Boma and Coquilhatville, the tidying of small watercourses in Elisabethville, and the reclamation of waste land in a number of towns.

Infant Welfare

Maternity and infant welfare work has been taken up enthusiastically; considerable sums have been collected by a philanthropic association for the development of maternities and prenatal and infant consultation centres. In this work the missions are active. The 1939 report publishes statistics of the work done by 393 infant welfare centres, and the list is incomplete. In Ruanda-Urundi there were, in 1938, 14 infant welfare centres subsidized by the State.

Hospitals and Dispensaries (Fig. 26)

In the beginning the work of the medical services was chiefly directed towards the control of sleeping-sickness which was then the outstanding menace. Now that this disease has almost everywhere been brought under control the medical staff has been able to expand the range of its activities. The number of rural hospitals and dispensaries has much increased. All diseases have received increased attention, notably leprosy and the venereal diseases. Much extended road communications have facilitated the adequate medical supervision of the native population.

All the native inhabitants of the Congo, except for a few isolated groups in almost inaccessible localities, and the pygmies, have medical certificates which they must produce when they travel. Their state of health is noted on these cards at more or less regular intervals. If suffering from a disease the patient is given also a treatment chart.

The distribution of state and private hospitals for Europeans and natives is shown on the map which has been compiled from information contained in the Congo Health Report for 1939, and the Administration Report of Ruanda-Urundi for 1938.

During 1939 government medical officers treated 23,982 Europeans, including 4,350 as in-patients of hospitals. Natives treated in governmental and Foreami institutions in that year totalled 1,200,473.

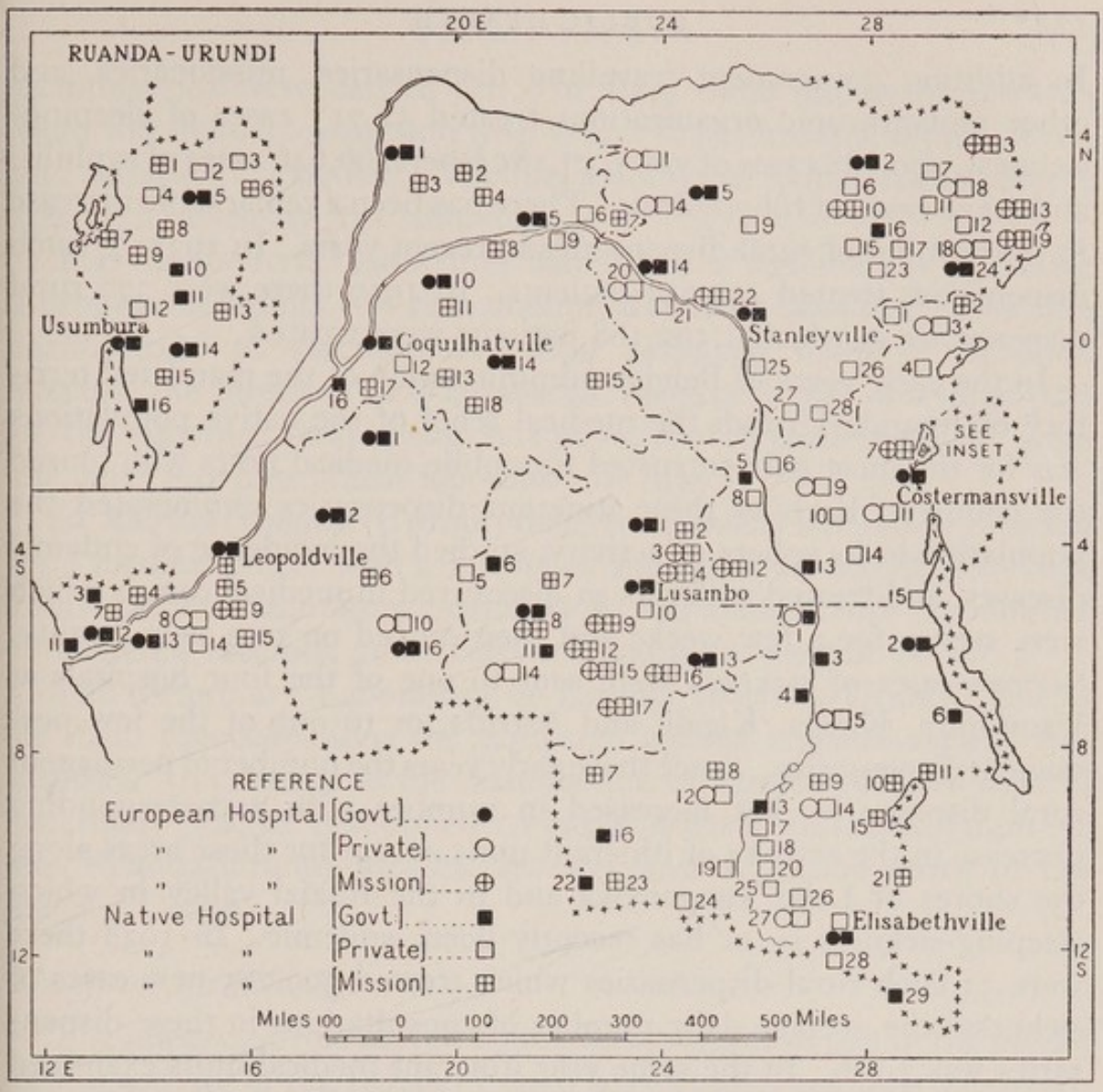


FIG. 26. *Distribution of Hospitals by Provinces*

Leopoldville

1. Inongo
2. Banningville
3. Tshela
4. Kibunzi
5. Sona Bata
6. Djuma
7. Vaku
8. Thysville
9. Kisantu
10. Leverville
11. Banana
12. Boma
13. Matadi
14. Cattier
15. Kimvula
16. Kikwit

Coquilhatville

1. Libenge
2. Karawa
3. Bwamanda
4. Binga
5. Lisala
6. Alberta
7. Lolo
8. Pimu
9. Mongana
10. Basankusu
11. Monieka
12. Flandria
13. Lotumbe
14. Boende
15. Mondombe
16. Irebu
17. Tondo
18. Wafania

Stanleyville

1. Kulu Matundu
2. Niangara
3. Aba
4. Aketi
5. Buta
6. Paulis
7. Tora
8. Watsa
9. Lundo
10. Ibambi
11. Moku
12. Mongbwalu
13. Fataki
14. Basoko
15. Babeyru
16. Wamba
17. Bayenga
18. Kilo
19. Rethi
20. Elisabetha
21. Isangi
22. Yakusu
23. Yimbi
24. Irumu
25. C.F.L.
26. Angumu
27. Punia
28. Kina

Lusambo

1. Lodja
2. Tshumbe Ste. Marie.
3. Wembo Niama
4. Minga
5. Brabanta
6. Port Francqui
7. Bulapa
8. Luebo
9. Mutoto
10. Bakwanga
11. Matamba
12. Luluabourg St. Joseph
13. Kabinda
14. Tshikapa
15. Hemptinne St. Benoit
16. Bibanga
17. Lubondaie

Elisabethville

1. Kongolo
2. Albertville
3. Kabalo
4. Ankoro
5. Manono
6. Moba
7. Kapanga
8. Mwilambwe
9. Mkulu Malemba
10. Luanza
11. Pweto
12. Kamina
13. Bukama
14. Mitwaba
15. Mitwa
16. Sandoa
17. Luena
18. Kikole
19. Busanga
20. Lubudi
21. Kasenga
22. Dilolo-Gare
23. Kakwata
24. Mut
25. Tenke
26. Kambove
27. Panda
28. Kipushi
29. Sakania

Costermansville

1. Mangurudjiba
2. Oicha
3. Butembo
4. Mabenga
5. Lokandu
6. Kailo
7. Katana
8. Kindu
9. Kalima
10. Alimba
11. Kamituga
12. Tunda
13. Kasongo
14. Saramabila
15. Kukua

Ruanda-Urundi

1. Shyira
2. Rutongo
3. Bugarula
4. Katumba
5. Kigali
6. Gahine
7. Ngoma
8. Kabgaye
9. Bufundu
10. Astrida
11. Mgozi
12. Butara
13. Buhiga
14. Kitega
15. Matana
16. Rumonge

In addition government travelling dispensaries, missionaries, and other philanthropic organizations treated 52,717 cases of sleeping-sickness, 270,188 cases of yaws, 73,185 lepers, 66,646 cases of syphilis, and 2,428 cases of tuberculosis. There has been a remarkable increase in the number of rural dispensaries in recent years. In 1933, 77 such dispensaries treated 491,053 patients. In 1939 there were 377 rural dispensaries in which 1,502,368 patients were treated.

In the early years of Belgian administration of the mandated territory of Ruanda-Urundi the medical relief of the native populations was for the most part entrusted to mobile medical units who toured the country. Each of these itinerant dispensaries enumerated the population in its sphere of activity, studied the incidence of endemic diseases, and treated sufferers so discovered in medical camps which were set up for a few weeks and then moved on to a new locality. Serious cases of sickness were sent to one of the four hospitals at Usumbura, Kitega, Kigali, and Astrida, or to one of the few permanent dispensaries. Since those early years the number of permanent rural dispensaries has increased in number with a corresponding decrease in the activity of itinerant units except for those areas along the shores of Lake Tanganyika and in the Ruzizi valley in which sleeping-sickness is, or has recently been, endemic. In 1938 there were 33 such rural dispensaries which treated 309,785 new cases of sickness; the average daily number of consultations in these dispensaries was 3,126. In the same year itinerant medical units examined 1,583,726 individuals and treated 250,897. The four government hospitals mentioned above and three secondary hospitals at Ngozi, Rumonge, and Kabgaye treated 5,513 native in-patients.

Laboratories

In Leopoldville there is the Princess Astrid Institute of Tropical Medicine. The staff of the laboratory of this institute in 1939 included a doctor, a veterinary surgeon, an entomologist, a chemist, and four European assistants. Vaccines of all kinds are manufactured here. In addition to a very large amount of routine bacteriological, serological, and other laboratory work, much research work is carried on.

In Coquilhatville the medical director of the laboratory has a European assistant. In 1939, in addition to the usual large amount of routine laboratory work, investigations were carried out on intestinal parasitism, rabies, and syphilis.

The Stanleyville laboratory was staffed by two medical officers and three European assistants. A very large number of clinical laboratory

examinations were carried out. In 1939 some important research work was done in connexion with yellow fever, malaria, typhus fever, and intestinal parasitism. The manufacture of living plague vaccine was undertaken by this laboratory.

The Elisabethville laboratory had a staff of two doctors and three European assistants. A vast amount of routine laboratory work, the manufacture of vaccines, including 2,089,000 doses of smallpox vaccine, the direction of a large-scale malaria survey of a large part of the province, and research into animal trypanosomiasis, were the chief activities of this laboratory in 1939.

In Astrida (Ruanda-Urundi) there is a medical laboratory directed by a medical officer with a European assistant. Its activities include routine clinical laboratory examinations, the manufacture of a number of bacterial vaccines, and a certain amount of research work.

The Veterinary Laboratory of Kisenyi (Ruanda-Urundi) had as its main preoccupations the campaign against trypanosomiasis and anthrax. In addition to the manufacture of various vaccines used in veterinary practice it supplied 1,133,000 doses of smallpox lymph for the Ruanda-Urundi medical services and 1,336,000 doses to the Belgian Congo.

Unofficial Medical Agencies

The important role played by unofficial organizations in the public health activity of the Belgian Congo has already been referred to. In this respect the Congo resembles Belgium, where so many health activities of fundamental importance are entrusted to subsidized private enterprise. Foreami is the most important of the unofficial reinforcements of the State Health Service. The activities of the State Service and Foreami combined, in so far as the medical care of native populations is concerned, are commonly referred to as Sami, which means *Service de l'assistance médicale aux indigènes*, in contradistinction to Sadami, *Services auxiliaires de l'assistance médicale aux indigènes*, which includes all medical activities in this field carried out by other philanthropic organizations.

Foreami was founded in 1930 and endowed with capital including 100,000,000 francs from the Congo Government, 50,000,000 from the Belgian Government, and 288,000 from Queen Elisabeth. The aim of Foreami is laudably ambitious; it amounts to the gradual progressive cleansing of the whole country, or in the words of the charter, 'to undertake an intensive curative and prophylactic mission with the object of combating endemic and epidemic diseases

and of promoting social works to foster the qualitative and quantitative development of the race'. To execute so ambitious a programme it was obviously necessary to concentrate on a relatively limited area for a number of years. In this area the whole population is enumerated and inspected. Dispensaries, rural maternities, infant welfare centres are created. With the aid of the provincial authorities communications are improved and efforts are made to increase agricultural production and thus enrich the scanty dietary. Appreciable improvements in the sanitation of villages are realized. The area is divided into a number of areas in each of which a doctor assisted by an *agent-sanitaire* and native personnel assumes the medical care of some 30,000 natives. When some years of this intensive effort have resulted in the human 'reclamation' of the area, the State medical service, assisted by Sadami, assumes charge, Foreami moving on to some new backward area. Foreami began work in 1931 in the Bas-Congo, where sleeping-sickness was then very rife. In 1936 it transferred its activities to the Kwango district. By the end of 1938 it had constructed in that district 29 principal dispensaries and 220 rural dispensaries, and was spending annually some $7\frac{1}{2}$ million francs on medical assistance alone. In 1939 the staff of Foreami included 18 European doctors, 20 *agents-sanitaires*, and was assisted by 11 missionaries: 598,998 natives were examined, 396,122 cases of sickness were treated, among them being 2,350 new cases and 3,873 old cases of trypanosomiasis.

The Congo Red Cross Society has two venereal disease dispensaries in Leopoldville staffed by a doctor, a European nurse, and five native assistants. Another section in Coquilhatville is also engaged in the campaign against venereal disease. The most important work of the Congo Red Cross is carried out in the Uele district. With a staff composed in 1939 of 3 doctors, 3 midwives, 3 *agents-sanitaires*, and 76 native assistants, the society had a hospital and dispensary in Medje, a small hospital, dispensary, and laboratory in Pawa, and a small hospital and dispensary in Ibambi. In seven villages grouped around the central leper hospital in Pawa accommodation was provided for 2,088 lepers.

Fomulac, the Medical Foundation of the University of Louvain in the Congo, is one expression of the interest that the Louvain University takes in the welfare of the Belgian Congo. Cadulac, which is concerned with native agricultural improvement, is another. Fomulac has two chief centres of activity, one in Kisantu, the other in Katana. In Kisantu the medical staff in 1939 consisted of

3 doctors, 2 advanced medical students, 6 religious nurses, and 27 native assistants. There was a clinic for Europeans (6 beds), a native hospital (60 beds), a maternity (20 beds), a polyclinic dispensary, 5 dispensaries belonging to Belgian missions, and 12 rural dispensaries. Of the 77,801 natives in the area served by this organization, 61,368 were examined during 1939. There were 255 labours in the maternity. Four infant welfare centres were well attended. A school for native medical assistants and *infirmiers* is run in connexion with these institutions. In Katana two doctors, assisted by an *agent-sanitaire* and four religious nurses, are in charge of a European hospital and a native hospital. During 1939 a total of 188,494 patients were treated, of which 29,015 were suffering from yaws, and 65,944 from phagedenic ulcers.

Cemubac, the Medical Centre of the University of Brussels in the Congo, was in medical charge of the native population in an important part of the Isangi and Opala territory, numbering 66,000. It had nine dispensaries and seven centres, in which therapeutic injections were given. The staff in 1939 consisted of 1 doctor, 2 *agents-sanitaires*, 1 religious nurse, and 37 native assistants. A total of 30,093 new cases was treated during the year.

Together these philanthropic organizations, excluding Foreami, treated 294,441 cases of sickness in 1939. Belgian missions treated 908,273 cases, and foreign missions 348,941.

In Ruanda-Urundi, as in the Congo, missionary societies are very active in the medical field. This activity is subsidized by the Government. In 1938 they treated 375,070 patients. Of these Catholic missions treated 324,586, Belgian Protestant missions, 6,609, Danish Protestant missions 30,756, and Seventh Day Adventist missions 13,119. Five doctors of the Church Missionary Society and one doctor of the Seventh Day Adventist Mission were working as members of the State Medical Service. Together they treated 145,517 patients in 1938. Eleven per cent. of all patients treated by medical missionaries were sufferers from yaws.

All the more important industrial organizations of the Congo have efficient health services. All concessions carry the condition that hospitals and schools must be provided for the native labour forces engaged. The Union Minière du Haut-Katanga had a maternity centre. The Société des Mines d'Or de Kilo-moto had 2 maternity homes, 2 orphanages, and several schools. The Forminière had organized a *berceau* in its endeavours to reduce infant mortality rates. The Huileries du Congo Belge had provided good housing, five boarding

schools, hospitals, a maternity, and a training school for midwives. The Société des Mines d'Étain du Ruanda-Urundi had 4 hospitals containing 299 beds, and the Société Minière de Muhinga et de Kigali (Ruanda-Urundi) was constructing a hospital in 1938 in addition to dispensary accommodation providing 72 beds which it then possessed.

Demography

Demographic data concerning the black races of Africa are rarely sufficient to afford any just appraisement of the state of the public health. Census-taking at regular intervals with the collection of essential relevant data is an operation fraught with obvious difficulties in the conditions prevailing over a large part of the continent. Outside large centres of population, and communities of organized labour, the registration of vital statistics is generally incomplete. In towns and labour camps, where close supervision of the native population is possible, the age and sex constitution of that population is but rarely representative of that of a native community living under more natural conditions. In areas from which labour is recruited for industrial and other enterprise, the withdrawal of an undue proportion of young adult manhood must obviously result in a lowered birth-rate and a heightened death-rate in the residual population.

In the Belgian Congo many special demographic studies have been reported in recent years; together they provide some valuable information. The annual reports of Foreami are of special interest in this regard, comprising as they do as complete a study as is possible of the population under its care.

In the town of Leopoldville (pop. 1939, 41,511) birth-rates of 22·0 and 24·1 per 1,000, in 1938 and 1939, with corresponding general mortality rates of 13·7 and 10·9 may be considered very satisfactory; the native male population is almost double the female population of Leopoldville.

In the Bas-Congo Foreami reported natural increases of population in 1933, 1934, and 1935 of 17·3, 21·4, and 19·8 per 1,000. In the Kwango district (pop. roughly 1,000,000) the rates recorded by Foreami were:

	1937	*1938*
Birth-rate per 1,000	38·99	40·35
General mortality rate per 1,000	28·60	34·85
Natural increase per 1,000	10·39	5·50
Infant deaths per 1,000 births	194	210

Conditions varied very greatly in the different sub-sectors of the Kwango district. In 1938 increases of population amounting to 15·43 and 14·55 per 1,000 were recorded in the Moyen-Kwilu and Bas-Kwilu sub-sectors, and decreases of 12·10, 7·02, and 4·63 per 1,000 in Kahemba, Feshi, and Haut-Kwango. Infant mortality rates were subject to similar great variation from 154 in Bas-Kwango to 353 in Kahemba. Decreasing populations in most cases seem to have been associated with scarcity and food deficiency and in some cases with over-recruitment.

In other parts of the Belgian Congo, in certain areas of the province of Stanleyville for example, venereal diseases are responsible for declining birth-rates. In general it may be said that extended medical care, improved food-supplies, and the development of maternity and infant welfare work are quickly reflected in improved vital statistics.

It would not be justifiable to draw general conclusions for the native population of the Belgian Congo as a whole from the few statistical data set out above. Special inquiries that have been made show how widely conditions vary in different parts of the country.

One remarkable feature of the vital statistics recorded by Foreami relates to the sex ratio of births. In both the Bas-Congo and in Kwango female births exceed male births. In Kwango the ratio Male births/Female births was 0·948, 0·979, and 0·991 in 1936, 1937, and 1938. In the Bas-Congo the ratio was 0·979. In most parts of the world male births consistently exceed female births, in the proportion of about 104·5:100. This phenomenon is so consistent that any large deviation from it can generally be shown to be due to incomplete birth registration. In parts of Asia, for example, statistics persistently show a much higher proportion of male births than 5 per cent. There male births are regarded as of much greater importance than female births and are recorded with fewer omissions. In some such places a study of the registers of maternity hospitals over a long series of years has shown that infants born in such institutions exhibit what one may term a normal male excess of about 5 per cent.

Diseases

The annual public health reports of the Chief Medical Officer of the Belgian Congo contain all available statistical information concerning disease incidence in that country. The annual reports of Foreami deal fully with disease prevalence in the part of the country for which it is responsible. Reports of special investigations and

of scientific medical research appeared regularly in the *Annales de la Société Belge de Médecine Tropicale*. The war caused the suspension of the distribution of that journal, and as a provisional measure the Direction of the Congo Health Services started in January 1942 the publication of a *Recueil de Travaux des Sciences Médicales au Congo Belge*, which it was hoped to issue every six months. Summaries of most of these scientific contributions are to be found in the *Tropical Diseases Bulletin*.

Plague

Bubonic plague is an acute infectious disease caused by the *Bacillus pestis*. It is primarily a disease of rodents, chiefly rats, infection being conveyed from rodent to rodent, and from rodent to man, by the bites of fleas that infest these animals. The infection of house rats precedes the outbreak of human epidemics, but plague infection is kept alive during inter-epidemic periods, in many parts of Africa, by epizootics among wild rodents. In such cases the incidence of human cases affords no indication of the extent of rodent infection. Human cases are likely to be limited to trappers until chance encounter transmits infection from wild to domestic rats.

There are two known areas of plague infection in the Congo, both in the east. The most persistent area is in the Lake Albert region, which has been kept under close observation for many years. The number of human cases reported in any one year is not large: in 1939 there were 65, which is more than three times higher than the number reported in any one of the ten previous years. These 65 cases occurred in 6 distinct foci. Energetic measures were taken. A rat campaign was carried out in 7,798 villages and hamlets; 253,000 rats were examined. Vaccination with a living attenuated strain of the plague bacillus was used on an increased scale; 8,871 natives were so vaccinated without any untoward incident. It is noteworthy that *Rattus rattus*, the ubiquitous long-tailed black house rat, which in most parts of the world is pre-eminent as the plague rat, has not been found in this Lake Albert region. Rats belonging to the following genera were found: *Leggada*, *Lemniscomys*, *Pelomys*, *Arvicanthus*, *Lophuromys*, *Otomys*, and *Mastomys*. The rat fleas identified were species of *Xenopsylla*, *Dinopsyllus*, and *Ctenophthalmus*.

The second centre of plague infection in the Congo is in the Lubero territory near Lake Edward. Plague was first reported here in 1938, when seven fatal cases occurred. A small laboratory was set up in Lubero. The disease reappeared in 1939, when evidence of a small

epizootic was found and two human cases occurred, both children. More than 120,000 rats were destroyed in huts. In this area *R. rattus* is found, and 90 per cent. of the rat fleas are *Xenopsylla braziliensis*.

No plague has been reported from Ruanda-Urundi. There is considerable traffic between this territory and plague-infected areas in Uganda and the Congo. A doctor, two *agents-sanitaires*, and native assistant personnel were on special duty in 1938 to control this traffic from the point of view of plague prevention.

Yellow Fever

No outbreak of yellow fever has been recorded in the Belgian Congo for many years: the last recorded cases were in 1928. But yellow fever is among the important preoccupations of the Congo Health Administration.

Yellow fever is an acute specific infectious disease caused by an ultramicroscopic virus which is conveyed from person to person by the bite of the mosquito *Aëdes aegypti*. This mosquito is widely distributed throughout the world between the parallels 43° North and South, but the distribution of yellow fever is restricted to Africa and to Central and South America. The original home of the disease cannot be determined with certainty, but the first accounts of epidemics which were almost certainly yellow fever came from the West Indies in the seventeenth century (Guadeloupe, 1648). Infection was probably ship-borne from west Africa. On many occasions infected ships visited European ports, but except in south-west Europe the disease never spread. The disease has never been observed either in Asia or Australia.

Recent research has added much to our knowledge of this disease. An attack of yellow fever from which the patient recovers leaves him with a well-developed immunity. Finding yellow-fever immune substances in the blood is indicative of past infection. Large-scale immunity tests of African populations have been carried out. These have shown that the yellow-fever endemic area is more extensive than case reports had led one to expect, extending from the west coast of Africa to the Abyssinian border and south to the river Congo. In some cases positive results in immunity tests of young people indicate recent exposure to yellow-fever infection in places where no clinical cases have recently been reported. Sporadic cases of yellow fever may be very difficult to diagnose. Certain diagnosis necessitates either the examination of liver tissues of fatal cases by an experienced pathologist, or the isolation of the virus from the blood, or immunity

tests with the patient's serum during the fever and later during convalescence. It would not be surprising therefore were sporadic cases commonly overlooked, though large-scale epidemics with a high case-mortality rate would be little likely to escape notice in the Belgian Congo.

Cases occurring in areas with a low rate of endemicity are sometimes very difficult to explain. It may be that the virus is perpetuated by a mosquito-animal cycle; there is evidence that certain wild and domestic animals might act as hosts of the virus. It is theoretically possible that the disease might be transferred by migratory animals.

The remarkable development of rapid means of communication, notably by aviation, has been chiefly responsible for the attention paid in recent years by many health authorities to yellow-fever preventive measures. The introduction of yellow fever into parts of the world in which the mosquito vector is abundant but in which the population have no immunity to the disease might well be a major catastrophe; and there are many such areas.

The Congo Health Administration has not been unmindful of its responsibilities in this important matter. Yellow-fever research work has been undertaken in the laboratories of Leopoldville, Coquilhatville, and Stanleyville. Most work has been done in Stanleyville, for it is in this province that the highest proportion of positive immune reactions has been obtained. By means of an instrument called a viscerotome it is possible to obtain a small piece of liver tissue from the dead body of a suspected case, sufficient for laboratory diagnostic purposes. This procedure is being extended and is assisted by the collaboration of European authorities and native notabilities. In 1939, 837 such samples from the Stanleyville province were examined. None of them provided evidence of yellow fever, but the procedure enabled a diagnosis to be made of several other pathological conditions, including tuberculosis, typhoid fever, and schistosomiasis. Still further immunity tests were carried out in 1939 among the natives in Buta, Bondo, and Likati. In Bondo some positive reactions were furnished by young people. At Likati an outbreak of epidemic jaundice was shown by mouse protection tests to have had no relation to yellow fever. In Stanleyville some research was also being carried out regarding the possibility of mosquitoes other than *A. aegypti* acting as transmitters of infection in the jungle. In the forests of Brazil two such species of mosquito have been definitely incriminated.

The control of yellow fever necessitates early and accurate

diagnosis of cases, mosquito destruction, immunization of persons exposed to the risks of infection, and administrative measures. *Aëdes aegypti* is a domesticated mosquito. It breeds in any casual collection of water in and around human dwellings—empty tins, gourds, faulty rain-water gutters, in fact any receptacle capable of retaining water. Holes in trees containing water also afford facilities for breeding. Scavenging and tidiness can do much to diminish the prevalence of this pest. The provision of a constant piped water-supply eliminates the necessity for storing water in houses and is thus a measure of first-rate importance.

Killing adult mosquitoes in houses by means of an insecticidal spray, such as Flit, is of value, as it is in the case of malaria and other mosquito-borne infections. Mechanical protection against mosquito bites by the intelligent use of mosquito-nets, or by protecting doors and windows with metallic gauze, are measures of great importance. *A. aegypti*, however, does not confine its attacks on man to the hours of darkness. It is of course imperative that all cases of yellow fever should be treated in buildings from which mosquitoes are religiously excluded. The human case is infective, that is the virus of the disease is present in his circulating blood, during the last day or two of the incubation period and during the first three days of fever. The incubation period of the disease is generally from two to six days.

Fortunately a very high degree of protection is afforded by inoculation with an attenuated virus. All visitors to endemic yellow-fever areas should be thus immunized.

Reference to mosquito-control measures carried out in the more important towns in the Congo is made in the section of this chapter which treats of malaria.

The sanitary organization and equipment of airfields with special regard to the prevention of spread of yellow fever are governed by an international convention. Airfields thus fully equipped are at Leopoldville, Coquilhatville, and Libenge. These airfields are all about 500 yards or more from the nearest human habitations. All have buildings for the medical inspection of passengers, motor ambulances, hospitals with isolation accommodation, laboratory facilities, disinfection and disinfecting apparatus, and a pure water-supply. There is a medical officer and an *agent-sanitaire* at each. Though not specially equipped to deal with yellow fever, the sanitary organization is almost as complete in the airfields at Boma and Elisabethville. Other authorized airfields with medical staff, hospital accommodation, and disinfection plant are to be found in Stanleyville, Banningville, and

Lisala. The airfield at Kasenyi has no special medical staff. In Ruanda-Urundi the airfield at Usumbura is listed as a 'sanitary aerodrome'.

Leptospirosis

Leptospirosis is the name given to a febrile disease caused by a microscopic parasite, *Leptospira*. Weil's Disease, which is caused by *Leptospira icterohaemorrhagiae*, is the best known and most widespread of these infections, but in different parts of the world several other varieties of leptospirosis have been discovered, caused by parasites closely allied to *L. icterohaemorrhagiae* but differing from it in certain serological and bacteriological characteristics. These diseases have been reported from all continents and from temperate and tropical countries alike. Rats constitute the most important reservoir of infection of *L. icterohaemorrhagiae*; the parasites are discharged in the urine of the infected rat. The leptospirae can live long in water. They gain entrance into the human body through normal or abraded skin or mucous membrane, or less commonly by ingestion with food. In some countries bathing in stagnant water befouled by rats involves risk of infection. Work in sewers, in muddy mines, or in swamps and ditches, in endemic areas, has its risks, as has any occupation that necessitates contact with rats. Many cases were contracted in the muddy trenches of Flanders in the last war.

The clinical diagnosis of leptospirosis is rarely easy; it is often difficult or impossible, and the laboratory technique necessary to establish the diagnosis is not simple. The disease may be confused with yellow fever, certain manifestations of malaria, blackwater fever, African tick fever or other forms of relapsing fever, dengue, or certain forms of meningitis. Its occurrence in the Congo is therefore of more than academic interest and importance. Its confusion with yellow fever has caused great difficulties in the past.

The existence of leptospirosis in the Belgian Congo has recently been established by Van Riel of the Medical Service of the *Compagnie Minière des Grands Lacs Africains*. Among the workers in the gold and tin mines of this company at Kamituga, south-west of Lake Kivu, between January 1937 and August 1940, 164 cases were diagnosed. Of these patients 152 were men, 11 women, and only 1 a child. This sex and age distribution indicates that the disease is a hazard of the industry. The men often work in muddy ground or in polluted water, and there contract infection. Of the 164 cases only 12 died. Meningeal symptoms were very frequent, there was small tendency

to haemorrhages, and relapses were rare. Laboratory research fully established the nature of the disease. In 1939 a second centre of infection was found at Butembo, to the north of Lake Kivu. The eight cases here diagnosed occurred in exactly comparable conditions to those pertaining at Kamituga. It appears probable that the dog acts as a reservoir of leptospira infection in both these places. Hitherto none of the rats examined has been found to harbour the infection.

Relapsing Fever

Relapsing fever is a disease characterized by alternate febrile and afebrile periods and is caused by the invasion of the body by a microscopic parasite called a spirochaete, which is found in the circulating blood. There are two main groups of relapsing fever. In one lice are the transmitting agents; in the other ticks are the vectors of infection. The spirochaetes causing these two varieties of relapsing fever are morphologically indistinguishable and almost certainly have a common ancestry. In the Belgian Congo tick-borne relapsing fever is the prevalent form of the disease. It is caused by *Spirochaeta duttoni*, and the tick *Ornithodorus moubata* is the transmitting agent. As long ago as 1857 David Livingstone suggested that African relapsing fever was spread by the bite of a tick, but it was not till 1905 that Dutton and Todd showed that *O. moubata* conveyed infection, and that not by its bite but by its excreta passed before the tick leaves its host.

Tick-borne relapsing fever is a place or a house disease. Ticks remain infective throughout their life and can transmit the infection to their offspring. They can remain alive for two years without food, and find shelter on the floor or ground or in walls. They do not stay on the human body.

The rat is susceptible to infection by the spirochaetes of relapsing fever. In Katanga several species of wild rodents have been found naturally infected. It is indeed possible that relapsing fever was originally a rat disease. The epidemiology of relapsing fever in the Congo can, however, be sufficiently explained without regard to the possibility of rodents playing any important part in the perpetuation of infection.

The number of cases of relapsing fever reported each year in the Congo is not very large. In 1939 there were 8 European cases and 436 native cases with 6 deaths, all from within the limits of the great tropical forest. This total was the highest for ten years. Natives

living in endemic areas appear to develop a considerable immunity against the local strain of spirochaete, an immunity which, however, does not always protect them from infection with a strain from some other locality.

Tick-borne relapsing fever is more prevalent in Ruanda-Urundi than in the Congo: reported cases in 1938 numbered 1,935 with 27 deaths, as compared with 2,270 cases and 33 deaths in 1937. The disease is more prevalent in Urundi than in Ruanda; 334 of the 1,935 cases in 1938 occurred in Usumbura. Efforts were being made to provide concrete floors for native dwellings with a view to the elimination of the tick *O. moubata*.

Smallpox

Smallpox is endemic in the Belgian Congo. The classic form of the disease occurs, as well as the much more mild form of the disease, alastrim. Aetiologically these two forms of the disease are closely related, but research work in the Congo has shown that smallpox vaccination affords very little protection against alastrim. On clinical grounds it is sometimes impossible to distinguish one disease from the other. In general it may be said that the constitutional disturbance in alastrim is remarkably slight even in cases with most extensive skin eruption; in smallpox the sufferer is much more acutely ill. In an epidemic the very low case mortality rate of alastrim is the criterion on which the diagnosis is generally based.

During 1939 there were 2 European and 6,493 native cases of smallpox and alastrim reported in the Belgian Congo, a fivefold increase on the prevalence of the previous year. Of these 299 were fatal. The distribution of these native cases was:

Province	*Alastrim*		*Smallpox*	
	Cases	*Deaths*	*Cases*	*Deaths*
Leopoldville	612	4	122	28
Lusambo	2,621	62	927	179
Coquilhatville	774	5	17	1
Stanleyville	1,050	0	6	1
Costermansville	253	2	24	12
Elisabethville	70	0	17	5
	5,380	73	1,113	226

The disease was much more fatal in Lusambo than elsewhere. In Stanleyville the prevalence was high, but only one fatal case was

reported. In Ruanda-Urundi only the mild form of the disease is reported: 67 cases with 1 death were notified in 1938.

The increased prevalence of smallpox was countered by a marked increase in the number of vaccinations performed in 1939. Controlled primary vaccinations numbered 724,621 (success rate 42%) and revaccinations 509,706. In addition, over 2 million uncontrolled revaccinations were performed. The relatively low success rate of primary vaccinations is indicative of the difficulties encountered in conserving the activity of the vaccine during prolonged tours in a hot climate. All vaccine used is made in the Congo or in Ruanda-Urundi. Vaccinations performed in Ruanda-Urundi in 1938 numbered 1,214,619.

Fevers of the Typhus Group

Fevers of the typhus group play no important part in the pathology of the Congo. In 1940 a report was published concerning 15 cases of a disease, which clinically resembled boutonneuse fever, that occurred in Manyema, a partly hot and damp region. Twelve of the patients were Europeans. None of them kept dogs, pigs, or cattle. The attacks were mild; none of the patients was dangerously ill at any time. The nature of this disease is obscure; it seems probable that it was a mild tick-borne typhus fever.

In certain regions the existence of murine typhus among the rats has been reported and is being investigated.

Several doctors have reported from time to time cases of a very mild typhus-like fever with no mortality.

Malaria

Malaria is endemic throughout the Belgian Congo except on high plateaux, 5,000 feet or more above sea-level. But the degree of endemicity varies considerably in different parts of the country. There are areas of relatively low endemicity, even in parts of the Congo basin, but such areas are not numerous. Except for the inhabitants of the high plateaux, it can be asserted that no native of the Congo escapes malaria infection. Once the dangerous process of acquiring immunity or tolerance to the malaria parasite has been successfully overcome in infancy that parasite appears to cause its native host remarkably little inconvenience in normal circumstances. It is more than probable, however, that the symptomless, afebrile, malaria infection of the native lessens his vitality and productive capacity.

The endemic malaria of the Congo has been much studied in recent years and very many papers and reports have been published, notably by Schwetz and his colleagues. It appears that in hyperendemic areas 100 per cent. of native infants are infected in the first year of life. From 2 to 5 years of age very high infection rates are commonly found, though these tend to diminish with increasing age. The number of parasites found in the blood likewise decreases. By the time adult age is reached parasites are hard to find. Prolonged search of thick-drop blood preparations may reveal their presence in 40 to 50 per cent. of adults, but the parasites are generally excessively few. In places with a relatively low degree of endemicity this evolution of infections is retarded.

The dominant species of malaria parasite is *Plasmodium falciparum*, the malignant tertian parasite: in adults it is almost exclusively found. In children of school age the quartan malaria parasite, *P. malariae*, is very commonly found, generally associated with *P. falciparum*. The benign tertian parasite, *P. vivax*, is rarely found in natives and only in young children from 1 to 4 years of age. These facts apply only to the malaria infections of the native races. The acute malaria attacks of Europeans are mostly caused by infections with *P. falciparum* and rarely by *P. vivax*. *P. malariae* infections, so common among natives, are said to be excessively rare among Europeans.

Malaria prevalence in Ruanda-Urundi does not appear to have been subjected to such detailed investigation as in most parts of the Congo. The disease is widespread and the endemicity is high, especially in areas below 3,000 feet altitude. High infection rates have been noted among populations living at much higher altitudes, even up to 6,000 feet, but in such cases infection appears to have been contracted in neighbouring valleys. A special investigation carried out in 1938 showed malaria to be hyperendemic in areas round Lake Ruhondo, in the north of Ruanda. The number of natives treated for malaria in Ruanda-Urundi in 1938 was 87,877, of whom 746 died. There were 322 European cases, of which one was fatal; 191 of the European cases were treated in Usumbura, in spite of the mosquito control work that has been carried out in that town. Usumbura has a much larger European population than any other place in the mandated territory.

Thirty-two species, and six varieties, of *Anopheles* mosquitoes have been reported from the Belgian Congo. The most widespread species are *Anopheles gambiae*, *A. funestus*, *A. moucheti*, *A. nili*, and *A. mauritianus*. *A. mauritianus*, though widespread in distribution, is

rarely found in large numbers, and has never been incriminated as a vector of malaria. The other four species are all active transmitters of the disease. *A. gambiae* is the most ubiquitous: any casual collection of water exposed to the sun serves as a breeding-place. The other three species have a preference for shaded water in which to breed. All four species frequent human dwellings. *A. funestus* is almost as widespread as *A. gambiae* and is most abundant towards the south of the Congo. *A. moucheti* is found most plentifully in the north. *A. nili* appears to be most prevalent in the Mayumbe region. In areas in which endemic malaria is most severe *A. funestus* is generally abundant. Where *A. moucheti* is most in evidence a lower-grade malaria endemicity is commonly found.

Records of the number of cases of malaria treated by medical officers are of course of little value as an index of the severity of the endemic. Even among Europeans many cases are self-treated, and it is often impossible to distinguish a fresh infection from a relapse. State medical officers treated 2,059 European cases in 1939, of which only 2 were fatal. Native cases treated by them and the medical staff of Foreami numbered 53,433, of which 214 terminated fatally.

Increasing use is being made of quinine and synthetic anti-malarial drugs as clinical prophylactics of malaria. The increasing number of native infant welfare centres are nearly all giving quinine in prophylactic doses to their infant clientele to protect them from the dangers inherent in the acquisition of that immunity which will safeguard their later years. Many of these centres report a noteworthy reduction in the mortality rates of children from 0 to 3 years of age as a result of this measure.

Anti-mosquito measures have been for the most part restricted to the more important centres of population and to certain plantations and industries. In 1939 this work included:

Leopoldville (urban district): 1,229 breeding-places of mosquitoes were abolished or controlled; of these 19 per cent. were *Anopheles* breeding-places.

Thysville: 1,996 mosquito breeding-places eliminated, of which 31 per cent. were producing *Anopheles* and 17 per cent. *Aëdes aegypti* (the yellow-fever mosquito).

Banana: 109 mosquito breeding-places destroyed; 16 were producing *Anopheles*, 13 *Aëdes aegypti.*

Boma: 420 mosquito breeding-places eliminated, of which 61 were producing *Aëdes.*

Matadi: Only 113 mosquito breeding-places were found in the urban area and 179 in the suburbs.

Coquilhatville: 1,173 mosquito breeding-places were eliminated, of which 38 were breeding *Anopheles*, 489 *Aëdes*. Of adult *Anopheles* caught in this town *A. moucheti* was most numerous; only 0·5 per cent. were *A. gambiae*. Malaria is only feebly endemic in Coquilhatville and neighbourhood.

Stanleyville: 8,496 mosquito breeding-places eliminated or controlled, 3,432 of which were producing *A. gambiae*. This species formed 63 per cent. of adult *Anopheles* caught. The house infestation rate of *A. gambiae* was only 7 per cent. in 1939 as compared with 18·6 in 1938. *A. nili* and *A. moucheti* both transmit malaria in Stanleyville, though to a less degree than *A. gambiae*. The parasite rate of schoolchildren was from 83 to 95 per cent.

Elisabethville: 8,040 mosquito breeding-places dealt with, of which 1,009 were producing *Anopheles*, mostly *A. gambiae*, and 1,020 *Aëdes*. Among adult *Anopheles* caught in houses *A. funestus* was most in evidence. Very few adult *Aëdes* were caught. There is a well-marked seasonal prevalence of malaria in Elisabethville. European cases are most numerous in April and May, the end of the rainy season; they are very rare from July to September inclusive, the cool season.

Jadotville: 1,250 breeding-places of mosquitoes were destroyed, of which 269 were *Anopheles* and 74 *Aëdes*. Of adult mosquitoes captured 22 per cent. were *Anopheles* and 1 per cent. *Aëdes*. In collaboration with the Union Minière du Haut-Katanga and the railway company some important drainage work was carried out.

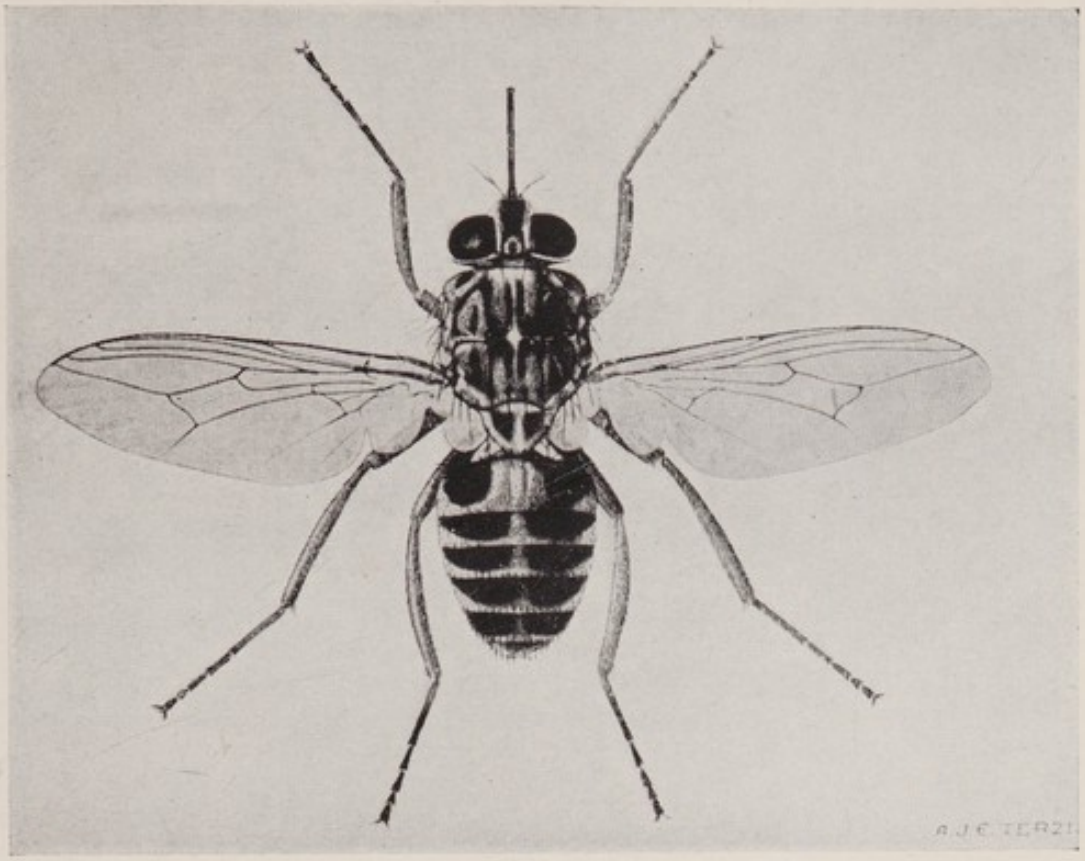
Albertville: 749 mosquito breeding-places eliminated, 74 *Anopheles* and 217 *Aëdes*. Levelling and planting river banks received attention.

Blackwater Fever

The last word on the pathogenesis of blackwater fever has not yet been written, but it is safe to assert that most cases are the sequel of pernicious malaria infections. Europeans suffer more than the native races. Native cases occur for the most part among individuals who have left the malaria-free high plateaux to work in some malarious locality. In 1939 there were 24 European cases recorded with 6 deaths. Only 15 native cases were seen; of these 2 died. One European case was reported in Ruanda-Urundi in 1938.

Trypanosomiasis (*Sleeping-sickness*) (Fig. 27; Plates 43 and 44)

Sleeping-sickness is a disease caused by the invasion of the body



43. *Tsetse fly (three to four times natural size)*



44. *Sleeping Sickness patients*



45. *Canoe dwellers at mouth of Lomami, near Isangi. The canoes are the homes of these people*



46. *Watusi. Note the anklets worn by the woman*

by a unicellular parasite called a trypanosome. The symptoms of the terminal stage of infection in which the central nervous system is involved are responsible for the name sleeping-sickness. The genus *Trypanosoma* comprises very many species parasitic in many different vertebrate hosts, from reptiles to man. The trypanosomes are conveyed from host to host by means of biting-insects. Some are carried from animal to animal, and from man to man, by tsetse-flies, *Glossinae*; they are in fact dependent on tsetse for their survival. These are the only species of trypanosomes that need concern us here. Of them three are of outstanding importance, *T. gambiense*, *T. rhodesiense*, and *T. brucei*. All three were primarily parasites of the antelope or other big game. The three species are morphologically indistinguishable, but they differ physiologically. *T. brucei* is unable to infect man; *T. gambiense* and *T. rhodesiense* do. Of the two latter *T. gambiense* has probably had a much longer association with man; it is now a true human parasite. It is responsible for most of the human trypanosomiasis in the Congo.

The tsetse-fly that is most active in the spread of the disease in the Congo is *Glossina palpalis*. A tsetse-fly may convey infection in two ways. By interrupting its meal on an individual whose blood harbours trypanosomes and passing on immediately to bite another victim, infective blood on the fly's proboscis may infect the second victim. Such direct transmission is probably very unusual and is only likely to be operative when trypanosomes are unusually numerous in the peripheral blood. The indirect, or cyclical, method of transmission is much more important. In this the trypanosomes undergo a cycle of development in the alimentary canal of the fly, and after an interval of from 10 to 25 days small forms of the trypanosome, metacyclic forms, find their way to the salivary glands of the fly. These are the infective forms of the parasite. Until the glands are infected the fly is incapable of transmitting the disease; when they are infected the fly is capable of infecting every susceptible individual it may bite.

High temperatures and high humidity are indispensable to the tsetse-fly's existence. Its distribution is thus confined to the immediate vicinity of water with vegetation sufficiently thick to protect the fly from the sun's rays. The tsetse is viviparous, the larvae boring their way into loose sand or soil near the shaded watercourse. The adult flies do not range far from their breeding-places.

In the first quarter of the present century sleeping-sickness constituted much the most serious menace to the health and even to the

existence of the native populations of the Belgian Congo. Thanks to most praiseworthy sustained medical effort, the disease no longer ranks among the most prevalent causes of invalidity and premature death, but severe epidemics would almost certainly recur were vigilance to be relaxed. The populations of infected areas are kept under constant observation. Some idea of the immensity of the work involved, as well as of the declining prevalence of the disease, is furnished in the following tables:

Sleeping-sickness Activity in the Belgian Congo

Year	*Natives examined*	*Old cases under control*	*New cases*	*Index of new infections*
1930	2,779,448	70,423	33,562	1·20%
1931	2,685,768	67,272	25,582	0·95
1932	2,832,083	77,268	21,346	0·75
1933	3,572,438	93,954	27,939	0·78
1934	3,824,097	86,147	24,101	0·63
1935	4,356,270	66,774	18,930	0·43
1936	5,282,646	53,429	18,708	0·36
1937	5,034,442	50,980	14,921	0·29
1938	5,034,331	45,785	13,454	0·27
1939	5,216,841	40,510	12,886	0·25

Distribution of Sleeping-sickness Cases in 1939

Province	*Natives examined*	*New cases*	*Old cases*	*Total cases treated*	*Index of new infections*
Leopoldville .	1,075,097	2,767	6,636	9,403	0·26%
Lusambo . .	891,938	3,628	14,340	17,968	0·41
Coquilhatville .	921,801	1,557	6,135	7,692	0·17
Stanleyville .	680,849	240	1,352	1,592	0·03
Costermansville .	618,700	1,563	5,919	7,482	0·25
Elisabethville .	429,458	781	2,255	3,036	0·18
Foreami . .	598,998	2,350	3,873	6,223	0·38
Congo . .	5,216,841	12,886	40,510	53,396	0·25

The accompanying map is reproduced from the Annual Public Health Report of the Belgian Congo for 1939. It indicates the distribution of the principal foci of sleeping-sickness. It will be noted that very large areas are almost completely free from the disease.

In the Leopoldville province active centres of infection still existed near Boma, along the Congo from Maluku to Bolobo, along the Kasai (Mushie), and in the middle Wamba area. In collaboration

with French authorities an exhaustive study was made of the riverain populations of the Chenal. This was followed by the prophylactic treatment of the population on the Belgian side of the river with Bayer 205. Similar prophylactic medication was also carried out in the Mushie area.

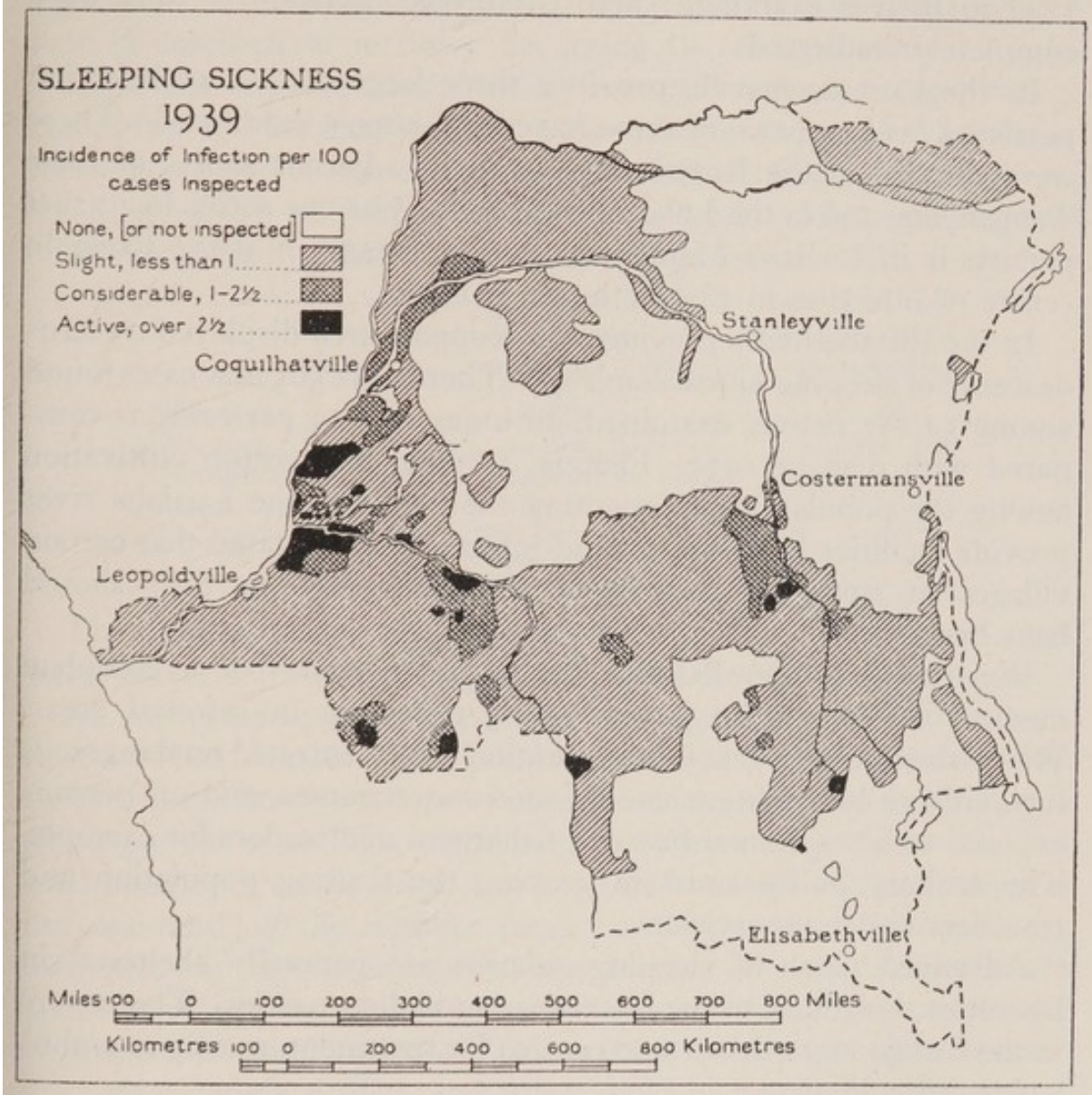


FIG. 27. *Sleeping-sickness Areas*

In the Lusambo province the principal centre of infection was to the south-east of Luluabourg. The index of new infections in this province was less than half the index for 1933.

In the Coquilhatville province there has been very marked improvement; the new infection rate fell from 0·68 in 1933 to 0·17 per cent. in 1939. The disease, however, persisted along the Congo, on the shores of Lake Tumba, near the mouths of the chief tributaries

of the Congo, and in certain inhabited islands. These foci are important by reason of the extent of native traffic.

In the Stanleyville province the new infection rate was very low. Active centres of infection persisted at Ango and Gwane (Uele). In the Lake Albert area not a single new case was discovered among 124,630 natives examined; here the disease appears to have been completely eradicated.

In the Costermansville province three large centres of infection persisted for long; two of these have been almost eradicated. These were situated in the Ruzizi valley and the adjacent shores of Lake Tanganyika, and in the Lake Edward area. The one active focus that persists is in Lualaba-Manyema. It is an extension of the Kongolo centre of infection in Elisabethville province.

In the Elisabethville province the Kongolo area displayed a recrudescence of sleeping-sickness in 1939. There were 505 new cases found among 54,281 natives examined, an index of 0·93 per cent. as compared with 0·20 in 1935. Fishing, trading, and cotton cultivation among the populations frequenting the banks of the Lualaba river provide facilities for the spread of infection. It is stated that certain villages in tsetse-fly areas were not maintained as they should have been.

Experience in the Belgian Congo has shown that a complete medical census of the population is necessary in infected areas. Where the infection rate is low attention is concentrated on dangerous foci, villages bordering tsetse-infested watercourses, and on persons exposed to occupational hazards, fishermen and traders for example. The sanitary police assist in keeping the floating population and travellers under supervision.

Advanced cases of sleeping-sickness are generally sheltered in lazarettos, hospitals, or pavilions near rural dispensaries. There were in the Congo more than 1,400 centres for treatment, mostly as ambulatory cases, in 1939.

In the diagnosis of cases gland palpation and gland puncture are an important part of the clinical examination, but more importance is now being attached to the microscopic examination of stained thick drop blood preparations.

Certain strains of *T. gambiense* are resistant to arsenic, and this phenomenon appears to be more widespread in the Congo than was at one time thought. In the treatment of persons infected with these strains belganyl, the Belgian equivalent of germanine, in association with antimony preparations, has been used with great success.

Certain domestic or wild animals may act as reservoirs of sleeping-sickness virus in the Congo. This possibility is the subject of laboratory research, as is the spontaneous change in the virulence and pathogenicity of trypanosomes that has been sometimes observed.

In Ruanda-Urundi, as in the Congo, there has been a remarkable regression in the incidence of sleeping-sickness. The contaminated area is confined to territory bordering the eastern shore of Lake Tanganyika and the Ruzizi valley. A special control organization consisting of 2 medical officers, 4 *agents-sanitaires*, and subordinate native personnel examined the whole population of the infected areas, totalling 79,723, on four occasions during 1938. Only 117 new cases were discovered. Their distribution was as follows:

Area	*Population examined*	*New cases*	*Index of new infections*
Nyanza-lac . .	6,832	4	0·05%
Rumonge . . .	12,087	1	0·008
Usumbura . . .	44,080	28	0·06
Bugarama . . .	16,724	84	0·5
TOTAL . .	79,723	117	0·15

The indices of new infections for each of the years 1930 to 1938 were: 4·1, 1·08, 2·5, 1·3, 0·59, 0·46, 0·45, 0·20, and 0·15.

All suspected cases were examined by gland puncture and sometimes by blood examination. Lumbar puncture and examination of the cerebrospinal fluid was done as occasion demanded. In 1938, 34,576 gland punctures and 705 blood examinations were performed. The total number of cases, old and new, treated in 1938 was 424, which is but one-tenth of the number treated in 1930: 52 of these patients died, many of them from intercurrent diseases. Only patients who are seriously ill are admitted to hospitals: there were 29 admitted to the Usumbura hospital and 5 to the lazaret at Rumonge. Sixteen were discharged cured, 9 died, and 9 remained in hospital at the end of the year.

Land that was evacuated on account of sleeping-sickness on the eastern bank of Lake Tanganyika was partially reoccupied without untoward incident. The clearing of scrub near villages, at river crossings, &c., continued to receive attention.

Venereal Diseases

The number of cases of syphilis among the native population treated year by year tends to increase, but this increase appears to be

indicative of the intensification of medical activity rather than of increased prevalence. Cases treated in 1939 numbered: Leopoldville 3,419; Lusambo 19,539; Coquilhatville 21,116; Stanleyville 21,798; Costermansville 6,590; Elisabethville 9,650; Foreami 67. The total for the Congo was 82,179. In 1938 there were 2,602 cases treated in Ruanda-Urundi. In the provinces of Stanleyville and Coquilhatville and in certain industrial areas of Costermansville syphilis is an important cause of low birth-rates. In these areas special efforts were made to seek out cases. Natives returning from mines and plantations spread infection. The tendency of the native to cease treatment as soon as the external lesions of the disease have disappeared, a tendency shared by much more advanced races, is the cause of great difficulty. Investigations carried out by the Coquilhatville laboratory have shown that insufficiently treated syphilis plays an important role in the causation of family decadence and individual incapacity. Treatment is compulsory: failure to submit to treatment is punishable by imprisonment, but this penalty is rarely imposed.

The anti-venereal service of the Congo Red Cross Society in the town of Leopoldville discovered 612 fresh cases of syphilis, or 6·8 per cent. among 8,927 natives examined. The corresponding percentage for similar work done in 1934 was 28. In several towns in which ample facilities for treatment exist a noteworthy decline in the incidence of syphilis has been noted.

Gonorrhoea is very widespread and its prevalence is increasing. The number of native cases treated in 1939 was 31,724. This figure is an inadequate index of prevalence. Of 14,584 natives examined in the outskirts of Elisabethville 6·9 per cent. suffered from gonorrhoea. In certain rural areas in Uele, Kasai, and Sankuru, and in the north of Ubangi, this disease is of recent introduction and is much more prevalent than in the Elisabethville neighbourhood. The medical services of Ruanda-Urundi treated 6,079 cases of gonorrhoea in 1938.

Yaws

Yaws, sometimes called Pian or Framboesia, is a very widespread, contagious, chronic disease of the tropics that seems to flourish best in countries with heavy rainfall and dense tropical vegetation. It is caused by a parasite, *Treponema pertenue*, which is closely related to, and morphologically indistinguishable from, *Treponema pallidum*, the cause of syphilis. But yaws is not a venereal disease as is syphilis. Infection is acquired through skin abrasions by direct contact with sufferers from the disease, and the primary sore is generally on some

exposed part of the body. In the West Indies a fly commonly acts as a vector of infection. No insects have as yet been found to play a similar role in Africa. Most cases of yaws tend to spontaneous cure, but considerable scarring and disfigurement may be left. Yaws is very readily curable with anti-syphilitic remedies or with bismuth salicylate. It is pre-eminently a disease of childhood.

Yaws is widespread in the Congo. Cases treated during 1939 numbered 316,220, distributed in the different provinces as follows: Leopoldville 18,470; Lusambo 15,469; Coquilhatville 76,682; Stanleyville 59,936; Costermansville 136,045; Elisabethville 7,693; treated by Foreami 1,925. The Foreami report for 1938 calls attention to the very unequal distribution of the disease. Among the Bapende, for example, the disease is almost unknown, whereas among the Bangongo the disease is very prevalent. The Bapende have frequent contact with infected areas and their manner of life exhibits no less promiscuity than does that of the Bangongo. No explanation of this unequal distribution is forthcoming; it would seem to lend some support to the possibility of an insect vector playing an active part in the transmission of yaws.

In areas in which the medical service has displayed much activity in combating yaws there has been a marked and rapid fall in the incidence of the disease, and the frequency of tropical ulcers likewise diminishes. In a country such as the Congo, in which medical assistance is well organized and relatively accessible to the vast majority of the population, yaws is not a serious menace to the public health: it is so amenable to treatment. Treatment has to be complete, however, otherwise relapses are apt to occur. But the arsenical remedies used in treatment are somewhat costly. Neoarsphenamine is the drug most commonly used in the Congo.

Yaws is a very uncommon disease among Europeans; no case was reported in the Congo in 1939.

Yaws is the most widespread of the endemic diseases of Ruanda-Urundi; 150,146 cases were treated in 1938. Travelling units found an incidence of yaws amounting to 1·44 per cent. of the total population enumerated in Urundi and 2·22 in Ruanda. As in the Congo, a noteworthy decline in the incidence of yaws has been noted wherever facilities for the treatment of the disease have existed for a number of years.

Leprosy

Leprosy is widely distributed in the Congo. During 1939 six

European cases were diagnosed. The number of native cases treated during that year was:

Cases treated by	*Province*						*Total*
	Leo.	*Lus.*	*Coq.*	*Stan.*	*Cost.*	*Elisa.*	
Govt. hospitals and dispensaries	66	84	449	343	152	118	1,212
Govt. itinerant services	1,724	6,958	23,786	8,506	6,859	1,710	49,543
Rural dispensaries	..	265	656	1,848	2,965	632	6,366
National missions	586	2,290	3,755	1,836	70	417	8,954
Foreign missions	270	1,795	504	1,378	1,444	561	5,952
Philanthropic organizations	170	..	1	2,032	134	..	2,337
Private enterprises	4	17	..	..	3	9	33
TOTAL	2,820	11,409	29,151	15,943	11,627	3,447	74,397
Foreami	..	..	..	..	..	..	1,789
							76,186

More extended surveys carried out under the impulsion of a new organization devoted to the campaign against leprosy, the Father Damien Foundation, led to the discovery, in 1939, of some 10,000 cases that had not been treated. The majority of these cases were in the provinces of Coquilhatville, Costermansville, and Elisabethville.

Increased attention has been paid to leprosy by the Health Administration in recent years. Very contagious cases are now isolated whenever circumstances permit. Cases that are most likely to respond to treatment receive most clinical attention. The idea of segregation is beginning to be looked upon with less aversion than formerly by the native. In those communities in which segregation has been relatively well carried out a definite decline in the infection rate has been noted. Segregation in villages specially designed for the purpose appears to offer the best solution. Such villages should not have populations exceeding 400. They should have as much agricultural land as the community can work. Each should have a dispensary and a nurse. They should be as self-supporting as possible. Such are the desiderata formulated by the Health Department. It would appear that only in the province of Stanleyville has the installation of lepers in such agricultural villages made much progress. Here there were, at the end of 1939, 103 such villages sheltering 14,988 lepers. In the other provinces the number of leper asylums and segregation camps in 1939 was as follows: the figures in parentheses represent the number of inmates at the end of that year: Leopoldville 16 (559); Lusambo 10 (1,548); Coquilhatville 4 (302);

Costermansville 5 (922); Elisabethville 2 (125). The total number of lepers in isolation in the Congo was 18,444.

In Ruanda-Urundi 1,561 lepers were discovered in 1938: 855 of these were found by travelling medical units. The incidence of leprosy over the whole territory is about 0·54 per cent. of the population.

Tuberculosis

Tuberculin reaction tests that have been carried out in different parts of the Congo indicate that tuberculosis infection is becoming more widely diffused among the native races, especially in the western provinces, but the disease is not considered to be a serious menace. The resistance of the black races of the Congo to the tubercle bacillus appears to be considerable, provided that they are not submitted to massive infection. The European sufferer from tuberculosis constitutes a great danger to his servants or other native employees, and it is among this class of native that fulminating cases of tuberculosis are most commonly seen. The highest proportion of positive tuberculin reactions is found among natives who have dwelt longest in urban communities. In Leopoldville 49 per cent. of adult native workers resident in that town gave a positive reaction.

The total number of tuberculosis cases discovered by all the medical organizations in the Congo in 1939 was 3,549. There were 335 deaths ascribed to tuberculosis in government medical institutions. These figures are not large in comparison with total morbidity figures. In several provinces there are segregation camps and asylums for tuberculosis patients.

In Ruanda-Urundi tuberculosis figures more largely in morbidity statistics year by year. In 1938 there were 1,008 cases (798 pulmonary) and 70 deaths.

Typhoid and Paratyphoid Fevers

Sporadic cases of typhoid and paratyphoid fevers are reported from time to time from all parts of the Belgian Congo, but their number is not large. In 1939 there were 11 European cases with 2 deaths and 89 native cases with 15 deaths. The number of cases was higher than in any of the ten previous years. Typhoid infections are more common than paratyphoid. The only outbreak of any importance recorded in 1939 was in the province of Stanleyville, where the Bafwaboli Mining Company reported 32 cases and 2 deaths.

In Ruanda-Urundi 37 cases of typhoid fever with 13 deaths were reported in 1938. Such a high case-mortality rate indicates that only very serious cases were notified. Most of the cases occurred in the neighbourhood of Nyundo, a few miles from Kisenyi in Ruanda.

Bacillary Dysentery

Seventeen European cases were recorded in 1939, of which 12 were in the province of Leopoldville. Native cases numbered 694, of which 61 were fatal. Of these, 600 cases and 39 deaths were reported from the province of Costermansville, where there was an epidemic in the Lubero and Beni territories. The Shiga dysentery bacillus was responsible for this outbreak. The low case-mortality rate, 6 per cent. of the 309 patients treated in hospitals, was attributed to the fact that the afflicted populations had been previously vaccinated against dysentery. The anatoxin used for these vaccinations is prepared in Leopoldville.

Amoebic Dysentery

Amoebic dysentery is more common than the bacillary form of the disease. In 1939 there were 186 European cases notified; all recovered. Native cases numbered 3,879, of which 76 were fatal. This case-mortality rate, 1·96 per cent., is lower than in any previous year, probably an indication of more effective treatment. A new synthetic product, paramibe, was used with success. Half the total cases of amoebic dysentery occurred in the province of Coquilhatville, mostly in the capital and its neighbourhood; attention was being paid to improving the sanitation of that town. A persistent focus of infection at Basoko was responsible for 215 cases and 7 deaths. The native town of Costermansville and its camps and prison also constitute a very active focus of infection.

Amoebic dysentery was responsible for 2,274 cases and 59 deaths in Ruanda-Urundi in 1938. There were in addition 20 cases among Europeans, 18 of which occurred in Usumbura.

Cerebrospinal Meningitis

Sporadic cases of cerebrospinal meningitis are reported from all the provinces of the Congo, but large-scale epidemic manifestations are rare. In December 1937 a considerable outbreak began in the Faradje area of the Stanleyville province near the Uganda frontier. There were 215 cases and 119 deaths. In this neighbourhood the disease persists and has spread to Aba and Aru. Outbreaks are also

reported from the gold-mining areas at Watsa and at Kilo. Vaccination with local strains of the meningococcus has been used in these areas. Recently the use of sulphanilamide preparations in the treatment of cases has been attended with success; a recovery rate of 79 per cent. has been reported among cases so treated. The distribution of cases of cerebrospinal meningitis reported in 1939 was:

Province	*Cases*	*Deaths*
Leopoldville . . .	20	12
Lusambo . . .	11	7
Coquilhatville . . .	5	3
Stanleyville . . .	241	83
Costermansville . .	22	7
Elisabethville . . .	18	5
TOTALS . . .	317	117

In Ruanda-Urundi there was an epidemic of cerebrospinal meningitis in 1936, reaching its height in October of that year; 294 cases were notified in that month. During 1937 and 1938 cases were sporadic in character and occurred at all seasons of the year. The total number of cases reported in 1938 was 203. The vaccination of the populations near centres of infection with a vaccine prepared from local strains of the meningococcus has apparently conferred considerable protection.

Helminthiasis

The vast majority of the native populations of the Congo harbour an assortment of intestinal worm parasites. Often these seem to cause but little inconvenience to their hosts, but it is probable that the standard of health would be very considerably raised could they be eliminated. The intensity of infection can only be determined by the examination of the excreta of large samples of the population. Cases seen in hospitals and dispensaries constitute a very small proportion of the number of persons infected. In 1939 the State medical services treated 40,409 cases of hookworm disease, of which 38 died, and 49,071 other helminth infections, of which 16 died. In the same year Foreami reported 28,392 cases of hookworm disease with 61 deaths and 24,336 other helminth infections with 9 deaths. There were also 41 European cases of hookworm disease and 334 Europeans with some other form of worm infection.

Ankylostomiasis, or hookworm disease, is by far the most important of these intestinal helminth infections. The hookworm responsible

in the Congo, as in other parts of tropical Africa, is *Necator americanus*. In many parts of the country the whole population is infected, but for the most part infections are not heavy and cases presenting the severe anaemia and other classical symptoms of ankylostomiasis are not frequent.

The small adult hookworm, less than half an inch in length, is found attached to the gut wall of the upper part of the small intestine where it sucks blood and possibly produces a toxin. The eggs leave the body with the excreta. The larvae which emerge from the eggs remain in damp soil where, after undergoing a certain development, they are capable of penetrating the skin of man, generally the thin skin around the ankles. In doing so the larvae cause an inflammatory reaction of the skin, known in different parts of the world as 'ground itch', 'coolie itch', or 'dew itch'. All this means that infection is generally contracted by walking unshod on ground contaminated with human excrement. From the skin of the ankle the hookworm larva undertakes an adventurous journey by lymph spaces or blood capillaries to the veins, and thence through the heart to the lungs. Travelling from the lungs up the trachea the larva is swallowed and in the small intestine it attains maturity, and the cycle soon begins all over again.

Drug treatment can rid the body of its hookworms, but reinfection will almost certainly take place until such time as the installation of sanitary latrines and a fundamental change in the habits of the people make possible the prevention of gross contamination of the soil in the vicinity of human habitations. That time is not yet. Fortunately the human body can tolerate the presence of a certain number of these dangerous parasites without suffering from obvious ill effects, though it is probable that even light infections may render the host more susceptible to intestinal infections of many kinds. Eliminating such light infections may result in a well-marked increase in productive capacity and engender a sense of well-being such as the victim has never before experienced. Heavy infections produce clinically recognizable ankylostomiasis, anaemia, oedema, and fever. Such cases are said to be relatively rare in the Congo.

In certain parts of the Congo, notably near its eastern frontier, the incidence of hookworm infections appears to be much less intense than elsewhere. Here the round worm, *Ascaris lumbricoides*, is very prevalent. Tape worms and *Trichuris* are both frequently found.

In Ruanda-Urundi 88,674 patients were treated in 1938 for intestinal worm infections: of these 6,327 harboured ankylostomes,

14,003 *taenia* or tape worm, 27,123 *ascaris*, and 8,883 *tricocephalus*. Ankylostomes were responsible for 13 deaths.

Schistosomiasis

Schistosomiasis, or bilharziosis, is a disease caused by the invasion of the body by a trematode worm, *Schistosoma*. There are two forms of the disease in the Belgian Congo, the vesical form caused by *S. haematobium* and a rectal form caused by *S. mansoni*. The eggs of the worm reach the exterior in the urine, in the case of *S. haematobium*, or in the faeces, *S. mansoni*. If the eggs are deposited in water the enclosed embryos rupture the shells. The ciliated embryo that emerges is called a *miracidium*. It swims about till it encounters certain species of freshwater snail, in the body of which further development takes place. Developmental forms, *cercariae*, later escape from the snail into the water, and are able to penetrate the skin of man, whence they travel to their site of election, *S. haematobium* to the bladder and *S. mansoni* to the intestinal tract. There they attain maturity in about six weeks; thereafter the females commence to produce their characteristic eggs.

The symptoms of the disease may be distressing, but many individuals harbour these parasites without suffering inconvenience. The number of cases treated affords no indication of the intensity of infection. In 1939 there were 19 European and 5,703 native cases of the rectal form of the disease treated; 42 of the latter died. Of the vesical form 25 European and 154 native cases were reported. The vesical cases occurred near certain streams in Bas-Congo, in the Kongolo area, and in the neighbourhood of Elisabethville. *S. mansoni* infections are most numerous in the province of Stanleyville, near Lake Albert, along the Lubilash, near Lake Tanganyika, and in Haut-Katanga. The disease appears to be common all along the eastern border of the Congo. Very high infection rates have been noted at Irumu and Bunia in the upper Ituri region, in the Kilo mining area, and on the shores of the bay of Bobandana, Lake Kivu. In the Kasenyi plateau, Lake Albert, as many as 65 per cent. of the population were found to harbour *S. mansoni*. On the other hand, schistosomiasis is endemic nowhere in the Kwango district.

In Ruanda-Urundi 210 *S. mansoni* infections were treated in 1938.

Infection is probably contracted by walking in the muddy stagnant water of rivers and streams to fish, or by washing in or drinking the water. The intermediate host of *S. mansoni* is a snail of the genus *Planorbis*. Six species of *Planorbis* have been reported from places

between Lake Kivu in the south and the upper Ituri and Lake Albert in the north. Among these *P. adowensis* can certainly transmit schistosomiasis; it is possible that other species may do likewise. Until more information is available concerning the intermediate host the only prophylactic measure possible is treatment of the infected; this will not, however, prevent reinfection. The difficult problems involved have recently been the subject of some interesting research.

Deficiency Diseases

There would seem to be no doubt that the diet of a large proportion of the black population of the Congo is at times insufficient and at most times deficient in certain ingredients essential to health. An insufficiency of animal protein in the diet is frequently mentioned. There are references in the literature to the poor mineral content of the soil in which the food is grown. The calcium content of Congo foods—sweet potatoes, maize, manioc, beans, and bananas—is said to be markedly lower than the calcium content of these foods grown elsewhere. It can be asserted that dietetic deficiencies are a potent cause of ill health. The various attempts that have been made to improve and supplement the diet in many areas have generally been followed by increased fecundity and lowered morbidity and mortality rates. But much more investigation is required before any just assessment can be made of the importance of nutritional factors in disease causation in the Congo. There is sometimes a tendency on insufficient evidence to ascribe to diet deficiency the chief role in the causation of pathological conditions the exact nature of which is still obscure.

It is perhaps surprising that health reports contain no reference to rickets and scurvy. Cases of pellagra, or of a pellagra-like condition, have been reported. Beri-beri occurs, but the number of cases reported annually is small; in 1939 only 55 cases were treated, of which 2 died. Other diseases caused by vitamin deficiency were more prevalent; 434 cases with 31 deaths were reported by the State medical service and 1,752 with 80 deaths by Foreami. The majority of these cases appear to have been of the nature of the depigmentation-oedema syndrome described below.

Depigmentation-Oedema Syndrome. This condition appears to be widespread in the Belgian Congo. It is characterized by oedema, beginning in the lower extremities, weakness, anaemia, depigmentation of the skin, which becomes dull, dry, rough, and scaly, depigmentation of the hair, peri-articular rheumatic pains, myocarditis,

and digestive troubles. Loss of appetite is an early symptom. The taking of food may excite diarrhoea. In the later stages the abdomen enlarges, the face is swollen and puffy, and the hair becomes less and less pigmented. In fatal cases diarrhoea may be uncontrollable before the end. The multiplicity of native names for this dreaded complaint is indicative of its wide prevalence. Among these names are *Nbwagi* or *Buaki*, *Kikuba*, *Kibengi* (*benga*, to grow white), *Diboba*, *Ditoka* (*kutoka*, to grow white).

Cases of this disease in some parts of the Congo are not very often brought to dispensaries, possibly because of doubts as to the capacity of medicine providing a cure, but travelling medical units see a great deal of it in the villages. G. Pieraerts, working in the Kasai district, has recently published the results of a study of diboba. He noted a certain seasonal periodicity of the disease. From January to September only sporadic cases are seen, and these seem to be manifestations of destitution; men, women, or children may be affected. In September diboba may become epidemic; then children of all ages from weaning to puberty are the chief sufferers. Adult men and sucklings are practically never affected, and women but rarely. No longer is the disease confined to the most destitute members of the community.

Manioc forms the basis of the diet. To make a reasonable bread, maize or millet, in the proportion of about one-third, is added to the manioc, when either of these grains is available. Manioc contains but little protein and is very deficient as a food in other respects. Maize is harvested in December, millet in April and May. The latter harvest is rarely sufficient, and by July granaries are commonly empty. Thereafter till the end of the year bread may be composed of manioc alone. Diboba may be the result. Most observers believe that vitamin deficiency, particularly of vitamin C, is the root cause of this disease, but the condition does not respond to the administration of vitamins alone. Some consider that a deficiency in iron is one of the most potent defects of a deficient diet in the causation of diboba. Certain it is that an unequilibrated diet is the precursor of all cases, and that a generous diet, rich in animal protein and vitamins, is the most important factor in successful treatment. The administration of iron hastens recovery, and drugs should be given to free the victims from the hookworms that most of them harbour.

A condition analogous to diboba is seen in French Indo-China, where it is known as *la bouffisure d'Annam*. Certain authors have described it as being a manifestation of hookworm disease. Though

nearly all the Congo sufferers from the depigmentation-oedema syndrome harbour some hookworms, freeing them from hookworms is never sufficient in itself to effect a cure.

Epidemic Spastic Paraplegia. Food deficiency is probably responsible for a disease that was first described in 1936 among the inhabitants of the Kwango district and studied by the doctors of Foreami. It has been called epidemic spastic paraplegia; the natives call it *Konzo*. The disease bears a resemblance to the A and B avitaminosis of Nigeria and the 'central neuritis' of Jamaica. Adults are sometimes affected, but children under 10 years of age are the most frequent victims. The onset of the disease is generally sudden with headache and backache, paraesthesia, formication, and paresis, or paralysis, which is eventually of the spastic type. There is wasting of the muscles, and sometimes disturbance of speech. Occasionally there is blindness. It is rarely fatal, but the patients are permanently disabled.

The diet of the Kwango people is certainly varied if not nutritious; it is said to consist among other ingredients of ground-nuts, fungi, sugar-cane, ants, caterpillars, rats, monkeys, and palm oil. Manioc, sweet potato, and millets are cultivated. The better-off members of the community appear to be more liable to the disease than the poorer. It is not uncommon for more than one member of a family to be attacked.

CHAPTER VII

THE PEOPLE

The Men

The Races (Figs. 1 and 46)

The Belgian Congo is mainly the bed of an ancient inland sea. When it had drained to the Atlantic, and rain-forest had taken its place, the first colonists, of existing races, were hairy, dwarf, yellow men whom we call Pygmies. Tradition and folk-lore and glimpses of history tell us that they were once widespread throughout north-central Africa, but they are now reduced to scattered groups within the confines of the equatorial forest.

After the Pygmies came those invaders who are supposed to have entered Africa, from Asia, across the straits of Bab el Mandeb, or thereabouts. The first to arrive, probably in several waves and before any recorded history, were the black-skinned curly haired peoples, all of whom are generally known to the untravelled as negroes. To any who know their Africa they are fairly sharply divided into Negroes and Bantus. The latter term, linguistic rather than racial, applies particularly to the long-limbed fighting tribes of the east and south-east of Africa. These peoples show many of the characteristics, both physical and cultural, of the next, Hamitic, waves of invasion which will be mentioned below. They speak dialects of that Bantu language which is also spoken, however, by the inhabitants of the Congo, but these latter, with whom we are now concerned, show much fewer traces of Hamitic blood, and are in fact almost akin to the negroes of the Guinea coast. The Congo forest Bantu, the shortest of his linguistic group, hampered by his environment, by malnutrition, and by malaria, sleeping-sickness, and other forest and swamp diseases, has less vitality, less of the normal African gaiety, than his happier kinsmen of the plains and uplands.

Hamitic invaders, next to cross the straits of Bab el Mandeb but also before recorded history, are an unmistakably different people, whose dominant character allowed an easy and often bloodless conquest. They are taller, slenderer, lighter in colour, and were better armed than the negroes. Some of these cattle owners (or *Watusi* in the Bantu vernacular) are to be found as overlords in Ruanda-Urundi.

The Bahima are one of their well-known tribes. In proportion as their blood has modified the original negroes, so does stature grow, and cattle-owning supplant agriculture.

In the north-east country of the Haut-Uele a slightly different type is to be found in the Azande, who speak a negro dialect and who have come from equatorial Nile provinces.

The latest arrivals, well into the period of recorded history, are the Arabs, who came as traders, mostly in black or white ivory. Their blood and religion (Islam), both greatly diluted, linger on in swarthy descendants, whilst their language, the medium of instruction in Moslem schools, has so modified and enriched the Bantu speech of the eastern seaports as to have given central Africa its lingua franca 'Swahili'.

At the close of the fifteenth century the Portuguese discovered the mouth of the Congo and began to exploit equatorial African resources, slaves, ivory, and oils, through the African middleman of the coast. The Congo basin remained a closed book to Europeans till Stanley found his way down the Congo in 1877. In 1885 the Congo Free State was founded and European development began.

Pygmies (Figs. 1 and 28)

The depths of the forest are inhabited by Pygmies, who are skilled only in hunting. They live in small nomad groups and build little round shelters of branches, rather than huts, on the ground or in forks of trees. The men average about 4 ft. 4 in. in height, the women just under 4 feet. They have characteristically bulging eyes, a perfectly flat nose, long upper lip, retreating chin, and a tendency to the growth of light-coloured downy hair on the body and of reddish hair on the head. The Pygmies are found in the regions of the upper Ubangi and Aruwimi (where they are called Aka and Tiki-Tiki), in the Ituri forest and along the Rift valley, in central Congoland, and in the forest regions of the Sankuru-Kasai basin (where they are called Batwa and by other names). In spite of their primitive habits, they have some dealings with the forest Bantu. When their hunting has been good they put portions of the meat at places mutually agreed on. The Bantu take the meat and lay down bananas, cassava, and possibly a pot or a lance-head, in exchange. The development of trade throughout the colony has not induced the Pygmies to alter their way of life. They remain as they have been for centuries—perhaps for thousands of years.

Bantu

General. In those dialects of Bantu, used within the Congo basin, the plural is formed by prefixing the syllable *Ba.* We find tribes called the Bakongo, Balunda, Baluba, and so on. Another common

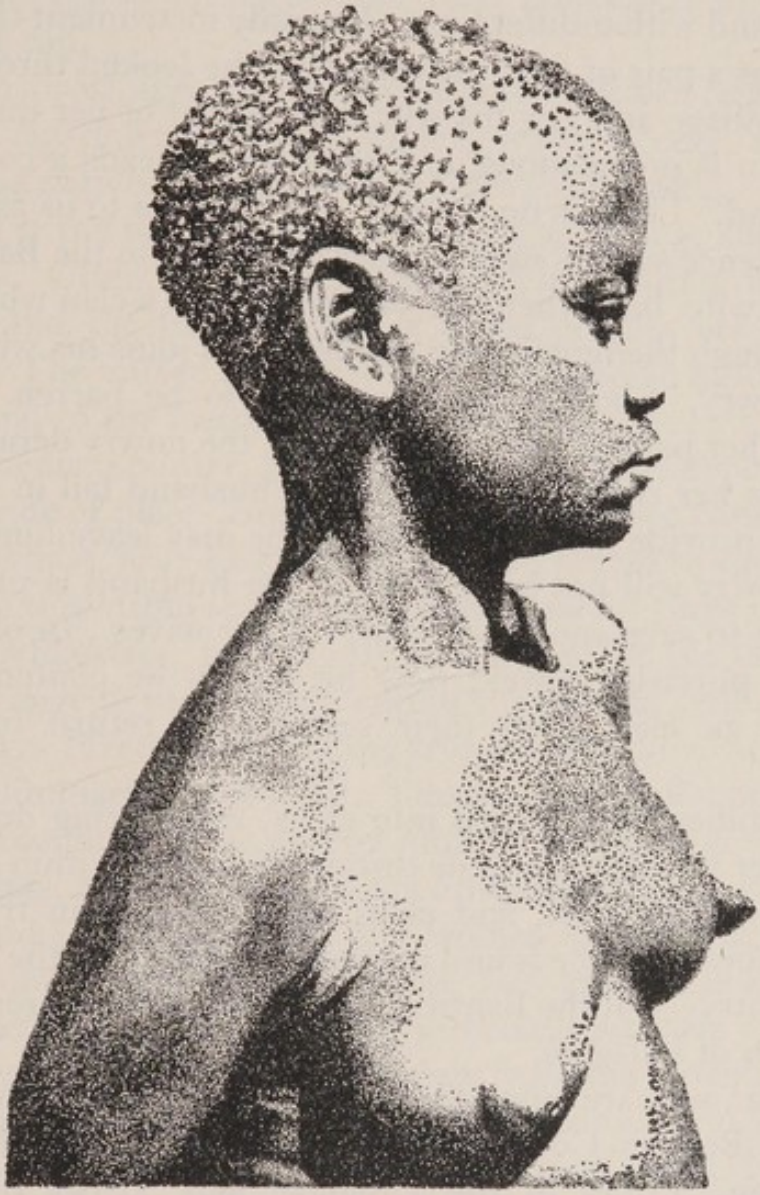


FIG. 28. *Pygmy Girl*

feature is that the word for 'man' is *muntu.* Hence Bantu means 'the men', and, naturally, the men who speak that language.

The Bantu are a collection of kindred peoples rather than a race. Physically they vary a good deal. Some have round, others long heads; some are short, others tall. In their general appearance they are negroes, but the negro of the west coast of Africa has crisper hair, more prominent jaws, flatter nose, thicker lips, and sometimes darker skin. It is difficult to generalize about their character, but at

bottom it does not differ greatly from the negro's. They are intelligent, naïve, practical, clannish, conservative, and inclined to work by fits and starts but capable of good service. Through lack of contact with the outside world they have until recent times been steeped in superstition and accept modern inventions without comprehension and with indifference. The only instrument that surprised one chief was a pair of field-glasses, when he looked through these at his distant village and saw his wife coming out of her hut.

The Bantu is polygamous, and each family leads a communal life under its head. There is no privacy, and it seems to us as uncomfortable an existence as ours must appear unnatural to the Bantu. Dowry is paid for a wife, but, when the wife belongs to a clan which traces its descent through the female line, the husband joins his wife's clan and pays no dowry. Should the wife prove to be barren she may be returned to her parents and repayment of the dowry demanded, but a wife also has her rights, and should the husband fail in his duty, for instance, to provide her with clothing, she may leave him and, in this case, the dowry will not be repaid. If the husband is prosperous he may be able to save enough to marry other wives. In olden days he would also purchase slaves: now he has to be content with such dependants as may offer their services in return for food and lodging.

Bantu families are grouped into clans, recognizing descent in one line (whether through males or through females) within which intermarriage is not allowed, and clans are combined in tribes. A few powerful tribes are to be found in the south-east— in the Balunda and Baluba country—but the Bantu of the Belgian Congo are, in the main, a population of villagers.

The Bantu, who are much the most numerous section of the population of the Belgian Congo, may be subdivided into Tribes of the Congo Basin, Tribes of the Uplands, and Tribes of the Coast. Naturally this division is arbitrary and means little in the way of race. On the uplands there are pure Hamitics and much diffused Hamitic blood, in the forest there may be admixture with the Pygmies, whilst on the coast there are many with European blood in their veins. Generally speaking, mixed blood is everywhere. Sir Harry Johnston gives a good example of this. He found that on the Uganda–Congo border, Pygmy wives of 4 feet or so were much sought after by the 6-foot Sudanese soldiers. The division is founded on occupation and therefore on environment, and not on heredity.

The Tribes of the Congo Basin. Life in the forest is hard and

sombre. The forest lies, however, in the dried-out area of the old Congo lake and, everywhere, it is intersected by rivers and streams. It is upon their banks that most of the population lives, for it is upon the clearing along the banks that one may escape from the tsetse-fly, where fishing ekes out the livelihood, and where travel and trade are possible. It is probable that almost every tribe takes to the water if, and when, it can.

Within the forest, agriculture is a constant routine of clearing the site, burning the cut-down trees and undergrowth, hoeing, and planting on the ground enriched by the potash from the burning. The clearing and burning is the man's work, the hoeing, planting, and harvesting the woman's. Often the larger trees are left standing, for the small native axes and the little energy of these peoples are unsuited to heavy tasks. The village site must also be cleared so as to remove the shade essential to the tsetse-fly and to let in sun and air.

This is manioc country, for manioc is the most dependable crop and takes pride of place. Sweet potatoes, yams, and banana trees are also grown, whilst, near European influence, tomatoes and maize may be found. In this virgin soil the plot may serve for three or four years before it is exhausted. No manure is applied, for the use of animal manure is strange to the African, and in any case no cattle can be kept in a fly country. Presently dwindling crops make a move necessary, but there are preliminaries to observe. The chief must allot new areas, the administrative officer of the district must authorize, and the medicine man must bless, the enterprise. Expeditions are made, new clearings are begun, and a few men, with some women to cook and keep house, move off as an advance party. These folk are not nomadic: their object is to settle in again as soon as possible, and their dwellings are semi-permanent in type, differing widely from the moving tent of the nomad. There are, however, constant expeditions to make. The forest is rich in natural oils and in food of various kinds. Nevertheless collection is difficult and dangerous. One of the great evils consequent upon the enforced collection of rubber was the added infection of sleeping-sickness, and the same evil has always followed upon the constant excursions of the professional honey-seeker. Palm oil is the richest prize of all. To start with, it is used as an unguent for anointing the body, and, for this purpose, is mixed with powdered crimson camwood. This practice, especially noticeable along the rivers, keeps the skin in first-rate condition and keeps it free of those sores, pimples, and boils so often seen on the unhealthy. Palm oil is also used for cooking and lighting, and for preserving the canoes.

Another outing comes in the hunting season, which usually coincides with the floods. Game is then to be found on the higher ground and can be driven to the hunters. Ten or twenty men will set out, accompanied by two or three women to cook and to dry and smoke the meat. The first thing is to make temporary shelters, to dig pits, cover them with branches, and build stockades. Then lanes will be made to lead the game to the traps, and in the subsequent drive, spears and guns are the weapons employed. Such tribes as the Basanga of the south lead lives of the above sort.

Wherever possible tribes have their fishing and their trading expeditions. Some, such as the Bateke and Bayanzi on the Congo, the Bondjo and Azande of the upper Ubangi, and the Bayaka and Balunda of the Kasai basin, live mainly beside, upon, and from the rivers, and are the middlemen for their area. They will take smoked fish to the nearest centre, and return with salt, cloth, and enamel ware for their own use and to barter at local markets for cassava and forest products. Their clearings and long villages line the banks. (Plate 45).

Tribes of the Uplands. Round the fringes of the forest, in the Haut-Uele, upon the slopes of the mountains rising to the west of the Rift, and on the plains of Katanga, more open country offers a chance, here and there, of cattle farming. But these cattle areas are small and interspersed with bush which shelters the tsetse-fly. The local Bantu are, generally, taller and healthier than those of the forest. In Katanga agriculture begins to assume a new form in order to supply the mining population, and ceases to be purely for subsistence. In the mining area itself a new, mixed, population grows up in European rather than African fashion. Elsewhere differences from the forest Bantu are of degree rather than of kind.

In Ruanda-Urundi conditions are different. Here are real cattle areas, but the cattle owners are the Hamitic Watusi. The Bantu tribes, taller and lighter in colour than the forest tribes, are in the main agriculturalists, and, although they would own cattle if they could, their place in the Watusi scheme is to grow the food for their cattle-owning masters. The Wanyaruanda and Warundi, who are, properly speaking, the Wahutu, are the main original Bantu tribes, and, in spite of their vigorous character, are content to own the overlordship of the Watusi cheerfully.

Agriculture, in these parts, follows the same general lines as in the forest, but is devoted to grain rather than to cassava. There is vastly less clearing to be done, but the same routine of fallowing has to be pursued.

The Tribes of the Coast. If the Bantu of Katanga are learning new



47. *Typical Arabs of the region about Lake Tanganyika*



48. *Household fetish (Baluba)*



49. *Village fetish in shape of lions which have been made of clay. They guard the village and bring luck to hunters. They must receive oblations of blood from time to time*



50. *Azande Witchdoctor. Note the ritual whistles about his chest, also a small wallet, woven from grass, which may contain medicine*

ways in the mines, the tribes of the coast have been in touch with Europeans and with trade for centuries. They have acquired a taste for European goods, wear more clothing, and indulge in more ornament. Some trade as middlemen with inland tribes, whilst others work in factories and shops or, like the Krooboys, as deck-hands, and like them return to their own country to spend their earnings.

Hamites (Plate 46)

It seems to have been some 300 years ago that the Watusi reached, and settled in, Ruanda-Urundi. They are cattle folk, as are all their kin. They maintain racial purity by intermarriage, and form an aristocracy of birth and wealth.

The typical Eastern Hamite has thickish but not everted lips, though often the mouth shuts in a firm straight line. Colour is from red-brown to black. Hair is generally straight, although in some cases wavy. The nose is straight and the head-form narrowish (dolichocephalic). Men are very tall (almost always well over 6 feet) and the women shorter, and generally much fatter, than their long-limbed menfolk. Their attitude towards strangers (Europeans included) is that of well-bred indifference.

Men, women, and children are entirely occupied by their herds, the milk and butter they produce, and the duties of governing and directing dependent Bantu tribes who labour in the fields. Hamites regard their long-horned cattle almost as sacred beasts. Wealth is entirely a matter of cattle, and land is only necessary for their grazing and for the agriculture of the subservient peoples.

Their political structure is a kingdom served by nobles, and they have a rudimentary legal system. The overlordship of the Franks in a Gaul taken from the Romans, or of the Visigoths in Spain, may be thought of as parallel cases. Their rule and their organization have acted as a half-way house to European ways, just as have those of the Arabs and moslemized Berbers in the north of French equatorial, and west, Africa. Their ways of life differ so profoundly from those of the Congo Bantu that no mention of them is made in subsequent sections. Their Bantu servants differ from other Bantu tribes in that the men, forbidden either war or hunting, labour in the fields with the women.

Arabs (Plate 47)

The first Arabs who entered the country were merchants. It was later that they became slave traders. Some came from Nubia and

the Nile and installed themselves near the upper reaches of the Ubangi, in the country of the Azande and the Mangbetu. Others came from Zanzibar and settled about the Lualaba: in 1868 they founded a settlement at Nyangwe. They penetrated south into the plateau between the basins of the Congo and the Zambezi and occupied a part of Katanga. As they advanced they set up small sultanates. Their primary object was to purchase ivory. To convey this to the coast they required carriers and so they purchased slaves. Their expansion was checked, after fighting, by the Congo Free State, but they have introduced their religion and to a certain extent their dress and manners into the country.

The name 'Wangwana' is applied to any, swarthy brown or black, who wear the clothes and profess the tenets of Islam. Of pure-bred Arabs there are practically none. As one approaches Stanleyville from the west one meets tribes a little inland from the Congo who have adopted the religion, dress, and general civilization of the Arabs, and Arabized villages are to be met with on the eastern frontier. Arab architecture is displayed in the houses, with their verandas supported on pillars. The better houses have a platform in the central hall. Their villages are laid out with crossing streets, in Arab fashion, and surrounded by extensive plantations of rice, bananas, yams, tobacco, coffee, and millet. The inhabitants are hospitable and the chiefs intelligent. In the larger villages Moslem schools are established. In 1938 there were twenty-seven of these schools, recognized by Government, in Ruanda-Urundi. The men are dressed in the traditional Moslem robes. The women wear a simple robe of bright colours from the shoulders to the feet and are unveiled and unsecluded. Some men and women go on pilgrimage to Mecca and join up with the pilgrims from Zanzibar.

Their Minds

Character

The natives of Belgian Congo vary greatly in character and habits. There is a greater difference between Watusi and Pygmies than between Englishmen and Lapps. If there are some traits and customs which are common, or at least widespread, they are not many, and the remarks which follow apply mainly to the Bantu, who are in the immense majority.

The native is good-tempered and not fanatical. His outlook is practical. He is clannish and therefore capable of loyalty. His intrepidity in hunting and river navigation is a proof of his courage. In

his private habits he is decent. He is accused, not without justification, of a lack of responsibility and of laziness. Living as he does in an easy-going generous community, there is no great incentive to work. If his crops fail someone will come to the rescue. He is not solely responsible, in fact, and he seldom looks ahead. Moreover, work for wages under a master is, to him, a new thought. The background of his life has been the looking after his family. His wants are few, and his concerns at home. In the interests of that home he can work. He carries heavy loads to market and paddles long distances, but nature is bountiful, to-morrow comes, and his activity is spasmodic. Within his own community he is honest, and predial larceny is rare and considered detestable, but he thinks strangers fair game and his patriarchal upbringing induces him to consider his master's property as his own. Yet even here his larceny is within reason. He will appropriate an Aertex vest, or a pair of shorts; he will take a nip from the whisky-bottle, or a cigarette from the box, but he will, as a rule, be honest about money and will not do things which would seriously inconvenience 'the Boss'. The native is not particularly truthful, and when he is asked a leading question he usually gives the answer which he thinks is expected.

Misunderstandings are more likely to be on the European, than the native, side, for the African is very susceptible to atmosphere, understands more than one would think, and catches the drift of remarks even in languages with which he is little familiar.

Drunken bouts are common, and many villagers waken cross and with sore heads after a moonlight spree, but the native is not a toper. Those who have looked into an African cookhouse or slept in a native hut will not generally put cleanliness amongst the African virtues. Yet they are clean in person, and for ever washing themselves, their teeth, and their clothes. The lack of cleanliness in cookery and in their huts may be due to their habit of mind. Any illness is, to them, the result of the malignant action of some spirit and not a matter of infection.

It would be helpful to the European if he could see himself through native eyes. The African is a shrewd observer and often hits off the idiosyncrasies of a white man by a happy nickname. The explorer Stanley was known as Bula Matari (Breaker of Rocks) because of his road-making, and this has now become the native name for the Government. The native considers the European fussy and rigid. It is sometimes said that what the black man wants is justice without mercy, but this is misleading. The native point of view is rather that of the parable of the unmerciful servant (S. Matthew xviii. 23). He considers

that there is a place for entreaty and pacification and the European seems to him very unbending. Humour of course varies with latitude and longitude. The native has a great sense of humour and enjoys a Rabelaisian joke, but words like 'fool', said in fun, which to us seem harmless, may be taken as insulting. He resents injustice, favouritism, and sarcasm very keenly and can often find ways of geting his own back. In some spheres the European's failure to grasp the native point of view may cause a fiasco. This is especially true of witchcraft and 'medicine' (spells), which to us seem absurd and yet to the native are as real as they were to our ancestors. It need hardly be said that the native appreciates courtesy and resents brusqueness. Some of the chiefs have a great deal of dignity and self-control.

Religion (Plates and 48, 49, and 50)

A missionary who had spent twenty years in the Belgian Congo said that he would sacrifice a finger to live for a day inside the head of a negro —to understand what he was thinking of and how he thought about it. When we do get a glimpse of the black man's mind our own minds are coloured by nineteen centuries of Christendom. Every native language has a word for God, but the Bantu thinks of the Supreme Being as very remote from human affairs. It is natural objects and phenomena for which he has awe, for he does not draw a line between man and nature and say that the one has a soul and the other not. According to him there is a soul in everything, even in a tin trunk. To him thunder, lightning, trees, rivers, and rocks are all part of the same universal substance as himself—not malign in themselves but capable of being influenced or cajoled by certain persons into doing evil. They may also be induced to permeate objects such as wooden figures of men or animals which are then supposed to be spiritually dynamic and able to guard the possessor against the hostile forces of nature. The usual name for such figures is 'fetishes'.

The African believes in a spirit which can leave the body and does leave it during sleep. What are dreams if not memories of the times when the soul has crept moth-like from its case? Hence it is well to awaken an African cautiously, because he thinks that if he is awakened abruptly his spirit may not have time to return to his body. At death the spirit goes to dwell in a spirit world, but is believed to continue its interest in tribal life. This belief in survival exhibits itself in the cult of ancestors, which, however, is less practised in the Congo than farther east. On the grave are put plates, knives, calabashes, and other things for the use of the deceased. The plates are broken, the knives

bent, and the calabashes perforated, so as to 'kill' them and send them to the spirits.

The Bantu believes in white and in black magic. The practitioner of white magic is skilled in herbal remedies and salutary incantations. The witch or wizard has evil powers and uses them. He may be able to cause pain by making a figure of the victim and sticking spikes into it, or he may, by getting hold of something intimately associated with the victim, make 'bad medicine' (a spell) against him. Hence the care with which an African disposes of his nail parings or cut hair. The witch-doctor is skilled in discovering witches. When a native falls ill he believes that his illness is not natural. He knows that he was in good health before, and cannot understand why he should be ill now unless an enemy has put a spell upon him. He therefore consults the white magician or the witch-doctor for his own good and may employ the witch against his enemy.

Language

Belgian Congo, like Belgium, has two official languages—French and Flemish. All laws are published in both. It is estimated that 65–70 per cent. of the officials are bilingual and, as the courses at the Colonial University of Antwerp have been organized so that candidates for the Service should have a knowledge of both languages, the percentage is no doubt increasing.

A number of native clerks and black 'boys' speak French of a sort: a few speak the language really well. In Katanga 'boys' and other natives from south Africa speak pidgin English: those from Angola sometimes know a little Portuguese. European languages, even in the form of a pidgin dialect, have made practically no headway, except among the dependants of Europeans.

Most of the population speak Bantu dialects which, as already mentioned, seem to be derived from a common source. It is beyond the scope of this chapter to go into details, but a study of these dialects shows that the root words for various articles and animals common to the Bantu-speaking peoples point to the existence of an ancient mother-tongue from which they are derived, just as the Romance languages of Europe are derived from Latin.

Four of these Bantu dialects are outstanding in Belgian Congo. These are Lingala, Swahili, Kikongo, and Luba. Lingala was originally the speech of the Bangala but has become the commercial language spoken on the banks of the Congo as far up as Stanleyville. Swahili,

the lingua franca of East Africa, is Bantu in structure but rich in Arabic words. The Kingwana dialect of Swahili is spoken in the east of the colony, as well as south of Stanleyville and in Katanga. A traveller who knows both Lingala and Swahili can make his way anywhere in Belgian Congo. Luba is spoken in the basin of the Kasai and a part of Katanga. Kikongo is the speech of the lower Congo. A few officials and many missionaries can speak one or more native languages really well, and there are dictionaries and grammars of the chief dialects.

Next to the Bantu group comes the Sudanese group of languages. The dialects of the Azande belong to this group. What was the original language of the Pygmies is a debatable question. The best opinion seems to be that it was related to the speech of the Bushmen or Hottentots of south Africa. In modern times the scattered groups of Pygmies seem to have adopted the language of the neighbouring Bantu tribes. Although the Arabs have for long been settled in the country, their language in its pure form has not taken hold of the people, though it must be remembered that the Koran used in Moslem schools is in Arabic and written in Arabic character. The policy of the Colonial Government has been to make use of the chief native languages and especially Lingala. There are several good reasons for this.

The native learns Lingala or Swahili easily because its structure and roots are similar to those of his own language. African languages are a more suitable medium for the expression of native ideas than any European tongue can ever be. Unfortunately they possess no words suitable for the trade or industry of to-day. French is the European language most used in the Belgian Congo, and the Belgians do not relish the idea of spreading a creole French. They argue that the mass of the population will never learn to speak French; that Lingala and Swahili are spreading, and that it is much better to adopt them at once as media of communication with the natives. Belgian colonial statesmen have also noticed, from examples in and beyond their own colony, that the native who adopts French or any European language is apt to lose touch with his own people. The position, therefore, seems to be that the Government believes that a native language should be selected as the language of native administration. Lingala is already the language of the Army, and a knowledge of Lingala will serve one in any village where there is an old soldier. It is, therefore, the language most favoured for the role. In any case, Lingala plus Swahili would suffice. Each is already a lingua franca. At Stanleyville the Government publishes a small news-sheet in Swahili, and there are missionary publications in Lingala.

Their Manners

Family Life

In our European society the largest social groups are families consisting of parents and young children. As soon as the children become adults they start an independent existence and acquire property and rights and obligations of their own. Their debts and their property are not the debts or property of their brothers. In the Belgian Congo there are some households which are self-contained and do not share their private assets or liabilities with any larger group. These detached families are found in parts of the colony which, in the past, have been conquered by other tribes. There, marriages have occurred between members of different dispersed tribes, and so, in some of the villages, we find a dozen or more families between whom there are no ties of blood, because their members belong to various conquered tribes. In modern times natives of many tribes have collected in quarters on the outskirts of European towns and have intermarried. These families, who have no common blood ties, live side by side in a state of society which is more European than African. In a natural state of native society, however, every native belongs to a clan or group (descended in the male or the female line from a common ancestor) whose members cannot intermarry. A clan is distinguished by a totem, that is, some animal or bird which is considered to be of one blood with the members of the clan, and certain taboos are in force, prohibiting, for instance, the killing and eating of the totem animal. Each clan is subdivided into families, consisting of groups of near relatives and their dependants, living in communal fashion under the leadership of the head of the family. The family holds land in common and lives in a group of huts. Its distinguishing mark is its solidarity. All the members have common interests, and so, in Belgian Congo, there are no paupers.

Reference has been made to descent through females. Where this obtains the children belong to their mother's family. Their nearest male relative is their maternal uncle, who is the head of the family. When the sons reach majority they associate with their mother's family, and it is their mother's relatives who will assist in case of necessity.

It is common knowledge that by custom the natives of the Congo are polygamous. It is not so generally realized that in practice most of them have only one wife, because it is only the super-tax payer who can afford to pay several dowries. When a man has several wives he

has his own hut and each of his wives has a hut for herself and her children. There are of course natural jealousies and intrigues in a polygamous family, but as a rule the first wife welcomes a second as a means of escape from doing all the field and household work for the rest of her life. The gradual disappearance of polygamy, if it takes place, will be due to economic causes. The expense of multiple dowries has been alluded to. There is also the increase in the standard of living. The wife of a native clerk or artisan in good employment (especially if she has been to school) objects to remaining a drudge and expects servants, fine clothes and modern comforts. The husband finds that, with one wife, his expenses are sufficiently heavy to discourage further adventures.

Tribal Life (Plates 51 and 52)

Tribal life springs from clan life. A group of clans becomes a tribe. Some of these tribes are fairly numerous and, indeed, may reach the hundred thousands.

The chief is supposed to be the direct representative of the ancestors of the tribe. It is he who makes the sacrifices to the ancestral spirits, represents the community in its territorial rights, and with the assistance of his councillors settles disputes between the members of the tribe. He is also the rain-maker and provider of food. Grain is thrown at him as we throw rice at brides. The office of chief is hereditary, but may in certain cases descend to a nephew instead of to the eldest son. As insignia chiefs often wear leopard-skins. Their subjects pay tribute of game or fish, skins, ivory, and produce.

In all tribes there is a constant struggle between the elders and the young men, and when the chief and his elders are stupid and ignorant and the young men have received some education, the latter are apt to despise authority. In general, native society knows no castes. There are, however, parts of the country, invaded in the past, in which the population consists of a superior and an inferior class. This is especially the case in the north-east. The Mangbetu have imposed their authority upon a group of Bantu and negro tribes. The mass of the Azande people are the offspring of prisoners of war who have been welded into one people. The Bakuba peasantry are the descendants of tribesmen conquered by invaders from the north. In Katanga a military aristocracy imposed its yoke on numerous tribes in the region of the Lomami and founded the sultanate of the Baluba-ba-Kongolo. The chiefs of other Baluba—the Baluba-bena-Sangala—



51. *Bateke Chief (region of Stanley Pool)*



52. *Chieftainess Mahanga, wife of Chief Msidi* (*p.* 197). *She is thought to be over 85 years of age*



53. *Market scene, Stanleyville*



54. *Village in Ituri Forest*

exercised supremacy over nearly a million subjects, consisting partly of conquered tribes. These chiefdoms lie in an area tapped by the old slave road to Benguela, and probably owe their existence to that fact. Other chiefdoms are to be found in the region of Kivu, but none of the Congo chiefdoms can compare for a moment with the sultanates of Ruandi-Urundi, which have a feudal character, nobles, and a royal family. In these sultanates and great chiefdoms the position of the chief is different from that of the patriarch of a tribe. The chiefs of the Azande and Mangbetu and the rulers of Ruanda and Urundi are the masters, not the fathers, of their peoples. They act in their own interests, except in so far as policy may prompt them to consider their people. In the great chiefdoms the land belongs nominally to the chief and he appoints and dismisses his officers. In short, the patriarchal societies are democratic while the great chiefdoms are aristocratic.

The Belgians have abandoned their original policy which, like that of the French, was to europeanize native institutions. Their present aim is to preserve and utilize them as far as possible. In Katanga, however, where the country is largely industrialized and where the workers are collected from many tribes, it has been necessary for the Government to appoint suitable persons to be chiefs.

It is common knowledge that west Africa abounds in secret societies, and the Congo is no exception. These societies are nearly always directed towards the advantage or prestige of some group inside a given community and not to military or revolutionary activity outside it. Some of the societies represent the vestiges of aristocratic or privileged classes. Others are criminal or immoral.

It is a general custom to mark the transition from youth to manhood or womanhood by certain initiation ceremonies which involve a period of seclusion and have the object of preparing the neophytes for adult life, and of teaching them endurance, self-control, and a sense of responsibility. Initiation is sometimes accompanied by circumcision in the males or excision in the females, but neither practice is universal.

Until European rule repressed it, cannibalism was prevalent amongst the Bantu and the mixed peoples of the north, such as the Mangbetu and Azande, but not among the Pygmies. Among the Bayanzi it was not considered in good taste to eat one's own relations or those who had died a natural death, but some other tribes were not so squeamish. In many cases, though not in all, human flesh was eaten in order to acquire the powers of the victim or to rule over

his spirit. Nowadays, although not extinct, it has become a hole-and-corner business.

Food and Markets (Plate 53)

The Pygmies live on game, insects and reptiles, wild honey, fish, fungi, bananas, seeds, and roots. The staple food of the river tribes consists of fish, plantains, ground-nuts, cassava, pawpaws, and sweet potatoes. Dried plantains are converted into flour by the tribes near Stanleyville. Rice is cultivated by the Bakuba and is grown extensively by the tribes of the Manyema (or Maniema) district and of the Lualaba.

Some sugar-cane is cultivated inside the Congo basin. Maize is grown widely. The main diet of the forest tribes is manioc (cassava), and of the eastern cattle-owning tribes millet. The bitter variety of manioc must be well washed, for the tubers are semi-poisonous until they have been soaked. It is then ground into flour and made into balls or cakes called (in Lingala) *kwanga*. Millet is also used to brew beer, but the forest Bantu brew their beer from bananas, and all the tribes who live in the country of the oil palm drink palm wine, which when fermented and kept for some time is very intoxicating. The Pygmies, with rare exceptions, make and take no fermented liquor.

The Pygmies keep no domestic animals, except small dogs, but the Bantu keep goats, sheep, and fowls, and, in many places, pigs. Cattle are only found in the north-eastern borders, Ruanda-Urundi, and the Balunda and Baluba country, and any idea of milking cattle or goats is foreign to the Bantu.

Markets are held at regular intervals, sometimes every fourth day. Natives come to the market from near and far, often travelling through the night. They bring goats, pigs, fowls, eggs, vegetables, pumpkins, sweet potatoes, fruit, cassava, and so forth. The market lasts a day, and only the refuse is left to mark the scene.

There are some outstanding differences between the economics of a European country and those of a community in the Congo. With us the individual produces one form of wealth in order to exchange it for another form of wealth, and it is only farmers and crofters, to a limited extent, who produce for the immediate needs of their families. In the Congo, on the other hand, the individual produces first and foremost for the needs of his family and only as a side-line with an eye to barter.

In the Africa of yesterday there was no room for a distinction

between capital and labour. Indeed the capital was the sum total of the land, the stock and the labour of the community, to which it all belonged. In the kingdoms of the Azande, and in the sultanates of Ruanda and Urundi, the land in theory belongs to the rulers, and the descendants of the conquered tribes have only the usufruct, but in practice the usufruct is tantamount to ownership.

In the Congo, as throughout Africa, there are middlemen who make a living out of intertribal trade, but they find little place in the trade that goes on within the boundaries of a tribe. There, as a general rule, the small native producer of pottery, salt, foodstuffs, and the like, sells his own goods at the nearest market, for the best price that he can obtain.



FIG. 29. *Lokele Warrior*

Hunting and Fishing (Fig. 29)

Game supplies much of the diet. The Pygmies live by it and the forest Bantu depend upon it. The northern tribes kill elephants with poisoned arrows or in pits or by traps which drop a weighted spear. Many tribes use hunting-nets and have well-trained dogs to flush and drive the game. Pitfalls and snares are in general use amongst both Bantu and Pygmies. The Pygmies' favourite weapon is the bow and poisoned arrow which can kill big game in an hour and a man or small animal in less than that. No doubt the threat of their poisoned arrows has saved the Pygmies from extermination. There are few Bantu who use bows and arrows. Their predilection is for spears and lances and open fighting. The spear is the chief weapon throughout the Congo, although the blades are not so long as in east Africa. The tribes in the region of the northern Congo use throwing-knives. All these weapons, however, are fast giving place to the gun, which has been so long in use among the Balunda that it has almost exterminated big game in their area.

Naturally the native, killing for food rather than for sport, prefers his victim 'sitting'.

All the waterside tribes are keen fishers and many tribes make fishing expeditions. An exception must be made in the case of the Pygmies, who are not fishermen. Many methods are practised. The inhabitants of the tidal creeks are experts with the cast-net. The natives of the lower Congo set baskets and traps along the edge of



FIG. 30. *Wangilima Hut*

the torrent to catch fish swept down the rapids. On the middle Congo the local tribes use many kinds of nets, from large seines to small hoop-nets and cast-nets, as well as fish traps. The shallows of Lake Leopold II are full of fishing-stakes. Fish are also caught by setting traps below weirs, by poison, and by spearing. Fish are netted in the great lakes or caught with rod and line, but most of the natives of the Belgian Congo prefer more wholesale methods than angling. A method of night fishing practised on Lake Tanganyika is to fix a lighted brazier at the end of a sort of bowsprit. The fish—small fry like whitebait, known as 'dagaa'—are attracted by the light and are scooped up with a landing-net.

Houses (Figs. 30–33. Plates 54 and 55)

Huts are of two principal types. In the west and centre they are rectangular. This area coincides roughly with the Great Forest. In the north, east, and south, that is, on the plateau, they are round. In the north-east, however, the conical hut encroaches on the rectangular form—in the country of the Azande and Mangbetu who have negro blood. In the south-west the Bayaka are a mixture of forest tribes and plainsmen and have adopted the rectangular forest type of hut. The round hut originated in east Africa and the rectangular hut on the west coast. The conical hut is a development of the round type and is most common in central Africa.

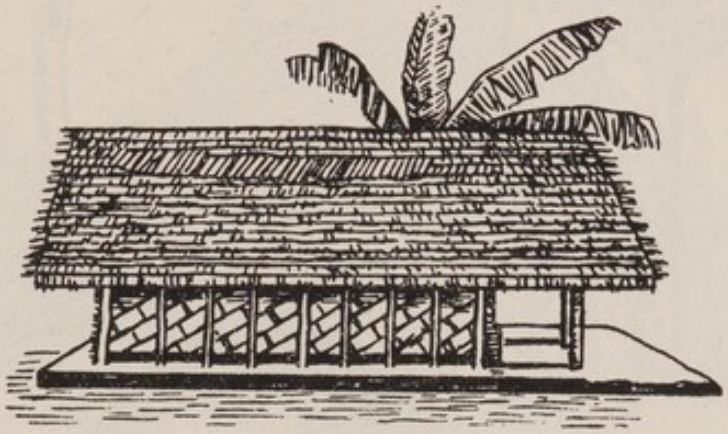


FIG. 31. *Hut in Cataract Region*

The most primitive and perhaps the original type of round hut is that of the Pygmy, which is simply a bent-over-bough shelter covered all over with leaves. This type is further developed in the domed huts of the Basongo-Meno which are all roof, and the conical or pyramidical huts of the Aruwimi region. Mud is used to plaster the walls.

On the lower Congo the huts of the Bakongo are usually detached and are rectangular in form, built of sticks, with thatched, ridged roofs and thatched walls, and sometimes have a veranda. Owing to the hedges, the paths to the villages are difficult to follow without a guide, and in times of insecurity the inhabitants used to have a nasty habit of strewing them with poisoned splinters.

The huts of the Bateke are built in groups or in rows with their backs to the river, and in shape resemble neat Nissen huts. The Bayaka villages are scattered. Their huts are built of reeds and divided into two rooms. The Bambala chiefs have rectangular huts which are sometimes 30–45 feet long and often include a loft. The Baluba huts are also rectangular, but have as a rule rounded roofs and are usually divided into two rooms.

The huts of the Bakuba are of two different types. In the west they are rectangular and made of planks roofed with palm fronds. In the east they are domed structures, about 15 feet high, 9 feet wide, and 12 feet long, thatched with grass. Provisions are stored in a rack

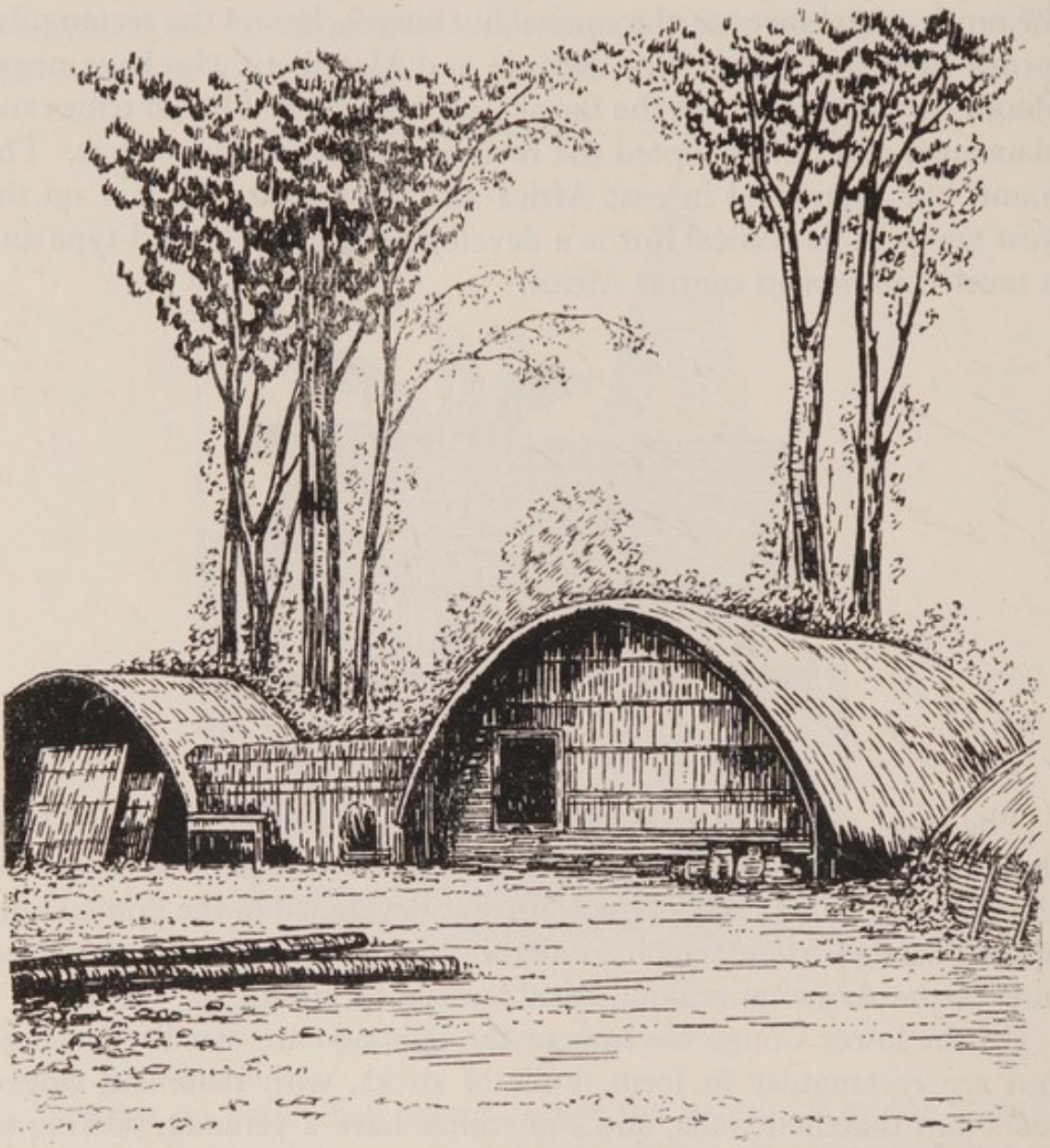


FIG. 32. *Bateke Huts*

and preserved by the smoke of the fire which, in all Congo huts, is kept constantly burning.

The Basonge or Zappo-Zaps build rectangular huts with rounded roofs and thatch them with grass. The hut is usually divided into two apartments by a mat partition.

Throughout the forest, from Stanley Falls to Lake Albert and as far east as Ruwenzori, the Bantu tribes construct conical huts with porches. The Arabs build square mud houses, and under their in-

fluence the Manyema tribes erect their huts on a clay platform and plaster the walls.

In the south-east of the Belgian Congo the huts are made of sticks and grass with mud floors. In the central part of the Congo basin we find examples of 'ribbon development'. The Bayanzi houses, which vary very much in length, are built on each side of a street, and stretch for several miles. The Balolo huts are also built continuously, but are arranged in squares or crescents. The Bangala huts are rectangular and about 24 feet long, $7\frac{1}{2}$ feet wide, and 5 ft. 10 in. high under the



FIG. 33. *Banana-leaf Hut*

roof-ridge. They are easily taken to pieces and removed to another site. Bangala villages consist of either one straight street or a square.

Some of the Ababua tribes build round huts of beehive shape or with conical roofs and bark walls. The northern Ababua, however, build rectangular huts in a long street. The Azande build huts in groups and have no real villages. Their huts are round, with mud walls and peaked roofs. The prevailing type of Mangbetu hut is round and elegantly built, with grass walls and conical roof.

Dress and Ornament (Fig. 34. Plates 56 and 57)

Speaking generally, the style of dress varies with the regions into which the population has been divided at the beginning of this chapter. The Pygmy, leading a life hardly superior to that of an ape, wears a bark loin-cloth. The coast native dresses in cotton print and store clothes. In the eastern part of the Congo basin Moslem robes have been introduced by the Arabs. On the northern frontier Sudanese influence is displayed in the baggy breeches of the men and

the draperies of the women. In the centre, the people are nearly naked and decorate their skins by designs in relief or in colour. Most river tribes plaster their bodies with powdered crimson camwood which looks most effective in the sunshine. The men of the Gombe tribe sometimes decorate themselves with elaborate scrolls in four colours carefully applied with a feather.

The Mangbetu paint their bodies in black stripes, like a zebra, or in spots, while the Balunda, in the south of the Congo basin, pipeclay their bodies. This custom of body-painting extends as far north as the Ababua, who decorate their bodies black and white and crimson with charcoal, white clay, and camwood. The habit is, however, dying out.

It is a custom among the forest Bantu to cover their faces and bodies with a raised pattern of scars or weals made by cutting the skin, and this is known as cicatrization and must be distinguished from tattooing, which consists in pricking the skin and rubbing in colouring matter. On ascending the Congo the first tribe to be met, with scar-marks on the face, are the Bateke, who have five or six parallel slits down their cheeks. Cicatrization is far more common than tattooing, and is done on many parts of the body (Plate 56).

Many of the central and north-eastern tribes file all the front teeth to points. To a certain extent, but not invariably, this custom is associated with cannibalism.

In the regions of the Ubangi, Uele, and Lomami the custom of inserting wooden disks, 2 or 3 inches in diameter, in the lobes of the ears is common, and the Bakwese carry their snuff-boxes in the ear.

The women of the forest Bantu tribes, from the basin of the upper Aruwimi to the Lualaba, perforate their lips in the centre and gradually introduce larger and larger wooden or ivory discs until the lips resemble a duck's bill.

All the Congo tribes, except the Pygmies and some of the forest Bantu, pluck out or shave off the body hair, and the Bateke and other tribes pluck out the eyebrows and eyelashes, while the men pluck out the moustache and beard also. The Bayaka, Bambala, and other tribes shave the head partly, but no Congo tribe shaves the head completely, except as a sign of mourning.

Some of the coiffures are striking, particularly among the women. The Mangbetu train their hair into a cylinder, and, to accentuate the effect, compress the heads of their children between flat pieces of bark which are tied tightly on either side of the skull. The Azande, Ababua,



55. *Village in region of Lake Kivu*



56. *Bapoto Chief. Note the cicatrization which is common to his tribe*



57. *Mohunda. Ceremonial head-dress*



58. *Head of guitar (Baluba workmanship)*

and other tribes weave thread into their hair. The Nsakara and Bakango dress their hair in plaits covered with cowries or beads. The men of the forest tribes frequently wear their hair dressed in a cone or mitre. The Baluba and Bakuba do their hair in cockscombs. There is, in short, no end to the variety of style.



FIG. 34. *Mangbetu Woman*

Necklaces, rings, bracelets, and anklets are also worn. The Bangala women wear brass collars of 20–25 lb. weight. When the collar is made an opening is left. The woman slips on the collar and the smith closes the opening on his anvil. To have it removed the wearer lies down, and by twisting creepers which are tied to either side of the collar, and fastened to stakes 10 yards apart, the ring is opened. Heavy brass anklets are found among the people who live near the

river Congo, and leg ornaments of coiled iron wire are worn by the Ababua women and by other tribes. These heavy ornaments are the local equivalent of diamonds, jewellery, or a bank balance. Each is worth so many brass rods, which were the local currency and possibly still circulate.

The simplest clothing is found among some of the north-eastern tribes, whose women wear a bunch of leaves. The men wear a breech-clout or pair of small drawers. The Bayanzi and other tribes wear loin-cloths formerly made of raffia cloth or bark cloth, but now of calico. Native looms were introduced by the Bantu, and the spinning and weaving of cotton, to a small extent, by the Arabs. Before the import of European cotton goods the tribes south-west of the Congo used raffia cloth and the tribes to the north used bark cloth.

The Balunda chiefs wear long kilts or skirts. Head-dresses are commoner in the east than in the west, and are worn mainly for ornament. Sandals are almost unknown, but European boots are bought.

Art (Fig. 35; Plates 58, 59, and 60)

Of all the tribes, the Bakuba and Baluba are the most artistic. They weave remarkably fine cloths and mats in geometrical patterns and soft colours. Their sculpture especially is full of character and seems to be the outcome of generations of good craftsmanship. The figures are copied from nature with certain conventional modifications. Vases, stools, sticks, and drums are decorated with figures, and the designs are often of rare quality. Pottery, wooden cups, and caskets are decorated with chevrons, triangles, and key patterns which have their special names, such as 'the Finger', 'the Chameleon's claw', and so forth. The patterns are attractive, and a touch of irregularity gives character to the work.

According to native tradition, some of the Basongo-Meno were created of iron and are excellent smiths, others were moulded of clay and are famous potters, the Bushongo were carved of wood and are sculptors, while the Bapende were made of raffia and are skilful weavers. The townspeople, adds the legend, were created out of the refuse.

Notable among works of art are the masks and statuettes, which are usually carved out of wood. What distinguishes these masks is neither tragedy nor comedy, but, with all their grotesqueness, a certain

severity. The statuettes are remarkable for the disproportion of the head, which is exaggerated.

The native of the Congo is naturally musical and has a series of instruments, as well as songs and chants for every occasion. Dancing to music plays a great part in native life and reaches its highest development in Ruanda-Urundi, where the court dancers are highly

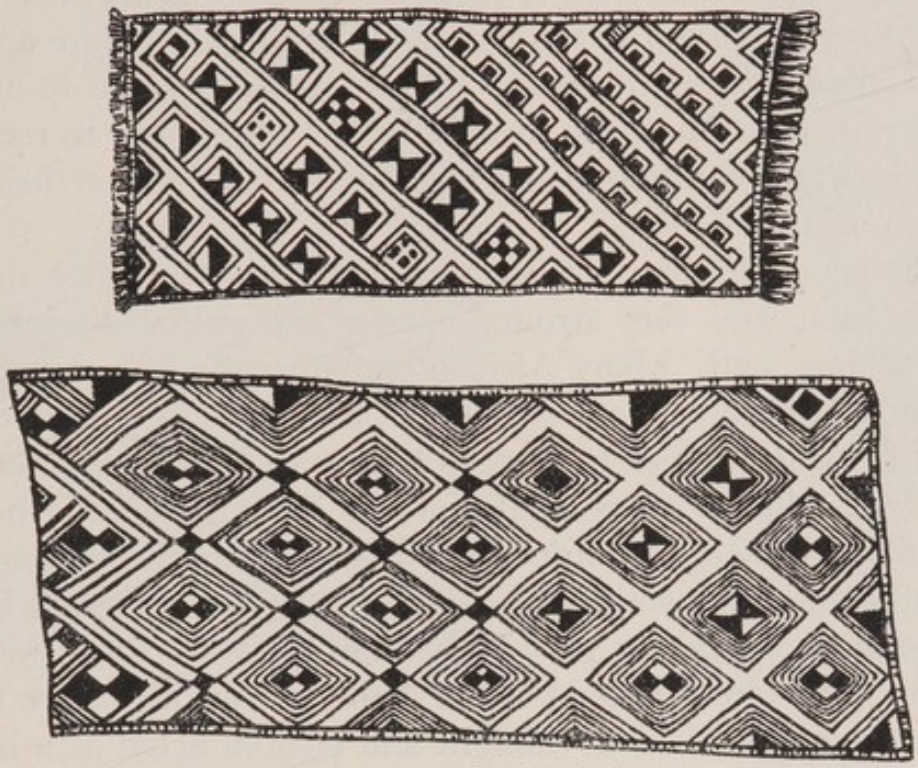


FIG. 35. *Bakuba cloths*

trained and the formal movements of the chiefs as they brandish their spears in unison present a striking spectacle.

A NEW GENERATION

(Plate 61)

In the preceding sections an attempt has been made to describe native minds and manners as they existed before European intervention and as, in fact, they still remain throughout the mass of the Bantu population.

Nowadays, from Kimberley to Duala, from Mombasa to Dakar, indeed in all centres of African development under the stimulus of European individualism, the native can be seen in a stage of transition. In no African dependency is this process developing faster than in the Belgian Congo. At first development was forced, and that often brutally. Now it is very carefully considered, and tempered with kindly, even paternal, thought. In the larger industrial or mining

centres there are special native reservations where the African lives in European style, has water and electricity laid on, and works, European fashion, for a comfortable wage. In these centres there are no hereditary chiefs, no native standards of morals or hygiene, no tribal public opinion. Indeed the labourers so gathered together must represent dozens of different tribes. The men are fed and doctored free, but pay a proportion of the cost of their houses by instalments. Rations and blankets are issued to wives and children. Chiefs are appointed and councils largely nominated. The workman bicycles to his work; the wife puts on a European overall for her washing or to receive the day's rations; the children, books and inkpots balanced on their woolly heads, go off to school.

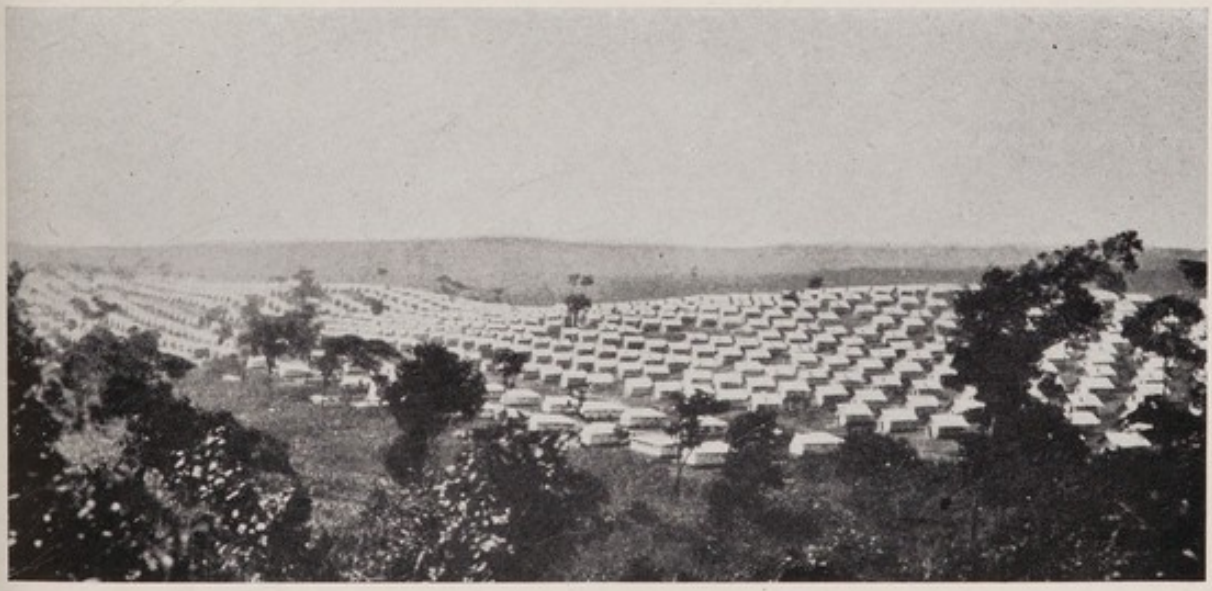
Is this spoon-feeding likely to supplant and improve upon the generally sane, and very strong, standards of tribal discipline? At present it goes well. Many African craftsmen have found responsibility and pleasure in work well done, but there are grave dangers. The shirker is not driven to work as he was in his village community. The wife, no longer responsible for the feeding and the health of her family, excused all outdoor work, not given the 'power of the purse' and the responsibility of eking out the weekly wage, has perhaps the more dangerous part. The Bantu, always quick to imitate and copy, may often be tempted into the vulgarities native to town life. In the north Moslem thought and custom acted as a half-way house. Its easy voluminous clothing, its tolerant morality, were not so difficult to adopt. In the Congo generally European ways of life have burst upon the Bantu with no intermediary. He is asked to go direct from bottom to top gear. The old standards are not changing, they are gone. The new are a-making, and the results remain to be proved.



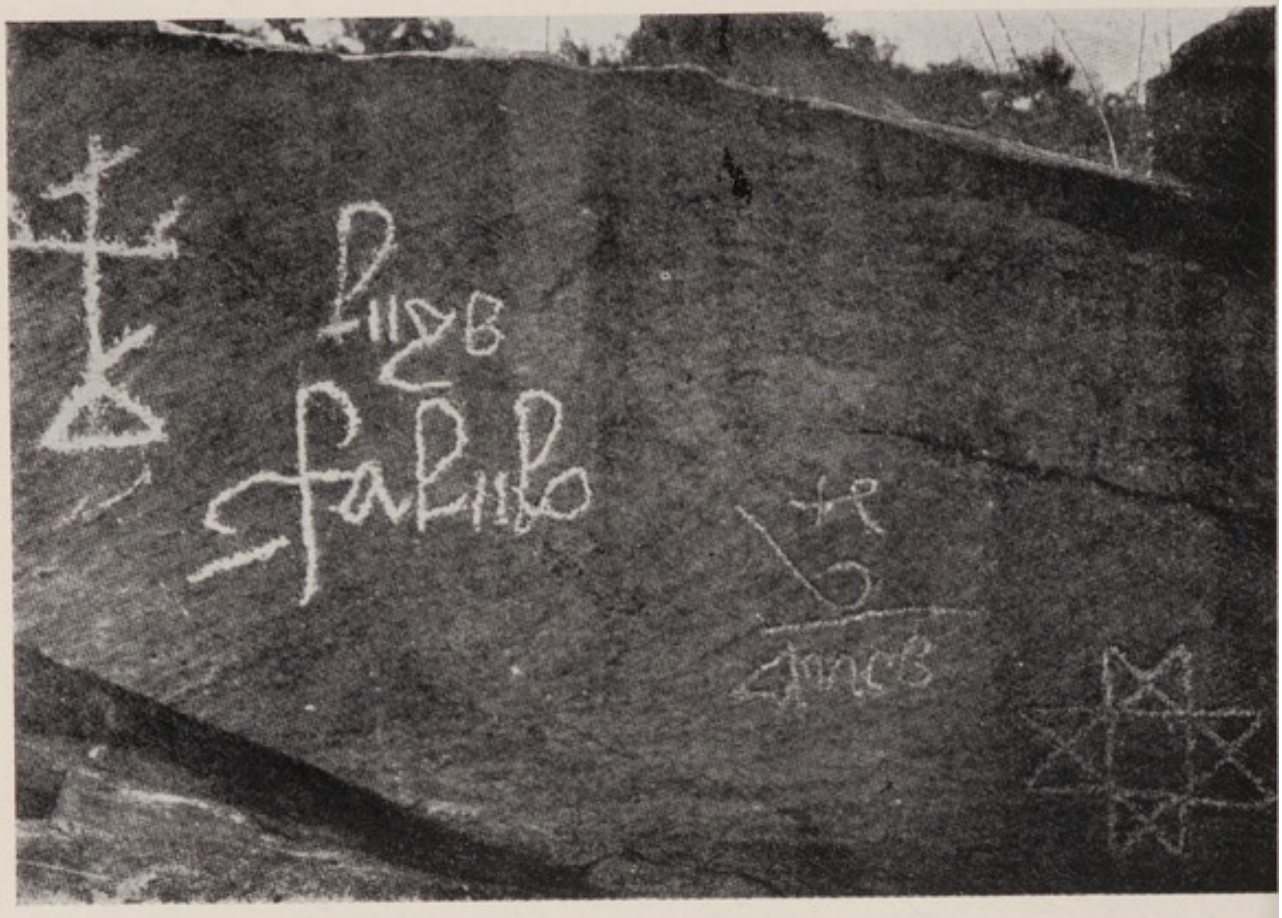
59. *Stool (Baluba)*



60. *Mask (Baluba)*



61. *Quarters built for natives by Union Minière at Panda (Katanga). Compare with Plates* 54 *and* 55



62. *Part of an inscription on rocks near Mposo river (above Matadi) cut by members of Diego Cam's Second Expedition in* 1485



63. *Sefu, the son of Tippu-Tib and his representative, at Stanley Falls. The Belgian officers were killed in the Arab rising not long after this photograph was taken*

CHAPTER VIII

HISTORY

Introduction

Very little is known of the interior of the Belgian Congo before the nineteenth century, since the earlier history of its peoples has still to be pieced together. Such history as exists is that of comparatively modern exploration, but there are, nevertheless, transient gleams of light on the not very remote past. As early as the end of the sixteenth century tales had reached the Atlantic coast concerning a great bantu kingdom of Luanda in the region of the headwaters of the river Kasai. Later there were rumours of native empires farther to the west; but an empire in this part of Africa was more often than not ephemeral and did not outlast two or three generations. Doubtless empires have arisen in the Congo only to disappear, and to leave confused legends in their wake. There is, however, in the fifteenth century, authentic information concerning the portion of the Congo which lies near the Atlantic coast.

Exploration

(Plate 62)

The Portuguese Discovery of the Congo

The capture by the Portuguese in 1415 of Ceuta, opposite to Gibraltar, may well have been the first step in the modern exploration of Africa. It was there that a grandson of Edward III of England, Prince Henry the Navigator, won something more than his spurs. From the captive Moors of Ceuta he learned of Timbuktu as well as of the gold and ivory of more remote and legendary parts. He was fired with ambition to know the truth concerning these things. From the school of navigation, which he established at Sagres near Cape St. Vincent, he sent ship after ship on voyages of discovery. His work was not accomplished when he died in 1460, but fortunately the kings of Portugal were prepared to continue it. In 1482 John II of Portugal dispatched to the west coast of Africa an expedition which was the first to sail as far south as the mouth of the Congo river. It was commanded by Diego Cam, whose name was still remembered in 1900 by natives in the Congo region as Ndo Diege Cam. He christened his new-found river the Zaire, probably confusing the native word for a river (*nzadi* which is sometimes pronounced much like 'nzari') with

its own proper name, and returned to Portugal after a short stay, but not without taking four natives with him as hostages. Three years later he returned to the Congo. As a sign of Portugal's interests, and rights by discovery, in these regions he brought with him a stone column or *padrão* which he set up on the south side of the river's mouth (at *Ponta Padrão* or Cape Padron). Continuing his exploration, he took some of his flotilla up the river until he encountered the broken water at the foot of the first cataract, which is above the present port of Matadi. He recorded this exploit by cutting an inscription on a rock, which can still be seen and wondered at. But Diego Cam's work was not entirely exploratory. Through the agency of the four native hostages, whom he had brought back to Africa with him, he opened negotiations with the 'king' of Kongo, a powerful native chief, who at that time seems to have been paramount over the territory between Stanley Pool and the coast both on the north and south side of the Congo. In due course he visited the king's chief town at Ekongo, some 50 miles or so south of the river, where he made a great impression at 'court'. When he returned to Portugal he took back with him presents from the king of Kongo for his own king—ivory, native mats, and palm-fibre cloth for the most part. A number of young Congolese were also sent with him so that they might be instructed in the Christian faith and in turn instruct their own people. Later, Portugal exercised suzerainty over the kingdom of Kongo, and set up a capital at Ekongo, which was renamed San Salvador. The country was not freed from all dangers by that fact, for it was ravaged by the Bayaka (or Jagga), a fierce native tribe which descended on it from the region about the Kwangu, and it was deemed necessary to protect San Salvador from further raids by building a stone wall about the place. A cathedral and a convent were also built within the city, and by 1543 it contained the palace of a bishop. The subsequent history of the kingdom of Kongo in general, and of San Salvador in particular, is a part of that of Angola, but it must be recorded that from the days of Diego Cam to the present day, and in spite of many vicissitudes, Portugal has maintained an interest in the old kingdom of Kongo. This point will be referred to later on.

The American Slave Trade and the Congo of the Eighteenth Century

By the end of the seventeenth century the growing demands for labour in the new American plantations and in the West Indies exercised a profound influence on the development of western Africa. It was found that African natives could be transported across the

Atlantic at highly profitable rates, once they had been enslaved, and that there were those on the coast, both white and black, who were willing and anxious to do all that was necessary in the way of enslavement. Gradually the hinterland of west Africa came to be looked upon as an inexhaustible reservoir from which black labour could be drawn at will. Otherwise the country was of little interest to anyone, so little indeed that a map of 1710 indicates the interior of the Congo regions as 'wholly unknown to Europeans'. In spite of this ignorance of geography tens of thousands of men and women from the inland forests were enslaved by their own or neighbouring tribes, sold to the slave traders and transported through Angola to the Americas. Incidentally the slaves took with them the folk-tales of their own lands. The 'Uncle Remus' tales of our days were told round the fires of the Congolese long before they reached the plantations of the southern states of America.

The climax of the slave trade was reached in the eighteenth century. The Dutch supplanted the Portuguese as the great slave traders, and Great Britain supplanted the Dutch. It is estimated that, between 1680 and 1786, the British alone carried over two million negroes from the west coast across the Atlantic. But in 1792 Denmark forbade its nationals to indulge in the slave trade, and in 1807 Great Britain followed suit. By 1815 only Spain and Portugal carried on the trade. In 1817 it was made piracy, and our cruisers watched the coast, but still cargoes of slaves slipped through. Finally in 1833 slavery was abolished throughout the British Empire. With this change of heart came a new spirit of investigation into African affairs.

Captain Tuckey's Expedition, 1816

In 1816 Captain Tuckey was dispatched by the Admiralty to explore the Zaire, or Congo, river, for, 'independently of any relation which the Congo might be supposed to have to the Niger, the river itself, from its first discovery by Diego Cam down to the present time, was of sufficient magnitude to entitle it to be better known'—so runs the Introduction to Tuckey's *Narrative*. With difficulty Tuckey got some of his boats as far as Diego Cam's inscribed rock and penetrated about 180 miles from the coast into the interior. The expedition could get no farther, for it was defeated by lack of knowledge of the elements of tropical hygiene. Tuckey perished in his attempt to fathom the secrets of the Congo river, and was buried on Princes island near Boma. In 1822 H.M.S. *Barracouta* sailed a short way up the river, and from time to time other British ships followed, usually with a

view to the suppression of slave trading. But the mystery of the Congo river was not to be solved in this manner nor from this direction. The course of the Congo was discovered by expeditions from the east and not from the west coast of Africa.

Exploration, 1850–1877 (Fig. 36)

Exploration of the northern and western regions of Africa had been undertaken in the early years of the nineteenth century, but about the middle of the same century public interest shifted from the north and west of the continent to the south and east. The traffic in slaves from the west coast had practically ceased owing to the vigilance of British cruisers, but not entirely, for there are records of slaves being smuggled out of the Congo as late as 1871. It was, however, common knowledge that markets in east Africa were still being supplied with slaves from the interior. At the same time, in the 1850's, a new spirit of exploration arose which was animated by a healthy humanitarianism. Explorers set out not only to reveal the secrets of the source of the Nile, or the mysteries of the centre of Africa, but to discover an antidote to the evils of the eastern slave trade. Free trade, it was hoped and believed, would cure the slave trade by making it unnecessary, and the quest of the explorer was more often than not for practicable routes into the interior over which trade might flow. David Livingstone was one of the new school and the greatest of many great explorers of his age. In 1854, whilst in the service of the London Missionary Society, he crossed the continent of Africa from east to west, from Quilimane to Loanda, and discovered the existence of the Kasai and some of its tributaries. In 1856 two Indian Army officers, Burton and Speke, after a journey of great hardship, discovered Lake Tanganyika. Speke also brought back information of a great lake to the north-east of Tanganyika which he afterwards proved to be no other than Lake Victoria. Livingstone, who had resigned from formal missionary work and had become British Consul for Central Africa in order to devote himself to the new exploration, discovered lakes Mweru and Bangweulu on his third and last great journey (1866–1873). He also followed the Lualaba river as far north as 4 degrees south of the equator, thinking that he had probably discovered the headwaters of the Nile. From Nyangwe on the Lualaba, sick and almost destitute, he crossed over to Ujiji on the east coast of Lake Tanganyika, where he was found by H. M. Stanley in November 1871, and greeted in that memorable sentence, 'Dr. Livingstone, I presume.'

Stanley at this date was more of a newspaper correspondent than an explorer. His expedition had been financed by the proprietor of the *New York Herald*, Mr. Bennett, who was in search of the sensational. Still intent on the true course of the Lualaba, or the Nile, whichever it should prove to be, Livingstone, after parting from Stanley near Tabora (in Tanganyika Territory), returned to Bangweulu, near which lake he died on 30 April 1873.

Before it was known in Europe that Stanley had found Livingstone other expeditions had been organized for his relief. One of these, under Lieutenant Grandy, R.N., made an attempt to reach him from the west coast. Grandy landed at Ambriz in Angola and set out for San Salvador. With difficulty he managed to penetrate some 60 miles to the north-east of that place (actually as far as Tungwa, in what is now the Bas-Congo district of the Belgian Congo). Hearing of Livingstone's death he did not adventure farther but dismissed the expedition.

A second expedition achieved notable success. This also was commanded by a naval officer, Lieutenant Lovett Cameron. He left Bagamoyo, on the mainland opposite Zanzibar, in March 1873 and proceeded to Tabora. During October, while resting near this place, he had a letter from Jacob Wainright, one of Livingstone's servants, telling him of his master's death. A few days later the roughly embalmed body was carried through Cameron's camp on its way to England. Nothing daunted, Cameron continued his journey, believing that he was instructed to explore as well as relieve. He went forward to Lake Tanganyika, which he circumnavigated almost completely, discovering, *en route*, the only outlet to the lake, which is the Lukuga river. He continued westward to the Lualaba, which he pronounced to be none other than the Congo and not the Nile. Foiled in an attempt to descend the Lualaba he turned westward and made his way across the continent to the Atlantic, which he reached at Benguela during November 1875. He did much more. In the course of a journey which took him along the watershed of the Congo and Zambezi, he made treaties with African chiefs and hoisted the British flag, actions which placed definitely before the British Government the option of assuming a protectorate over the inner basin of the Congo. But the British Government of the day, through Lord Carnarvon, would have none of it, owing, it has been said, to the opposition of Liverpool and Manchester.

If there were any doubts as to the course of the Lualaba they were finally to be set at rest by Stanley while the results of Cameron's

journeys were still being debated. He had now entered the fiel definitely as an explorer, and his second and greatest African ex pedition was made during the years 1874–1877. This time two news papers, the *New York Herald* and the *Daily Telegraph*, financed th expedition which, under its indomitable leader, first circumnavigate Lake Victoria, then journeyed south and west to Lake Tanganyika and from there west to Nyangwe. From Nyangwe Stanley, brush ing aside all difficulties and opposition, followed the Lualaba down stream to the Congo, and the Congo to the ocean. He left Nyangw on 5 November 1876 and arrived on the Atlantic coast on 12 Augus 1877. It was on the Lualaba that Stanley first met the Arab Sheikh Hamid bin Hamid, or Tippu Tib as the natives called him, and thi acquaintance was to bear fruit in the future. Meanwhile, a Germa botanist, Schweinfurth, had discovered the Uele river betwee 1868 and 1871. He did not suspect that it flowed into the Congo about which he then knew nothing, but took it to be a tributary of th Niger. Other explorers, scientists, missionaries, and adventurers German, Belgian, and French, all added to the fast accumulatin knowledge, and by 1875, or 1880, sufficient was known of the salien facts of the geography of central Africa to turn men's thoughts t questions of administration. It was abundantly clear to all who cared to see that the native chiefs, the 'emperors' and 'kings' of legend, could or would do little or nothing for the protection of their people and land. Explorer after explorer revealed how tribe ravaged tribe, man ate man, the slave trader prospered, and how the fertile country side of to-day was the desolation of to-morrow. There was no peace or security for man or beast. Livingstone did not exaggerate when he wrote of the 'open sore of Africa'. Besides all this the scramble for Africa by European Powers was beginning.

International Associations

African International Association

King Leopold II of the Belgians had followed the initial stages in the opening up of Africa with the keenest attention. Entirely on his own responsibility he invited representative explorers, geographers, and philanthropists of the civilized nations to a conference at Brussels on 12 September 1876. For three days the future of central Africa was discussed with more optimism and good intention than knowledge. The discussions ended in the formation of an 'African International Association' which had, as its avowed aim, the civilization of central

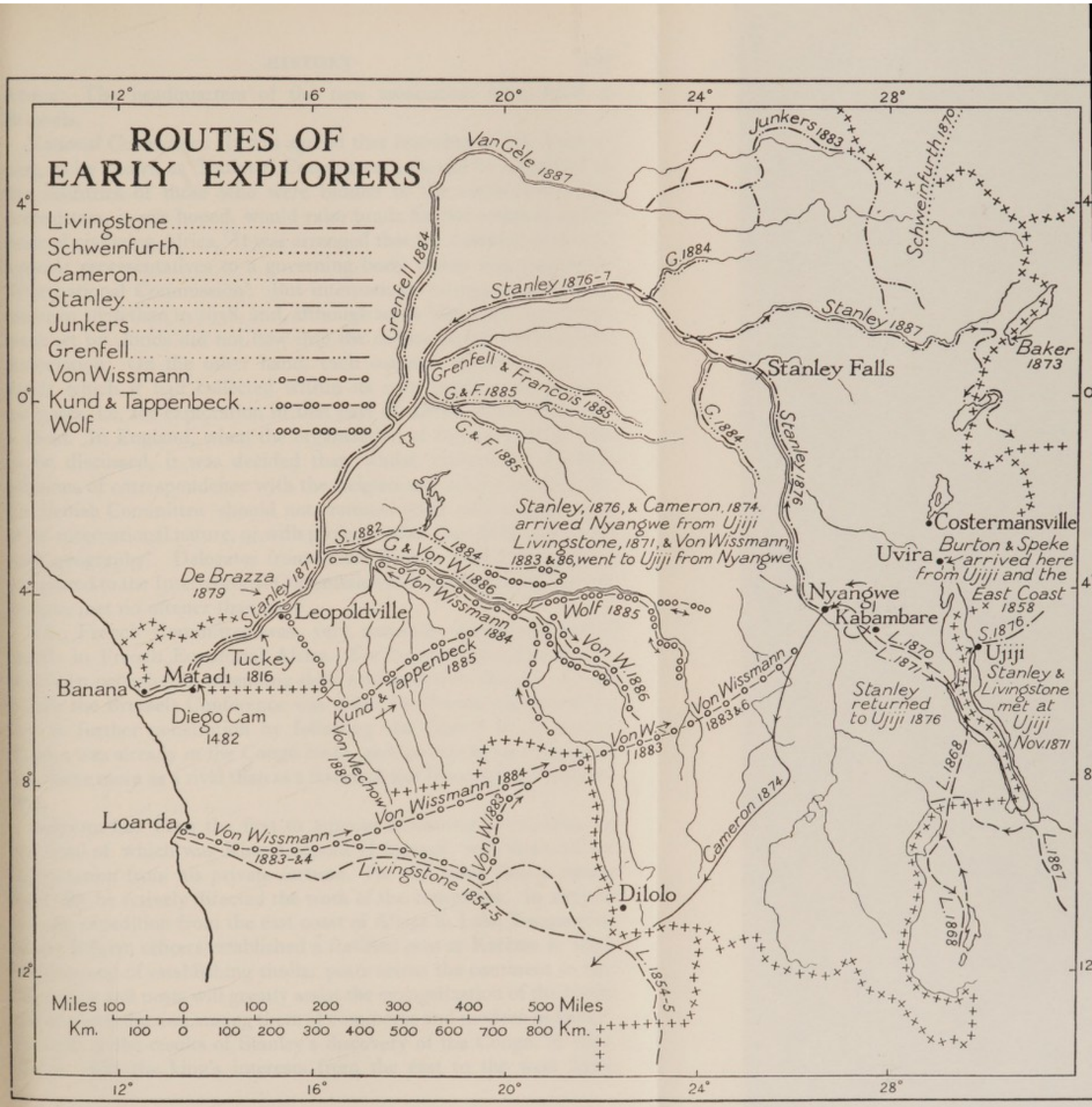
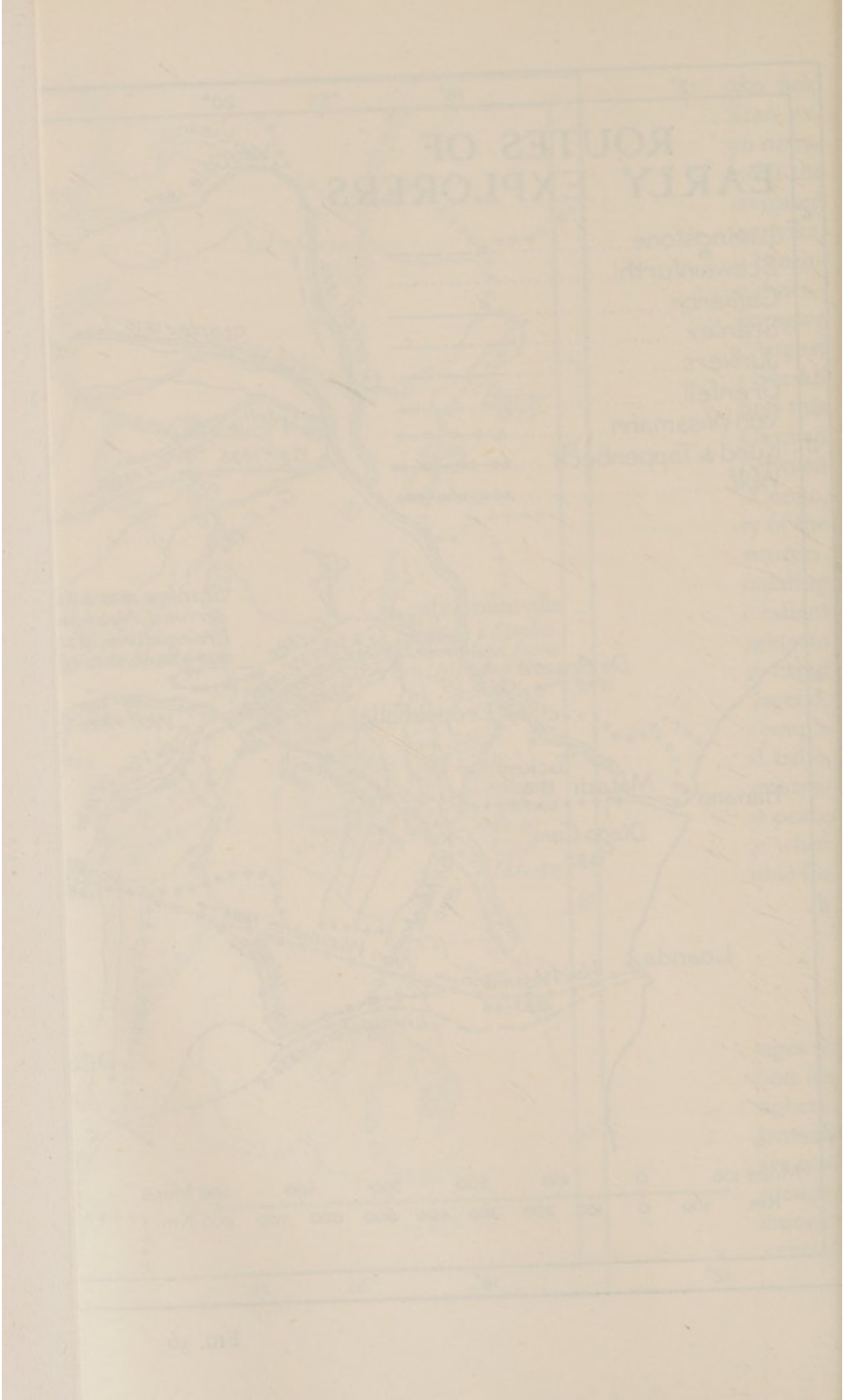

ROUTES OF EARLY EXPLORERS
Livingstone
Schweinfurth
Cameron
Stanley
Junkers
Grenfell
Von Wissmann
Kund & Tappenbeck
Wolf
12°
16°
20°
24°
28°
4°
0°
4°
8°
12°
Van Cèle 1887
Junkers 1883
Schweinfurth 1870
Grenfell 1884
G. 1884
Stanley 1876-7
Stanley 1887
Baker 1873
Stanley Falls
Grenfell & Francois 1885
G. & F. 1885
G. 1884
Stanley 1876
Costermansville
Stanley, 1876, & Cameron, 1874. arrived Nyangwe from Ujiji
Livingstone, 1871, & Von Wissmann, 1883 & 86, went to Ujiji from Nyangwe
Uvira
Burton & Speke arrived here from Ujiji and the East Coast 1858
S. 1882
G. & Von W. 1884
Von Wissmann 1886
De Brazza 1879
Stanley 1877
Leopoldville
Wolf 1885
Nyangwe
Kabambare
S. 1876
L. 1870
L. 1871
Ujiji
Stanley & Livingstone met at Ujiji Nov. 1871
Tuckey 1816
Matadi
Banana
Diego Cam 1482
Kund & Tappenbeck 1885
Von Wissmann 1884
Von W. 1886
Von Wissmann 1883 & 6
Stanley returned to Ujiji 1876
Von Mechow 1880
Von W. 1883
Cameron 1874
L. 1868
Loanda
Von Wissmann 1883-4
Von Wissmann 1884
Von W. 1883
Livingstone 1854-5
Dilolo
L. 1867
L. 1868
L. 1854-5
Miles 100 0 100 200 300 400 500 Miles
Km. 100 0 100 200 300 400 500 600 700 800 Km.

FIG. 36



Africa. The headquarters of the new association were fixed at Brussels.

National Committees. It was agreed that branches of the Association, to be known as 'National Committees', should be organized in the countries of those who were bidden to the conference. The committees, it was hoped, would raise funds for the common enterprise of civilizing Africa. It was arranged that the committees should appoint representatives to a governing body which was named the 'International Commission'. But international co-operation was no easier in 1876 than in 1938, and, although some National Committees were set up, funds did not flow into the coffers of the International Association. On the other hand, each country wished to use the funds which it had collected within its own borders for its own purposes, i.e. for exploration in that part of Africa which interested it most. In England, when the organization of the committee came to be discussed, it was decided that, whilst 'maintaining friendly relations of correspondence with the Belgian and other Committees', the British Committee 'should not trammel itself with engagements of an international nature, or with projects other than those connected with geography'. Delegates from Great Britain were not therefore appointed to the International Commission at Brussels, which appears to have met no oftener than once.

The French Committee was, very naturally, preoccupied with events in French Equatorial Africa. For twenty years Frenchmen had been occupied in extending their settlements in Gabon. A year before the Brussels Conference was called De Brazza had found the key to further penetration by following the Ogowe to its source. France was already in the Congo basin, and, as events were to prove, was there more as a rival than as a friend of the International Association.

Belgium had been the first to appoint a National Committee, at the head of which was King Leopold II himself, who financed the organization from his private fortune. He was more than a figurehead, for he actively directed the work of the committee. In 1877 he sent an expedition from the east coast of Africa to Lake Tanganyika, where Belgian officers established a fortified post at Karema in 1879. He dreamed of establishing similar posts across the continent so that 'our roads and posts will greatly assist the evangelization of the blacks and the introduction among them of commerce and modern industry'. But one of the results of Stanley's discovery of the Congo, in 1877, was to shift the king's interests from the east to the west coast.

Heretofore the gateway to the interior of Africa had been Zanzibar; now it was to be the river Congo.

International Association of the Congo

In November 1878, therefore, another committee was formed at Brussels. It was given the title of 'Le Comité d'Études du Haut-Congo', and Stanley, who had returned from Africa the previous January, was present at its first meeting. The Comité d'Études du Haut-Congo later became known as the 'International Association of the Congo'. Stanley, again anxious for activity, took service for King Leopold under the new association.

Stanley's Third Voyage

Stanley returned to the Congo, and on 14 August 1879 arrived at Banana at the river's mouth. For the next three years he was busy establishing stations on the upper river for the International Association, and negotiating with native chiefs. In October 1882 he returned to Europe and reported in person to the Association at Brussels. He declared that the Congo basin was not worth a 'two shilling piece' without a railway between the lower and upper Congo, and in order to render the country 'even prospectively valuable' a charter must be obtained from the European Powers to build the railway and to govern the land through which it would pass. By 1884 the International Association of the Congo considered itself worthy to receive such a charter. It claimed to have made 'treaties' with 450 independent African chiefs, who had transferred their rights of sovereignty to the Association for substantial considerations. It was stated, in further support, that a number of chiefs had been induced to connect their several chiefdoms into a concrete whole, and that the Association claimed recognition of its right to govern that whole in the name of an independent state. No other Power disputed these claims and, on 22 April 1884, the United States recognized the Association as a governing Power on the Congo river. A few months later, on 8 November, Germany also recognized the Association.

The Berlin Conference

The Background

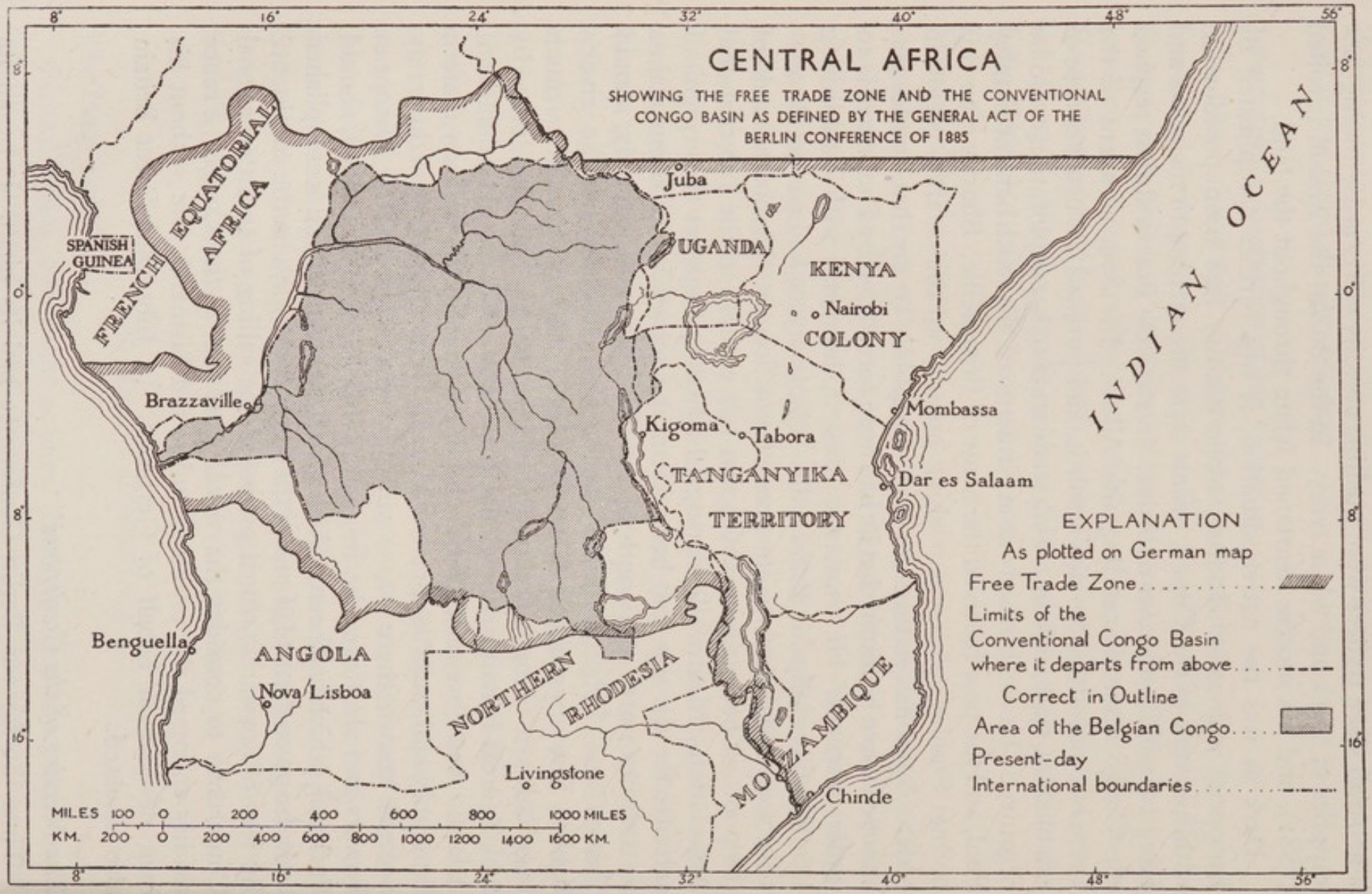
Central Africa, now in the political limelight, had never been in so troubled a state. To its usual routine of war and pestilence had been added the evil of a growing traffic in slaves to the eastern ports.

The Arab slave traders were pushing steadily westwards, finding new supplies of black and white ivory. In the Sudan the Mahdi revolted (1881), and his success heartened Islam throughout the land.

Dark as was the native situation, it was further complicated by European jealousies. Indeed, while Stanley had been pushing on with his work in the Congo, events were threatening to make his and King Leopold's schemes abortive. In 1877 De Brazza almost reached the Congo after descending the Alima. In 1879, as agent of the French Committee, he did reach it, and pursued his usual course of establishing stations from which trade and further exploration could be organized. He established one at Kintamo on the south bank of Stanley Pool, and the post received the name of Brazzaville. Shortly after this he met Stanley, who was pushing his way up the cataract region in order to establish stations for King Leopold. To say that Stanley was annoyed when he found that he had been forestalled by De Brazza is an understatement. He contented himself, however, with establishing Leopoldville alongside Brazzaville. Before a year had passed Brazzaville was transferred to its present position on the north bank of the pool. The southern shore was left entirely to the International Association. Meanwhile Portugal had taken fright at these signs of activity, for she saw that her ancient and somewhat nebulous claims to territory north and south of the Congo were in jeopardy, should France and Belgium finally establish themselves on the river's banks. She approached Great Britain on the matter. After much negotiation a Congo Treaty was signed on 26 February 1884, by which Great Britain acknowledged the claim of Portugal to the line of Atlantic coast between 5° 12′ and 8° south latitude, with an eastern limit at Noqui, near the present Matadi. When the terms of the treaty became known there was a storm of protest from the European Powers and also from the English press. Why, it was asked, should Portugal, which had been in Africa for four centuries and accomplished little, be given control of one of the finest waterways on the continent? By way of answer Portugal proposed the calling of an International Conference to consider the whole question of the Congo. France readily endorsed the proposal and so did Bismarck, not without his own designs on behalf of Germany. In July 1884 Great Britain also assented.

The Meeting of the Conference

Thus the famous Berlin Conference had its birth. It began its meetings in Berlin on 15 November 1884, and concluded them on


CENTRAL AFRICA
SHOWING THE FREE TRADE ZONE AND THE CONVENTIONAL CONGO BASIN AS DEFINED BY THE GENERAL ACT OF THE BERLIN CONFERENCE OF 1885
INDIAN OCEAN
SPANISH GUINEA
FRENCH EQUATORIAL AFRICA
Juba
UGANDA
KENYA
Nairobi
COLONY
Brazzaville
Kigoma
Tabora
Mombassa
TANGANYIKA
TERRITORY
Dar es Salaam
Benguella
ANGOLA
Nova Lisboa
NORTHERN RHODESIA
Livingstone
MOZAMBIQUE
Chinde
EXPLANATION
As plotted on German map
Free Trade Zone
Limits of the Conventional Congo Basin where it departs from above
Correct in Outline
Area of the Belgian Congo
Present-day International boundaries
MILES 100 0 200 400 600 800 1000 MILES
KM. 200 0 200 400 600 800 1000 1200 1400 1600 KM.

26 February 1885. Every state of Europe, except Switzerland, sent one or more representatives, as did the United States of America. Great Britain, France, and Germany had already agreed in principle to the creation of a Free State within the basin of the Congo, and the great purpose of the conference was not so much to discuss the boundaries of this state as to come to an understanding with reference to the Congo basin as a whole. Stanley attended the conference as a geographical expert and held a watching brief on behalf of King Leopold.

The General Act (Fig. 37)

'The General Act of the Conference of Berlin' gave freedom of trade to all nations within the region watered by the Congo and its affluents and indeed in a broad strip of equatorial Africa reaching from the west to the east coast. Only such dues were to be levied as would reimburse sums spent in the interests of trade; no differential dues were permitted and all rivers were to be free to the flags of all nations. After a lapse of twenty years the subject of import duties could be reconsidered. The Powers were to combine to suppress the slave trade and slavery. These were the principal conditions with regard to the Congo, although many other matters of interest to colonizing Powers were discussed.

It was not until after many conferences, negotiations, and compromises that the boundaries of the Free State were decided upon. Finally Portugal abandoned her claims to territory immediately about the mouth of the Congo and contented herself with Cabinda north of the river and Angola to the south.

The Congo Free State

Establishment

At the Berlin Conference the title 'International Association of the Congo' was changed to the 'Congo Free State' (État Indépendant du Congo), and, eventually, with the permission of the Belgian Parliament, King Leopold was named the 'Sovereign' of the new state. His dual functions as King of the Belgians and Sovereign of the Congo Free State were absolutely distinct and should not be confused. In Belgium he was a constitutional monarch, in the Congo he was absolute.

Already Stanley had adopted a flag for the International Association, a golden star on a blue ground (which was the flag of his old American

state of Texas), and the golden star became the recognized standard of the new state. Stanley was the actual state builder, and his own native name *Bula Matari* (Matari is the same word as Matadi, the port, and means the same thing) was to the natives synonymous with the term for government. They looked upon all of the new state's agents as Stanley's own men (i.e. Bula Matari's men). Stanley's account of how he received the name is as follows: 'The Vivi chiefs', he writes, 'wonderingly looked on while I taught my men how to wield a sledge hammer (to break stones) effectively and bestowed on me the title Bula Matari—Breaker of Rocks—with which, from the sea to Stanley Falls, all natives of Congo are now familiar. . . .' There was also a certain native chief by name of Francisco Bula-Matadi who was buried in the Cathedral of San Salvador centuries ago.

With the passing of the old title the international character of the government also showed signs of change. Heretofore some British administrators had been appointed. The first High Commissioner was Sir Frederic Goldsmid. Sir Francis de Winton was Administrator General from 1884 to 1885. The king had already engaged General Gordon as Agent General when he was diverted to Khartoum by the British Government. Now Belgians were appointed to the higher posts and the field for international enterprise was narrowed.

Social Problems

When viewed as a whole the task which the new-born state had undertaken seemed colossal. A vast country had to be explored in detail, communications had to be opened up, posts established, law and order enforced, and all had to be accomplished with a comparatively small staff of inexperienced men. There was no cohesion between the tribes, so that each tribe had to be dealt with separately (perhaps this was fortunate for the new rulers of the land or there might have been much more opposition to their new order), there were many different dialects to master, a thousand customs to be learned and some to be suppressed. But the new officers went to their work with all the optimism of the partly informed, and it must be recorded that they accomplished a great deal in a comparatively short time. It was not thorough. For example, as late as 1916, and perhaps later, isolated acts of cannibalism were still reported. In the 1880's and 1890's it was a common practice in some but not all parts of the Congo.

Cannibalism. The natives of the Bas-Congo were not cannibals,

neither were some of the other peoples, but it has been said with more force than accuracy that, when the foundations of the Free State were being laid, man, as an article of food, was the dominating idea of the negro populations east of Stanley Pool and west of Tanganyika. The regions about the Ubangi river seemed to harbour the worst offenders. A missionary reported of this area: 'There was a much greater demand for human flesh than the local markets could supply. The people did not, as a rule, eat their own townsfolk and relations; but kept and fattened slaves for the butcher, just as we keep cattle and poultry. . . . Sometimes a section of the town would club together to buy a large piece of the body wholesale, to be retailed out again. . . .' There is no need to go into still more lurid details. Gradually the new Government managed to stamp it out. Though there have been recurrences of cannibalism, the perpetrators are now as ashamed of their indulgence as they were unashamed a few years ago.

Slave trading. It was beginning to be clear to Arab slave traders and to Belgians that the two degrees of civilization which they represented could not live in harmony in the same land unless one or the other was prepared to surrender its cherished ideals. The Arabs were not prepared to do so and the Belgians could not. The Arabs' sole idea seems to have been to trade in ivory and in slaves; of pity or love for the country in which they lived they had none. In Coupland's *Exploitation of East Africa* occurs the following description of the Arabs' methods of collecting slaves:

'A village having been carried by assault, all the inhabitants who had not escaped or been killed in the fighting were rounded up—except those too old or decrepit to be saleable—and the huts were set on fire. Three villages were once seen burning within two hours. Cattle would be driven off. Standing crops might be cut down, or left to rot. There was no one left to cultivate them, unless a handful of fugitives crept back to their homes. . . . This destruction was often widespread. The explorers speak of "miles of ruined villages". Nor were the actual slave-raids the only injury done to the countryside. If they occurred in the sowing season, the strife and anarchy provoked meant insufficient crops and famine . . . a starving tribe would sell its own folk for food. . . . The slaves' worst sufferings were those they endured between their capture and their ultimate consignment to their masters. The march to the coast, to begin with, was a terrible experience. . . .'

Of course Europeans had to interfere, provided that they had sufficient force at their command to make interference effective, and

of course the Arabs resented interference as an infringement of their hitherto unquestioned right. Captain Storms, a Belgian officer, did actively defend the natives on Lake Tanganyika from Arab slave raiders. Besides this the Free State was becoming every day a more formidable competitor in the ivory trade.

The Arabs, therefore, thought that they had just cause to put the matter to a test. In August 1886 they attacked the Free State post at Stanleyville and killed the two Belgian officers in charge. The incidents which culminated in the attack on Stanleyville constituted the first Arab revolt, which soon died down. The acknowledged head of the Arabs was the Tippu Tib, mentioned above, who had established himself near Stanleyville in 1885, but he took no part in the revolt, for he was in or approaching Zanzibar at the time. His nephew Rachid was the leader of the Arabs on that occasion.

Political Problems (Fig. 38)

The Nile. The revolt of the Mahdi and the death of General Gordon in Khartoum had immediate consequences for the new state.

From the very beginning King Leopold was far from satisfied with territory confined to the Congo basin. He intended to enlarge it. He was, later, to annex Katanga; he had made some tentative moves towards the Zambezi, and had taken over the upper reaches of the Kasai from Portugal. Above all he wanted a more convenient approach to the oceans than he possessed, and much to his disappointment he had been foiled by Germany in an attempt to find a direct route to the Indian Ocean. Naturally his thoughts turned to the Nile, the study of which had fascinated him from early manhood. The revolt of the Mahdi seemed to have placed it within his grasp. In 1883 he had suggested to Gordon that the southern province of the Sudan should be severed from Egypt and tacked on to the sphere of influence of the then International Association. When Khartoum fell in 1885 the Egyptian Government had to abandon the provinces of Kordofan, Darfur and the Bahr el Ghazal to the dervishes, but the international position of the abandoned provinces was by no means clear.

Since the fall of Khartoum the Governor and officials of the Equatorial Province of the Sudan had been isolated from Egypt and the rest of the world. The Governor was a German, Eduard Schnitzer, who was better known to the world as Emin Pasha. The Egyptian Government, assisted financially by a group of British philanthropists, organized a relief expedition under Stanley's leadership. Stanley was,

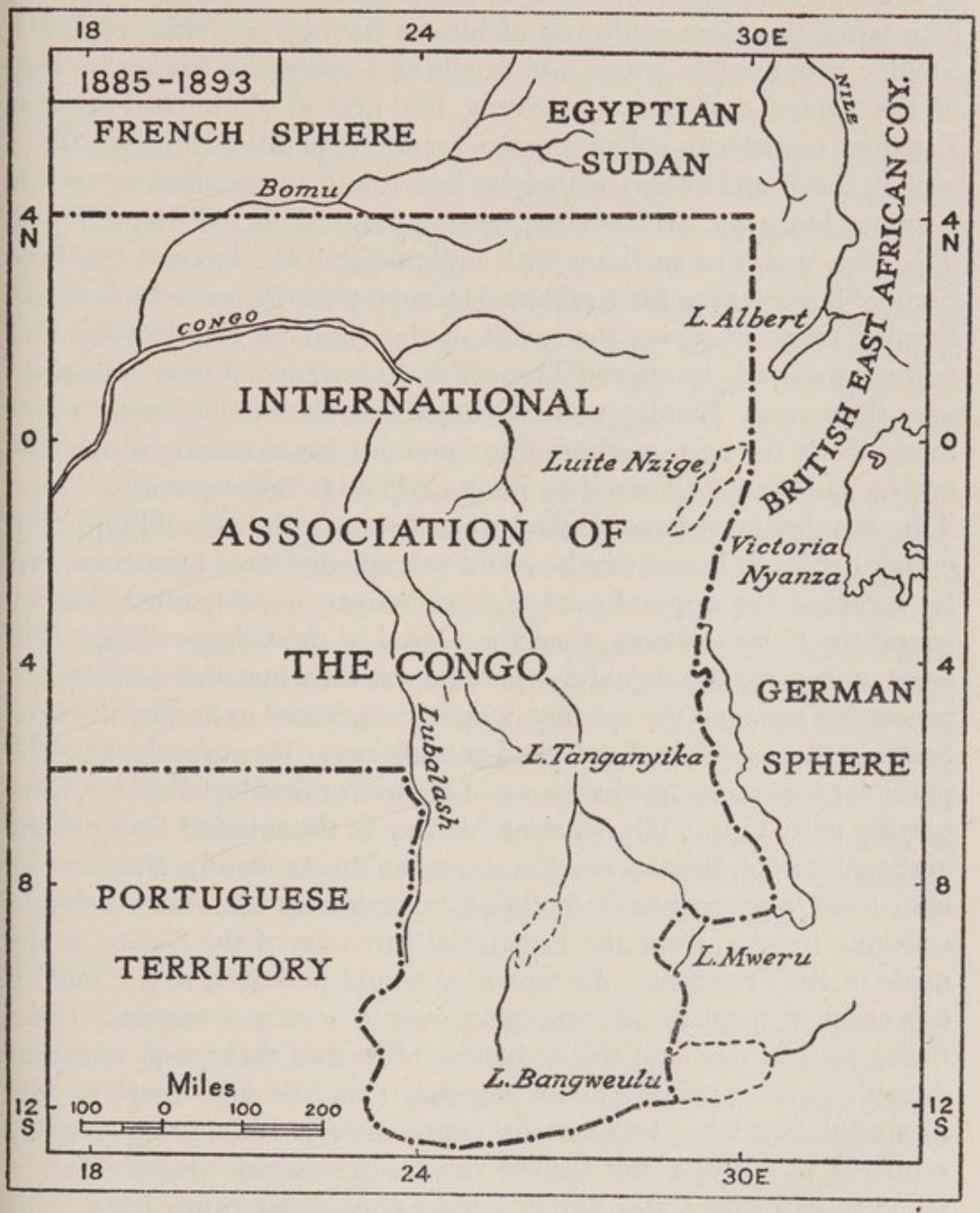


FIG. 38. *Showing the boundaries of the International Association of the Congo as they were conceived in 1885 and shown on contemporary maps.*

At this date it was assumed that the Lubilash and Bomu rivers fell directly into the Congo. Lake Edward was known as the Luite Nzige and was believed to cover a much larger area than it does. The extent of Lake Bangweulu was also much exaggerated. The British East Africa Company began work in 1888. The Egyptian Sudan was overrun during the same year.

of course, a natural link between the Egyptian authorities and Leopold. The latter therefore made use of him as the bearer of his proposals. Stanley proposed to enter, and finally did enter, the Sudan by way of the Congo and Aruwimi rivers, but first of all he had to visit Zanzibar in order to collect porters for the expedition through those agents, Arab and other, whom he had found so satisfactory on his previous journeys. At Zanzibar he encountered his old friend Tippu Tib, who was now seething with indignation. He accused the Free State of bombarding his Arabs with Krupp guns for no reason at all. Stanley knew all about the revolt of the Arabs at Stanleyville, and without more ado he offered Tippu Tib the governorship or 'vali-ship' over these men. Stanley was convinced that this was the most expedient, if not the best, method of maintaining peace among the Arabs, and he had been authorized by King Leopold to negotiate with Tippu Tib. Stanley must have blinked when he made the offer; Tippu Tib certainly did. It is said that he could not reply for some moments. But he accepted the appointment and, moreover, accompanied Stanley round the Cape to Boma, then the capital of the Congo. Tippu Tib went up river to Stanleyville, where he was duly installed as Vali, and proceeded to spend the subsidy, which was granted to him by the Free State, in the purchase of arms and ammunition. However, he kept the peace for some time, probably out of regard for Stanley. Stanley, after parting with Tippu Tib, went on his way to the relief of Emin Pasha via Stanley Pool, Basoko, and Yambuya (on the Aruwimi). Stanley was instructed to propose to Emin Pasha, when he met him, that he should continue to administer the Equatorial Province of the Sudan in the name of the Free State. In return he would be raised to the rank of Governor at a salary of something over £1,000 per annum. Emin Pasha politely declined this seductive offer, and thereupon was conducted, most unwillingly, to Bagamoyo on the east coast by the masterful Stanley. Incidentally, immediately afterwards, Stanley returned to Europe and visited central Africa no more. Having failed to win over Emin Pasha, King Leopold determined to try his fortune by other means. In 1890 he sent a military expedition under a Belgian officer, Van Kerckhoven, towards Emin Pasha's abandoned province. The advance guard under Lieutenant Ponthier left Stanleyville in December, and reached the Nile some months later. This dangerous move was soon to involve the Free State in serious fighting. While these events were in train, the British Government, with an eye to recover its position on the upper Nile, had in 1890 secured an admission from Germany that the British sphere of influence in

East Africa was bounded on the west by the Congo Free State and by the western watershed of the basin of the upper Nile; but this claim was not recognized either by France or by the Congo Free State.

Katanga. In the south the political situation was also somewhat obscure. Katanga was ruled by a native chief, one Msiri or Msidi. He had been visited by British explorers, and in 1890 he was also visited by Mr. (later Sir Alfred) Sharpe, who, as Vice-Consul in British Central Africa, invited him to place himself in the British sphere of influence which, at that time, was extending about Nyasa and in Rhodesia. Msiri declined the offer and he also refused to have anything to do with the Free State, when Stairs, one of Stanley's old officers, wished to negotiate with him.

Msiri was exceedingly unpopular with the tribe over which he ruled (he himself was of another tribe) and was faced with rebellion, and his country was threatened with famine. He thought that Stairs might be prevailed upon to assist him against his people, and on being disabused of this idea he plotted against the life of his visitors. At an interview which had been arranged to discuss the situation Msiri's followers attacked a Belgian officer, Captain Bodson, who drew his revolver and shot the chief, only to be killed himself. The ruler of Katanga having been thus removed, the Free State flag was hoisted and the country was effectively occupied against all comers. Whatever the result of this affair might have been, Katanga undoubtedly lay within the geographical limits of the Free State.

Financial Problems

Such affairs as that of Katanga showed that communications had still to be opened up, stations founded, staff appointed, and an armed force equipped in order to police the country. The Government found itself in want of funds to carry out these tasks. King Leopold had continued to finance the Free State as he had the International Association of the Congo, and he still used his own considerable private fortune, but the burden was proving too heavy to be carried. The only revenue which flowed into the state coffers was derived from an export tax, mostly on ivory, and from the issue of certain licences (one exasperated man observed that the only thing which was not licensed was fever), and it proved inadequate for the purposes of government. In 1889 Leopold appealed to the signatories of the Berlin Act for help. They met at Brussels in 1889–1890, and, in order to raise funds for the suppression of the slave trade generally,

agreed to amend the Act and to sanction the imposition of import duties in the Congo and elsewhere. The General Act of the Brussels Conference was signed on 2 July 1890, but owing to various delays its ratification did not take place till 18 March 1891, nor was it put in force until much later. In 1889 the king bequeathed the Free State to Belgium in the event of his death. Next year (1890) the Belgian Chamber, reacting favourably to the gift, granted the Free State an immediate loan of 5,000,000 francs, and 2,000,000 francs per annum for ten years, in all 25,000,000 francs, or in round figures £1,000,000, free of interest. In return for these aids Belgium secured the right to annex the Congo six months after the expiration of the loan with all 'the privileges, rights and advantages, pertaining to the sovereign of that State'.

Exploitation

The Secret Decree of 1891. Meanwhile Leopold was taking private measures to increase the revenue of the State. As early as July 1885, as Sovereign of the Free State, he had issued a decree which declared all 'vacant lands' to be the property of the State without defining what was meant by the word 'vacant'. Later it was interpreted to mean all land other than that cultivated, or actually lived upon, by the natives. Such incredible ignorance of African ideas, an ignorance not confined to the Congo Free State, is hard to forgive.

In September 1891 a secret decree was issued which reserved for the benefit of the State the produce (the rubber and ivory) found on the vacant lands. Confidential instructions were issued to state officials to make this monopoly effective in the north and centre of the territory. The issue of this decree cut at the roots of the constitution of the Free State. The land was no longer free in any sense of the word. The Governor-General of the Congo resigned, other officials in the State and in Belgium registered disagreement with the turn of events, but what, undoubtedly, had greater effect was the attitude of trading concerns who had established themselves in various parts of the territory and who were maintaining a river transport service between stations. Their loud outcries might have led to most unpleasant international complications if something had not been done. The vacant lands were, therefore, divided into three parts. The first part was reserved to the State and became the 'Domaine Privé de l'État'. It was soon to be exploited by state officials. The second part was thrown open to trading companies to be exploited by them. The third was to be reserved provisionally for 'the public security'. It mattered

not whether State or traders operated in an area, the restrictions on the natives remained. They could not leave their homes without a permit.

Again, large areas of the Domaine Privé were leased to companies invested with the exclusive right to exploit the produce of the soil, and the State entered into partnership with some of them. The concession companies were first formed in 1891.

The Domaine de la Couronne and the Fondation de la Couronne. During the period in which King Leopold was occupied with the Arab revolt, and with projects for the annexation of the Sudan, there were other matters which exercised him.

It has already been noted that the territory of the State had been parcelled out into three lots, of which the Domaine Privé was the most important. A fourth lot was soon to be created. Arrangements were made for the creation of a vast reserve or estate, the revenue from which (in the shape of rubber and ivory) was to constitute a private fund. This reserve was named the 'Domaine de la Couronne' and was not alienated out of the Domaine Privé but out of the zone reserved for general trading. The instrument which created the Domaine de la Couronne was registered in 1892, or 1893, in the archives at Boma under the name of the Duc de Saxe-Cobourg-Gotha—one of the king's titles. It was not until three or four years later (8 March 1896) that an official announcement was made that the Domaine de la Couronne had been created. The new private preserve, for such it was, was 112,000 square miles in area. All trading concerns were to be excluded from it, and, in practice, only approved officers of the State were allowed to cross its boundaries. During the next nine years (1892–1901) this 'Fondation', or state within a state, was administered by a specially selected body of officials responsible only to the sovereign. The Domaine de la Couronne lay in the region of Lake Leopold II and the Lukenie river. In the event it was exploited to the fullest extent by Leopold's agents, but first eleven factories of the Société Belge du Haut-Congo were closed down by the orders of Governor-General Wahis. Much that occurred within the Domaine de la Couronne, and all that passed in the administration of the Fondation, still remains a mystery, but it is certain that as a commercial proposition it paid handsomely. It is relevant here to recall that exactly the same difficulties in financing development occurred in French Equatorial Africa. Considerable sums must be expended, and in the Congo Free State these sums had to be found from a single and private fortune.

Concession Companies and Annexation Proposals, 1894. The cost of organizing and maintaining the expeditions which had been dispatched to the Nile and elsewhere by 1894 had made heavy demands on the modest budget of the State; and unfortunately its domestic policy hindered rather than helped a sound budgetary system. In theory the Domaine Privé de l'État should have supplied revenue, but a Belgian author, in writing of this Domaine, says: 'The collection of, or to use a truer term "the raids" for, natural products—more especially rubber and ivory—soon became so intense and were carried out with so little compunction that it could be predicted that the country would be exhausted of a sudden.' He goes on to say that forced labour 'and even the enrolment of slaves' and the attendant 'maladies' of such a system were causing depopulation. He concluded that the policy was fatal. Moreover, since 1891 the concession companies had continued to exploit great tracts of the territory. The Compagnie Anversoise du Commerce au Congo was founded in 1892, also the ABIR (the Anglo-Belgian India Rubber Co.), the leading spirit of which is said to have been a British Colonel, who was a personal friend of King Leopold and was his host at Ostend. The Free State shared the profits of these two companies, which were run by selected agents in official uniform. The profits of the concession companies were considerable. It was estimated that ivory valued at three and a half million francs and rubber to the value of a million francs were sold in Antwerp in the two years after the first commission companies were formed. The cost of collecting these commodities was insignificant, but the profits went to the interests concerned. The country was being bled white, and the Free State itself was in financial difficulties.

At the end of 1894 yet another concession was granted, this time to an Anglo-Belgian company, for the exploitation of the Manyema province west of Lake Tanganyika. The Belgian Parliament sought to intervene. By the terms of arrangements made in 1890 concessions in the Free State could not be granted without the consent of the Belgian Parliament. The Belgian Foreign Secretary therefore represented to the king the difficulties of granting such a concession. The king replied that in spite of the assistance which Belgium had given him four years previously he had been obliged to borrow from a bank in Antwerp in order to finance the State, and that the time had come to repay the debt. If he could not treat with the new concession company he might be obliged to default. He added that if the ministers held to their present attitude he must feel that it was tantamount

to saying that they considered his territory to be a Belgian domain and that they would not allow him to alienate the property of the nation. If this was their opinion, then it only remained for Belgium to put forward proposals for annexation. In 1895 proposals were actually made by the Belgian Ministry concerned for the annexation of the Free State, and about the same time a treaty was made with France which recognized her right of preference over the Congolese possessions in case of their compulsory alienation by Belgium. The Belgian people as a whole were quite unprepared for annexation. The proposal was defeated in the Chamber and the Ministry fell, but as the Chamber voted a further loan to the Free State the financial difficulties of the king were solved satisfactorily for the time being.

The proposal that Belgium should annex the Free State recurred from time to time, but ministers shrank from undertaking such a responsibility inasmuch as it would set them in opposition to the Crown, and might well burden Belgium with financial difficulties which she would find hard to bear. In 1901, that is on the expiration of the 1890 loan, annexation was discussed in the Chamber, but this time the proposal did not come from the Government. The ministers opposed the measure, and the king did not approve of it.

Revolt (Plate 63)

The Arab Revolt of 1892. The Arab revolt of 1886, mentioned on p. 193, was a minor affair easily quelled. Thereafter the Arabs kept the peace for a while, but used it to organize and to consolidate their position between Lake Tanganyika and the Lualaba river. In 1890 Tippu Tib retired to Zanzibar, but not before he had imported arms and ammunition from the west coast. After Tippu Tib's retirement the chosen leaders of the Arabs were Sefu, a son of Tippu Tib, and one Mohara. They soon led their people into open revolt. For one thing Van Kerckhoven's expedition towards the Nile had ruined the chances of Arab slave raiders in the Uele region and Van Kerckhoven had begun to collect ivory. There were other signs. The Free State had been gathering forces and materials. The Arabs knew that fortified camps were being constructed at Basoko, at the mouth of the Aruwimi, and at Lusambo on the Sankuru, from which places operations could be conducted against them in the Lomami–Lualaba area. The State pushed its preparations still farther. Soldiers were recruited in Liberia, and in Lagos, the Gold Coast, and Sierra Leone with the permission of the British Government. Before the Arabs threw off all disguise, their ally Gango Lutete, a native chief of the Batetela,

revolted against the State. He was speedily subdued and from a dangerous enemy he became a powerful ally of the Free State and its most valuable friend among all the natives in the Arab zone.

The final explosion occurred in May 1892, when the members of a commercial expedition were murdered by the Arabs on the Lomami. This expedition was led by a Belgian, M. Hodister, who was also an officer in the service of the Free State. From this time onwards it was war between Arab and the State. The campaign which followed was one of regrettable, if perhaps natural, savagery. On both sides hordes of armed tribesmen, many of whom were cannibals, marched, fought, pillaged, raped, burned, and slew as untamed savages will. It was not until 1894 that the Free State finally defeated the Arabs and was able to extend its hold over all the territory up to the western shores of Lake Tanganyika.

The Revolt of Emin Pasha's Officers. It will be remembered that King Leopold invited Emin Pasha to put the southern Sudan under the Free State. On Emin Pasha's refusal Van Kerckhoven's expedition was dispatched towards the Nile in 1890. The king, recognizing that the Equatorial Province of the Sudan was without a properly organized government (since the withdrawal of the Pasha), determined to occupy it.

He sent officers to the Sudan in June 1891, who persuaded some of the native chiefs in the south to recognize the Free State. In September 1892 contact was made with Emin Pasha's old officers who had been left at Wadelai (north of Lake Albert), and later a fortified camp was constructed at Boru on the Nile. Naturally Great Britain viewed these escapades with anything but favour, but she was not, at that time, in a position to interfere. In 1893 Emin Pasha's officers mutinied and joined forces with the Madhi's dervishes. As a result the position of the Free State troops became untenable. Their withdrawal was closely followed by the dervishes, who crossed the border and invaded Congo territory. They were soundly thrashed by Captain Francqui at Egaru, on 23 December 1894, and retired in disorder to Rejaf on the Nile. The defeat of the dervishes by the Belgians probably saved Uganda from an invasion by the same wild forces.

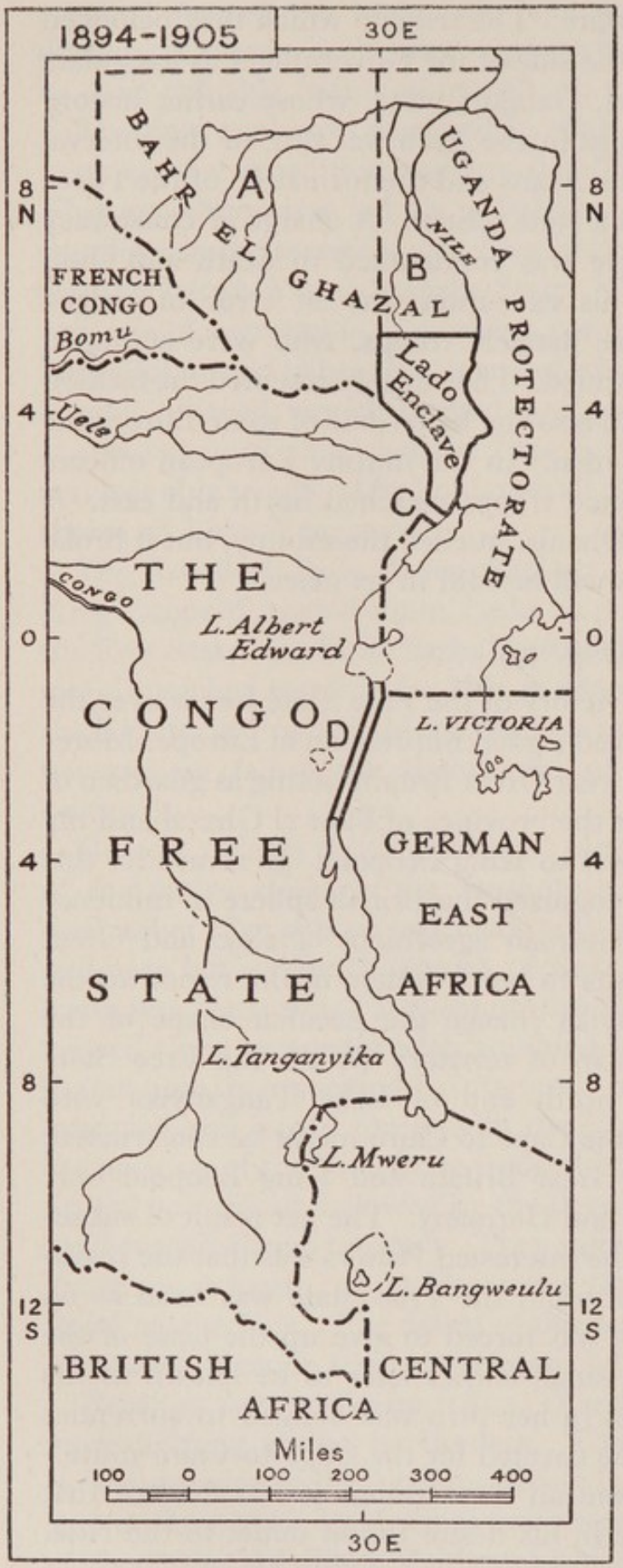
Revolt of Native Troops, 1895. The State had soon to experience more fighting within its borders. The Hausa troops employed in the suppression of the Arab revolt had been repatriated or discharged, and in their place local tribes were recruited for the military forces of the State (the Force Publique). Most of the recruits came from the central regions to the west of Lake Tanganyika and had had

much experience in bush warfare. The tribe to which they belonged (the Batetela) had fought on the side of the Government as irregulars in the Arab war. Their chief, Gango Lutete, whose earlier history has been given, did great things in the Arab war but, in the interval between the suppression of the Arabs and the formation of the Force Publique, managed to offend a state officer. A charge of conspiracy was brought against him. He was condemned to death and shot. It was soon apparent that his execution was an error of judgement. During July 1895 the Batetela troops, who were stationed chiefly on the Lulua river, mutinied. They deeply resented the fashion of the death of their chief, and also the behaviour of some Europeans who interfered with their women. In the mutiny European officers were murdered and the revolted troops marched north and east. A notable Belgian, later Baron Dhanis, quelled the mutiny, but it broke out afresh two years later, as will be told in its place.

The Haut-Uele and the Nile (Fig. 39)

The Bahr el Ghazal. The victory of the Free State forces over the dervishes, late in 1894, produced a good impression in Europe. Moreover on 12 May of that same year Great Britain, acting as guardian of Egypt, had consented to lease the province of Bahr el Ghazal and the port of Mahagi on Lake Albert to King Leopold. In return for this concession, King Leopold recognized the British sphere of influence as laid down in the Anglo-German agreement of 1890 and Great Britain obtained improvements to her frontiers in the region to the south-west of Lake Tanganyika (hence the peculiar shape of the boundary), and a narrow strip of territory within the Free State boundaries connecting the north end of Lake Tanganyika with Uganda so that a road from the Cape to Cairo might be constructed. This arrangement between Great Britain and King Leopold only served to annoy both France and Germany. The net result of subsequent negotiations between the interested Powers was that the boundary between French territory and the Free State was fixed as on the Bomu river, and the king was forced to give up the lease of the Bahr el Ghazal except for a small corner later to be known as the Lado Enclave. Great Britain in her turn was obliged to surrender the strip of country which she coveted for the Cape-to-Cairo route.

Franco-Belgian Plans. From all these things it was evident that King Leopold was not alone in his desire for an outlet to the Nile. Actually France also yearned for the prize, partly because she was seeking to extend her sphere of influence across Africa, and partly



The International Congo Association has now become the Congo Free State. 'Luite Nzige' is known as Lake Albert Edward, but is still wrongly mapped in shape and in position. Kivu is as yet unexplored.

An agreement of May 1894, between Great Britain and the Independent State, provided that:

i. The north-eastern boundary of the State was defined as the watershed between the Congo and the Nile.

ii. The area marked A (a portion of the Sudan) was to be leased to King Leopold of the Belgians and to his heirs, as long as he or they remained sovereigns of the Congo Free State, even if the latter became a Belgian Colony.

iii. The area marked B was to be leased to King Leopold for the period of his reign only.

Owing to French influence, King Leopold occupied no more of these areas than the Lado Enclave. The leases of areas A and B were annulled in 1906. The Enclave was occupied until 1910.

In return for the above the Congo Free State:

iv. Was to lease to Great Britain a strip of territory, D, 15½ miles, or 25 kilometres, wide, connecting the north end of Lake Tanganyika with Lake Albert Edward.

This lease was annulled on 22 June 1894 owing to the opposition of Germany.

v. Was to agree to a rectification of the boundaries in the south-east. Compare Fig. 38 and Fig. 39.

After these agreements had been made, and largely annulled, an agreement between the Congo Free State and France (14/8/1894) defined the boundary between them as the Bomu river, from its junction with the Ubangi eastwards.

In 1910 the Mahagi strip (shown at C), 15½ miles, or 25 kilometres, wide, was leased to Belgium. It gave the Belgian Congo access to Lake Albert and the Nile, including Mahagi port on the lake. This lease is shown on Fig. 39, instead of Fig. 40, in order to show, on the latter, a subsequent modification of boundary in this area.

FIG. 39. *The north-eastern and eastern boundaries of the Congo Free State between 1894 and 1905.*

because she thought that if she was firmly established on the upper Nile she could regain her lost prestige in Egypt. In 1895 Baron Dhanis was speaking openly of two Belgian columns which were to advance north from the Free State to attack the dervishes on their own ground, and precisely at the same time Marchand's dash to Fashoda was being prepared. When Marchand arrived at Brazzaville, on his way to Fashoda, the Free State helped him as far as it could by lending him transport. The government steamer *Ville de Bruges* was put at his disposal and made two trips up the Ubangi river with details of the expedition. Towards the end of the next year (Sept.–Oct. 1896) Dhanis set in motion the troops about Stanleyville which were to advance to the Sudan. The advance guard was ordered to proceed to Avakubi on the Aruwimi, up that river to Kavali, thence to Kilo and so north to the Nile. About the same time Captain Chaltin left Dungu on the Uele with 700 men.

The Batetela Mutiny. After four months' marching Dhanis's advance guard reached Dirfi, and there, on the borders of the Free State and Bahr el Ghazal, the Batetela troops refused to march and once more broke out in revolt (Feb. 1897). They massacred their officers and turned south. Baron Dhanis hurried to the Aruwimi and tried to prevent the passage of the mutineers. He was heavily defeated, such troops as he had were scattered, and with a few officers he made his way to Stanleyville, which was hurriedly put in a state of defence. The Government was thoroughly alarmed and breathed a sigh of relief when the mutineers, after avoiding Stanleyville, turned eastward and overran the region of the Manyema. It will be as well to anticipate and conclude the history of the Batetela. Some of them made their way northwards towards Uganda, where Sudanese troops in British service had also mutinied. Obviously the intention was to join hands with the Uganda rebels, but the movement failed and the wretched mutineers drifted from place to place hungry and sick. It was not until 1901 that the last flickers of revolt died down.

Fashoda. To return to the Nile: although the Free State had suffered a serious reverse at the hands of the Batetela, Chaltin's force scored a compensating success by advancing from Dungu to the Nile at Rejaf. Rejaf is opposite the old Egyptian post of Gondokoro and was occupied in February 1897. Marchand occupied Fashoda on 10 July 1898, and on 19 September Lord Kitchener arrived post-haste, fresh from his victories over the dervishes at Atbara and Omdurman. The subsequent negotiations between France and Great Britain concerning Fashoda, and the happily averted threat of a

European war, form no part of the history of the Congo. When in 1899 France renounced all territorial ambitions in what had been a province of the Egyptian Sudan, King Leopold revived his claims to the Bahr el Ghazal under the terms of the agreement of 1894. Great Britain declined to renew the lease and much negotiating followed. In 1904 another Free State armed force was sent to the province. The Sudan Government replied by issuing a proclamation which had the effect of cutting off the Congo stations from communications with the Nile. Posts and provisions did not arrive and the king had to give in. Finally in 1906 it was agreed that the Bahr el Ghazal was a part of the Sudan, and could not be tacked on to the Free State, but King Leopold was allowed to retain the lease of the Lado Enclave for the period of his own reign.

The Congo 'Atrocities'

Awakening of Public Opinion

World opinion began to be vocal. Travellers who passed through the State and missionaries who resided there were not silent. Shocking tales concerning the treatment of the natives began to reach the ears of the public in Great Britain and America. In 1896–1897 articles inimical to Free State administration appeared in the *Century Magazine*. In 1896 also the Aborigines' Protection Society of Great Britain urged the British Government to champion the cause of native races in Africa, especially those in the Congo basin. In 1903 the same society published *Civilization in Congoland, a story of International Wrong-doing*. These were the beginnings of a widespread agitation against the Free State.

The Facts

In reading the history of Africa the adage that 'people who live in glass houses should not throw stones' must be constantly in mind, and the history of the Congo can be no exception to this salutary rule. Consequently it will be well to let a Belgian speak for the Free State: M. Wauters, a noted geographer, in his *Histoire Politique du Congo Belge* (Brussels, 1911) wrote:

'Tax was not paid in money but in work. In the rubber districts in place of work the tax was assessed at so many kilogrammes of rubber. If the stated quantity was not delivered to the "Treasury" there were several methods of enforcing compliance. Chiefs were detained as a punishment until their people furnished their quota of rubber; hostages were

taken; women and children imprisoned; the chicotte (a raw hide lash) was used on those who had not brought in to the post their prescribed amount of rubber. Sentinels were posted in centres of population to supervise the work of the natives. Refractory villages received visits from military patrols. At times punitive expeditions were sent to mete out exemplary punishment. Villages were burnt. . . . Savage instincts were revealed . . . .'

There is no need to continue the dire tale of horrors, but M. Wauters points out that 'the practical application of such a system was aggravated by a promise of commission to European agents who collected the most ivory and rubber or who recruited the most "free labour" '. He then quotes a government circular setting out the tariff of commissions, and says that later commissions gave place to pensions for the agents who proved themselves 'les plus distingués'. Can it be wondered at that men of poor education, from whom the agents of varying nationality were not infrequently recruited, sought to improve their financial position? Be it said to the credit of some officers that they sought to be just and humane, but whether just or unjust all agents were goaded on from above. The 'atrocities' were not universal throughout the length and breadth of the territory. Nothing was reported from Bas-Congo; a voyage from Stanley Pool to Stanley Falls might reveal little amiss; but in lonely distant districts grievous and terrible was the fate of the natives. The Congo atrocities were not a mere catchword nor were they propaganda for the purpose of advancing the interests of any party or person.

Motion in British Parliament, 1903

. These things could not be hid, and in the House of Commons on 20 May 1903 voices were heard denouncing the administration of the Free State, and charging it with gross cruelty to the natives and with violation of the Berlin Act. Mr. Balfour, replying on behalf of the Government, observed that a friendly Power could not be condemned out of hand on the evidence of a few persons without a fuller inquiry into the charges made against it. However, a motion was passed without a division which desired 'His Majesty's Government to confer with the other Powers, signatories of the Berlin General Act, by virtue of which the Congo Free State exists, in order that measures may be adopted to abate the evils prevalent in that State'.

In the following month of June the German Colonial Society prayed the Chancellor of the Empire 'to take action at once, with the other signatory powers of the Conference of 1885, with the object of compelling the Congo State to respect the articles of the Berlin

Act which up to the present she has violated. . . '. Neither the Chancellor of the Empire nor any of the signatory Powers took enough notice of the Commons' resolution or the German Colonial Society's petition to cause a flutter in the Free State dovecots.

The Casement Report

But the British Government took some action. They ordered the British Vice-Consul in the Congo, Mr. Casement (later Sir Roger Casement), to make a tour of inspection and to report on what he saw. Casement, who earlier in his career had been an officer under the International Association, left Matadi on 5 June 1903 and returned to Leopoldville on 15 September. His report appeared in December. It confirmed all that had appeared in the press and had been said in Parliament concerning the state of affairs in the Congo. It brought to light more details of abuse and maladministration.

The report was received with indignation both in Great Britain and Belgium. In July, a League for the defence of 'Belgian Interests from Foreign Interference' was formed in Brussels by the party friendly to the interests of the Free State, but it must be recorded that this party was not without bitter and outspoken opponents in Belgium. The President of the League was M. Wahis, the Governor-General of the Independent State. Forces were mustering on either side and a long and bitter controversy was to ensue.

The Congo Reform Association of Great Britain

In February 1904 Mr. E. D. Morel founded the Congo Reform Association. He was a Liverpool man who had lived in Antwerp and Brussels as the agent of a shipping line which did business with the Congo. While resident abroad he was moved to take up cudgels with the Free State and determined to expose to the world what he considered to be a criminal system.

The Congo Reform Association organized meetings in important towns in Great Britain at which perhaps a member of Parliament or a returned missionary from the Congo would give testimony against its administration. There were Congo Reform meetings in which ill-informed or ill-digested opinion was vented as fact, as always happens on such occasions, but on the whole the crusade, for such it appeared to be, was kept within bounds of decorum. Later, when Morel produced a volume setting out in detail the charges against the State, its title *Red Rubber* was taken as the slogan of all ardent reformers.

Further Action by Parliament

In June 1904 'the Congo question', as it had now become, was discussed once more in Parliament. The Foreign Secretary referred to the indignation aroused in Parliament and in the country and stated that the Government was watching the interests of the natives and its own nationals with great attention.

At the same time a Blue Book was issued containing a copy of all the documents which had passed between the respective governments with regard to the Congo. Among them was one which contained a proposal from Lord Lansdowne to the effect that the Free State itself should institute a commission of inquiry into the state of affairs said to exist within the State.

The Commission of Inquiry, 1904–1905

King Leopold, thereupon, took action. He ordered that a commission should be sent to the Congo to inquire into the state of affairs within the borders of the Free State. Three commissioners were appointed. They were M. Edmond Janssens, a Belgian and Deputy Director of Public Prosecutions (Avocat Général), Baron Nisco, an Italian, President of the Court of Appeal of the Congo, and M. Edmond de Schumacher, a Swiss, Chief of the Department of Justice of the Canton of Lucerne. The commissioners arrived at Boma in October 1904 and remained for four months in the Free State. They visited Lake Tumba (in the Domaine de la Couronne), Coquilhatville, a concession of the ABIR on the Lulonga river, and finally Stanleyville. They collected evidence from state officials, missionaries, factory superintendents, and natives, and prepared a report which was signed on 30 October 1905.

In their report the commission paid tribute to the greatness of the work accomplished in the Congo, the high character of its architects, and the extraordinary results obtained. In spite of all this, however, the commission confirmed that grave abuses were prevalent in the upper Congo and made recommendations designed to remedy the evils. The commissioners thought that unpaid labour was necessary in order to develop the natural riches of a new country, but that the period of such labour should be strictly limited to 40 hours a month. They recognized the urgent need for a more liberal interpretation of the land laws, with their absurd definition of vacant land. They confirmed the principles of the concession system, but they were of the opinion that concession companies should not have the

right to force natives to work for them. Military expeditions, they maintained, should be properly regulated. They held that law courts must be freed from administrative interference. They roundly condemned the 'sentinel' system, whereby native soldiers were sent to villages to 'encourage production'.

Not long after this report was presented the king issued a decree appointing a commission of fourteen members to study the recommendations made by the commission of inquiry. As a result of their studies, on 3 June 1906 he signed another decree which purported to make changes in the administration of the Congo. This was called the Reform Decree.

The two years following the signing of the Reform Decree were politically stormy and sometimes tempestuous. In England newspapers and the Congo Reform Association continued to inveigh against the Free State and continued to carry the public with them. In the House of Commons voices were heard crying for drastic action in the matter, for it was apparent that the 'reforms' had accomplished, and were accomplishing, nothing. In Belgium and in France movements similar to the Congo Reform Association were enlightening public opinion. In the United States the agitation against the Free State increased in volume and intensity. Finally the British Foreign Secretary announced that the patience of His Majesty's Government was not inexhaustible.

The Climax

The Belgian Government was then compelled to recognize the fact that sooner rather than later the Belgian nation would be obliged to assume responsibility for the Free State.

King Leopold also felt the same, and in November 1907 a treaty was signed by his own nominees, both for Belgium and the Free State, for the cession of the Congo to Belgium. The terms of this arranged treaty could not be accepted. They stipulated among other things that all the privileges of the 'Fondation de la Couronne' were to remain, although Belgium was to have the right of redemption, which would have cost the country about £8,500,000.

Meanwhile, in February 1908, the British Consul in the Free State, Mr. E. Thesiger, reported, concerning the labour tax, that the system which had given rise to abuses continued unchanged and that so long as it remained unaltered the condition of the natives would remain one of veiled slavery. At the same time Sir Edward Grey, who was Foreign Secretary, declared in the House of Commons that

'the Free State had morally forfeited every right to international recognition'. This was the peak of the crisis.

The Belgian Congo

(Fig. 40)

Annexation

In Belgium feelings had never run so high in Parliament. Discussions on annexation and the Treaty of Cession commenced in April 1908; they were interrupted by an election, and were concluded in July. Finally on 9 September 1908 the Senate passed a bill for the annexation of the Congo; 63 votes were cast in favour of annexation, 24 were against it. It was enacted on 18 October.

On the same date a law was passed which is commonly known as the 'Colonial Charter' or the 'Colonial Law' by which a Ministry for the Colonies was established. But more important than this, the Charter defines the functions and powers of the legislative and the executive elements in the administration of the Belgian Congo.

On 15 November 1908 Belgium assumed control over the Independent State of Congo and King Leopold's personal rule was at an end. There was no ceremony to mark an historic fact. A bare announcement was posted up at Boma, then the capital of Congo, which read: 'I have the honour to make known to all officers of the Independent State and to all Europeans and other non-natives, as well as to the whole Congolese nation, that, from 15 November 1908, Belgium assumed sovereignty over all the territories within the Independent State of Congo.' The announcement was signed by an Inspector of State.

The War of 1914–1918

The next few years were a period of comparative quiet for the Congo. Its new mistress, Belgium, is not a large country. Its total population in 1908 was not any larger than that of Greater London, and it had not possessed any colonies heretofore. Under such conditions it was difficult to find a body of trained Belgian administrators who could take the place of those numerous foreigners who had held authority under the regime of the Free State. Among the army officers were Danes and Swedes. The officers of the river flotillas were generally Scandinavian, though it is interesting to recall the fact that Joseph Conrad commanded a sternwheel steamer for a short time. There were Italian doctors and Italians in the judicial department.



FIG. 40. *The latest adjustments of the eastern boundaries*

The Congo Free State has become the Belgian Congo; German East Africa has become Tanganyika Territory; British Central Africa, Northern Rhodesia; and French Congo, French Equatorial Africa.

In 1906 a Boundary Commission demarcated the boundary between Congo and Uganda about Lake Edward (A on the Fig.), which now appears in its true position. Uganda gains some territory (compare with Fig. 39 where the international boundary coincides with the 30th meridian).

In 1914 Uganda and the Anglo-Egyptian Sudan rectified their mutual frontier, transferring to Uganda the Lado Enclave.

In 1915 an agreement was made with respect to the boundary about Lake Albert (shown at B). The country between the western shores of the lake and the Congo-Nile watershed was ceded by Uganda to Belgian Congo, and the boundary became the centre of the lake.

The boundary between the Mandated Territories of Ruanda-Urundi and Tanganyika Territory was demarcated by an Anglo-Belgian Commission in 1922 (C on the Fig.), whilst that between Ruanda and Uganda had been settled by an Anglo-German Commission as early as 1902–1904.

Let it be said at once that these officers for the most part behaved with exemplary propriety during their tours of service, but the difficulty remained that a Belgian colony was largely administered by foreigners, a fact which hurt national pride. However, by 1911 the colony seemed to be in a good way; a new impetus had been given to trade by the opening of a great palm-oil industry through the enterprise of Messrs. Lever Brothers. The Katanga copper-mines were developing, and all seemed set for steady progress when, in 1914, war descended on the colony as well as on Belgium.

Naturally war raised a problem. The Berlin Act had imposed neutrality on the whole Congo basin. However, treaties were broken by Germany, not only in Belgium but in central Africa. In spite of the wish, expressed by Belgium, that hostilities in Africa should be avoided, the Belgian Congo was soon involved in operations. In 1914 the Belgians and French were facing Germans from the Cameroons on the Sanga river. The Belgians and British were also facing the same enemy on Lake Tanganyika. With some help from a tiny flotilla from the British Navy and from British forces in Rhodesia, Belgian native troops protected the west shore of Tanganyika, although the Germans had a far superior naval force on the Lake. Furthermore, they were able to complete the railway from Kabalo, on the Lualaba, to Albertville. In 1916 Belgian troops captured Kigoma in German East Africa. A few months later Tabora fell to them. Continuing the campaign in 1917 after the rains, Belgian columns captured Mahenge, south of the Kilombero river. One battalion of Congolese native troops reached Lindi on the Indian Ocean. At the close of the war Belgium was in occupation of the countries of Ruanda and Urundi in the north-west as well as of a great part of what is now the Kigoma district of the western province of Tanganyika Territory.

Ruanda and Urundi

The decision of the Supreme Council at Versailles on 7 May 1919, allocating all of German East Africa to Great Britain under mandate, aroused great resentment among Belgians, and led to a strong protest from the Belgian Delegation at Paris. They claimed, and claimed rightly, that they were in effective occupation of part of German East Africa and had also assisted in expelling the Germans from a great deal of the rest of that country. Also the part now occupied by Belgian troops was suitable for white settlement and for raising cattle, advantages in which the Congo was grievously lacking. Accordingly the question was reopened and left to negotiation between Great

Britain and Belgium, subject to the approval of their decision by the Supreme Council. On 31 May an agreement was reached between the British and Belgian representatives by which Belgium was to receive, under mandate, nearly all of the native states of Ruanda and Urundi. A boundary between the two mandates, Tanganyika and Ruanda-Urundi, was demarcated in 1923–1924, and Belgium has continued to administer two of the richest and most thickly populated provinces of the old German colony (Fig. 40).

After the War Problems

The policy of the past has created many administrative difficulties in the present for the Belgian Congo. The country in which black labour was held to be inexhaustible, has proved to be like virgin soil fresh turned which produces a magnificent crop for two or three harvests and then loses all its powers. By 1920 the Colonial Government was seriously concerned about the question of man-power. Grave fears of the exhaustion of labour led to the appointment of two commissions. The first sat in 1924 and the second in 1928. Broadly, the conclusions of the commissions were that the amount of development in all regions of the Congo must be in direct proportion to the amount of labour available locally. They laid down that no more than 25 per cent. of the male inhabitants of a locality could be employed on paid work, whilst the rest must be left to attend to their own farms and plantations. Further it was ruled that of the 25 per cent. only one-fifth could be recruited for work at a distance from their villages, and that another fifth might work within 2 miles of their homes. The remainder must be employed at their homes if they were to be employed at all. Actually, in 1930, about 16 per cent. of the able-bodied male population were employed by European enterprises.

A Belgian author, M. Loumers, commenting on the general situation in the colony a few years ago, said that 'the colony exhausts its resources in artificially maintaining enterprises which leave little real wealth in the country. Production goes on, but the small profits, when there are any, go to pay the interest (and that a low rate) on capital to investors outside the colony. The mass of people . . . cannot enrich themselves nor raise, to any considerable degree, their standard of living. . . .'

It was, therefore, an historical day for the Congo when on 25 July 1933 the present King of the Belgians, then Duke of Brabant, made a speech on colonial policy to the Belgian Senate. He said that a prosperous native peasantry, able to acquire property and to enjoy

economic freedom, must be the goal of all Congo policy. Subject to existing established interests, and for a certain number of years, the Government ought not to grant further concessions in districts capable of agricultural development. It was necessary to reduce to their true proportions the estimates of the producing capacity of tropical lands and of the labour force available for their development. European activities in agriculture should be restricted to those not within the scope of native capabilities, e.g. scientific research, purchase of products, processing, transport and export services. He added that the colonies which had proved best able to meet the economic disturbances (of 1931) were those in which the development of the land was entrusted mainly to natives.

So the wheel has turned half-circle in Congo. From thoughtless and destructive exploitation of natural products by forced labour to a policy of peasant proprietors, and from conditions little better than slavery to a labour policy which but few legislatures would be bold enough to enact. Katanga is highly industrialized. Its native camps and hospitals for the mine-workers are the envy of some, and models for all, employers. There are well-run plantations and factories on the Congo river and the Kasai with similar facilities. Gold is mined in the north at Kilo, where labour is carefully employed.

Man-power is needed for all these enterprises, as well as for transport and other utility services; otherwise the greatest part of this vast country remains to be developed by the native himself for himself. This, then, has been the avowed policy of the Belgian Government. The energy and success with which this policy has been pursued have earned the admiration of the colonial Powers.

War Again

According to the Colonial Charter, and to the Belgian Constitution, the government of the Congo, in the absence of the king, could be exercised by his Colonial Minister and by the Governor-General. One of the first initiatives taken by the Belgian Cabinet after the collapse of France was to send to London the Colonial Minister, M. de Vleeschauwer, with full powers to organize the resistance of the Congo in collaboration with Great Britain. At the beginning of July 1940 the position of the colony and its future contribution to the common cause were made perfectly clear.

The attitude of the Governor-General, M. Ryckmans, was no less resolute. In September 1940 he was able to declare that the National Army (13,000 strong in pre-war days) had been considerably re-

inforced, and that fuller measures were under discussion with the British military mission, recently arrived at Leopoldville. The strategic position was improved in October 1940 by the contacts established with General de Larminat, Governor of Free French Equatorial Africa.

Once again Belgian native troops have fought with distinction against the threat to freedom. The airways, waterways, and roads of the Congo have already proved invaluable, whilst its produce helps to redeem Allied losses in the East. But the full tale of co-operation must wait for a future historian.

APPENDIX TO CHAPTER VIII

PRINCIPAL BOUNDARY AGREEMENTS (Fig. 41)

Congo Free State

1876. Creation of an International African Association at a Conference summoned by King Leopold II of Belgium. This Association did not last.

1878. Creation by King Leopold, from the Association, of the Comité d'Études du Haut-Congo, which afterwards changed its name to the International Congo Association, and ultimately developed into the Government of the Congo Free State. It was formally recognized as a State in 1884 by the United States (22 Apr.), Germany (8 Nov.), Great Britain (16 Dec.), Italy (19 Dec.), Austria-Hungary (24 Dec.), Holland (27 Dec.); and in 1885 by Spain (7 Jan.), France (5 Feb.: frontier on lower Congo defined), Russia (5 Feb.), Sweden and Norway (10 Feb.), Portugal (14 Feb.), Belgium (23 Feb.), and Denmark (23 Feb.).

1882–4. Treaties between the Belgian Expedition to the upper Congo and native chiefs.

1884, 26 Feb. Treaty between Great Britain and Portugal, assigning the Congo mouth to Portugal (withdrawn).

Apr.–May. Notes exchanged between France and the International Congo Association, according rights of pre-emption to France.

16 Dec. Convention between Great Britain and the International Association, providing for British consular jurisdiction, &c.

1885, 5 Feb. Convention with France, for the cession of certain private stations and properties to France.

14 Feb. Convention between Portugal and International Association respecting boundaries.

23 Feb. Announcement to the Berlin Conference that the name of the International Association of the Congo had been changed to the Independent State of the Congo ('Congo Free State').

1885, 26 Feb. General Act of the Conference of Berlin ('Berlin Act'), establishing free trade in the conventional Congo basin (Fig. 37), and defining its boundaries.

Accession of the Congo Free State (still under the name of the International Congo Association) to the Berlin Act.

1 Aug. Notifications by King Leopold to the Powers, of the formation of the Congo Free State.

Circular of the Congo Free State, defining its boundaries and declaring its neutrality.

22 Nov. Protocol, with France, for delimitation of the Manyanga region.

1887, 22–9 Apr. Exchange of Notes with France, recognizing Belgium's superior right of pre-emption.

29 Apr. Protocol, with France, for delimitation of the Ubangi region.

1890, 1 July. Agreement between Great Britain and Germany regarding spheres of influence. It recognized the British sphere as bounded on the west by the Congo Free State and by the western watershed of the basin of the upper Nile. (Fig. 38.)

2 July. General Act of the Brussels Conference, providing better means for the suppression of the slave-trade, and restricting the trade in arms and in liquor ('Brussels Act').

Declaration by signatories to the Berlin Act, sanctioning import duties within the Congo basin, not to exceed 10 per cent. *ad valorem*.

3 July. Convention with Belgium, providing for a loan to the Congo Free State and giving Belgium the right to annex in 1901.

1891, 25 May. Treaty with Portugal, for delimitation of the Lunda region.

Convention with Portugal, for the settlement of frontiers on lower Congo.

1894, 24 Mar. Joint Declaration with Portugal, approving delimitation of Lunda region.

12 May. Agreement with Great Britain, whereby the Free State recognized the British sphere of influence as laid down in the Anglo-German Agreement of 1 July 1890, and leased to Britain a strip between Lakes Tanganyika and Edward, in return for a lease of the Bahr el Ghazal, &c.; and the boundary to the north of the Zambezi was defined. (Fig. 39.)

22 June. Declaration by the same Governments, cancelling the agreement for the lease to Britain.

14 Aug. Boundary Agreement with France, as to Bomu river and Congo and Nile basins.

1895, 9 Jan. Treaty for the cession of the territory of the Congo Free State to Belgium (withdrawn).

1895, 11 Jan. Declaration of the neutrality of the Congo Free State as delimited since the Circular of 1 Aug. 1885.

5 Feb. Arrangement with France, respecting the French right of pre-emption (in view of the proposed transfer of the Congo to Belgium).

Agreement with France as to Stanley Pool.

1906, 9 May. Agreement with Great Britain, annulling lease of the whole Bahr el Ghazal, but confirming lease of part (Lado enclave) for the lifetime of King Leopold II and six months after his death. (Fig. 39.)

Belgian Congo

1907, 28 Nov. Treaty for cession of territory of the Congo Free State to Belgium.

1908, 18 Oct. Belgian Law approving the Treaty of Cession.

Belgian Law providing for the government of the Belgian Congo ('the Colonial Charter').

4 Nov. Order by the King of the Belgians, fixing 15 Nov. 1908 as the date on which Belgium would assume sovereignty (the annexation of the Belgian Congo by Belgium has been recognized by all the Powers).

23 Dec. Agreement with France, respecting the French right of pre-emption over the territories of the Belgian Congo (renewing the Arrangement of 5 Feb. 1895, which, in consequence of the withdrawal of the Treaty of Cession of 9 Jan. 1895, had not been ratified).

Declarations by France and Belgium, relative to the delimitation of the French and Belgian territories on the Congo. These completed the Agreements arrived at by the Convention of 5 Feb. 1885, Protocols of 22 Nov. 1885 and 29 April 1887, and Boundary Agreement of 14 Aug. 1894.

1909, 17 Dec. Death of King Leopold II.

1910, Apr.–June. Agreement with Portugal, by exchange of letters, defining the Belgo-Portuguese frontier.

10 May. Agreement with Great Britain, ceding the western shore of Lake Albert to Belgium, thus securing access to the Nile, which would otherwise have been lost through the surrender of the Lado enclave to the Sudan consequent on the death of King Leopold II.

14 May. Protocol, with Great Britain and Germany, providing for delimitation of frontier in north-east of the Belgian Congo.

15 June. Declaration by signatories to Berlin Act, authorizing import duties exceeding 10 per cent. upon arms and ammunition.

16 June. Recession of Lado enclave to Anglo-Egyptian Sudan in terms of agreement of 9 May 1906.

1910, 11 Aug. Protocol, with Germany, defining frontiers with German East Africa (ratified in 1911).

1911, 14 May. Protocol, with Great Britain, defining frontier in north-east of the Belgian Congo.

1913, 5 July. Protocol, with Portugal, defining boundary on lower Congo (R. Kwango to Noqui).

1914, 1 Jan. Exchange of territory between Uganda and the Sudan, by which the southern part of the Lado enclave was transferred to Uganda.

1915, 3 Feb. Convention with Great Britain, defining frontier on the north-east of the Belgian Congo.

1919, 10 Sept. Convention of St. Germain-en-Laye, by which the restriction on duties in the Congo basin was removed, but all members of the League of Nations and the United States must be treated alike.

Additional Convention of St. Germain-en-Laye, relating to the control of liquor traffic in Africa.

1921, 15 Mar. Convention with Great Britain, granting concessions to Belgium at Dar es Salaam and Kigoma, and exempting traffic to and from Belgian Congo and Ruanda-Urundi from Tanganyika custom duties.

1926, 25 Sept. International Convention on the subject of Slavery.

1927, 19 Mar. Agreement with Great Britain, for the demarcation of the boundary between Northern Rhodesia and the Belgian Congo.

21 July. Convention with Portugal, regarding Belgian traffic through Angola, and for the construction of a Belgian line to connect with the Benguela railway.

22 July. Convention with Portugal, under which Belgium ceded to Angola 480 square miles in the south-west of the Congo Colony (the 'Dilolo boot'), receiving in exchange a strip near Matadi, required for the rebuilding of the Matadi–Leopoldville railway.

1929, 1 Oct. Protocol, with Great Britain, containing the decisions of British and Belgian Boundary Commissioners, for the demarcation of a section of the boundary between Northern Rhodesia and the Belgian Congo.

1930, 24 Feb. Additional Protocol, relating to the same boundary.

1933, 7 Apr. Exchange of Notes with Great Britain, confirming the Protocols of 1 Oct. 1929 and 24 Feb. 1930.

Ruanda–Urundi

1884–90. German Protectorate established in East Africa (consequent on treaties between native chiefs and German chartered companies).

1885. Berlin Act (*see* Belgian Congo).

1890. Agreement between Great Britain and Germany, delimiting frontiers of German East Africa (*see* Belgian Congo).

Brussels Act (*see* Belgian Congo).

1910. Boundary Protocol between Great Britain, Germany, and Belgium (*see* Belgian Congo).

1919, 7 May. Decision of the Supreme Council of the Allies, assigning the Mandate over the whole of German East Africa to Great Britain (Belgium protested and negotiations ensued between Belgium and Great Britain).

31 May. Convention with Great Britain, agreeing that Belgium should receive the Mandate over Ruanda-Urundi.

28 June. Treaty of Versailles. By Article 119, Germany renounced in favour of the principal Allied Powers all her rights over her overseas territories, including German East Africa.

21 Aug. Ratification by the Supreme Council of the Allies of the Convention of 31 May 1919.

10 Sept. Conventions of St. Germain-en-Laye (*see* Belgian Congo).

1921. Convention with Great Britain, facilitating traffic to and from Ruanda-Urundi (*see* Belgian Congo).

1923, 18 Apr. Treaty with the United States, regulating American relations with the mandated territory.

3 Aug. Notification to League of Nations of Agreement between Great Britain and Belgium for rectification of frontier of Ruanda.

31 Aug. Mandate to Belgium finally approved by the League of Nations.

1924, 21 Jan. Protocol amending Article I (boundaries) of the Treaty with the United States.

5 Aug. Protocol signed at Kigoma by British and Belgian Boundary Commissioners, demarcating the boundary between Tanganyika Territory and Ruanda-Urundi, confirmed on 17 May 1926 by an exchange of notes between the two Governments.

20 Oct. Belgian Law approving Mandate.

1925, 21 Aug. Belgian Law uniting Ruanda-Urundi administratively with the Belgian Congo.

1926, 11 Jan. Order by the King of the Belgians, bringing Law of 21 Aug. 1925 into operation.

25 Sept. International Convention regarding Slavery (*see* Belgian Congo).

1934, 22 Nov. Treaty with Great Britain, adjusting the boundary with Tanganyika Territory.

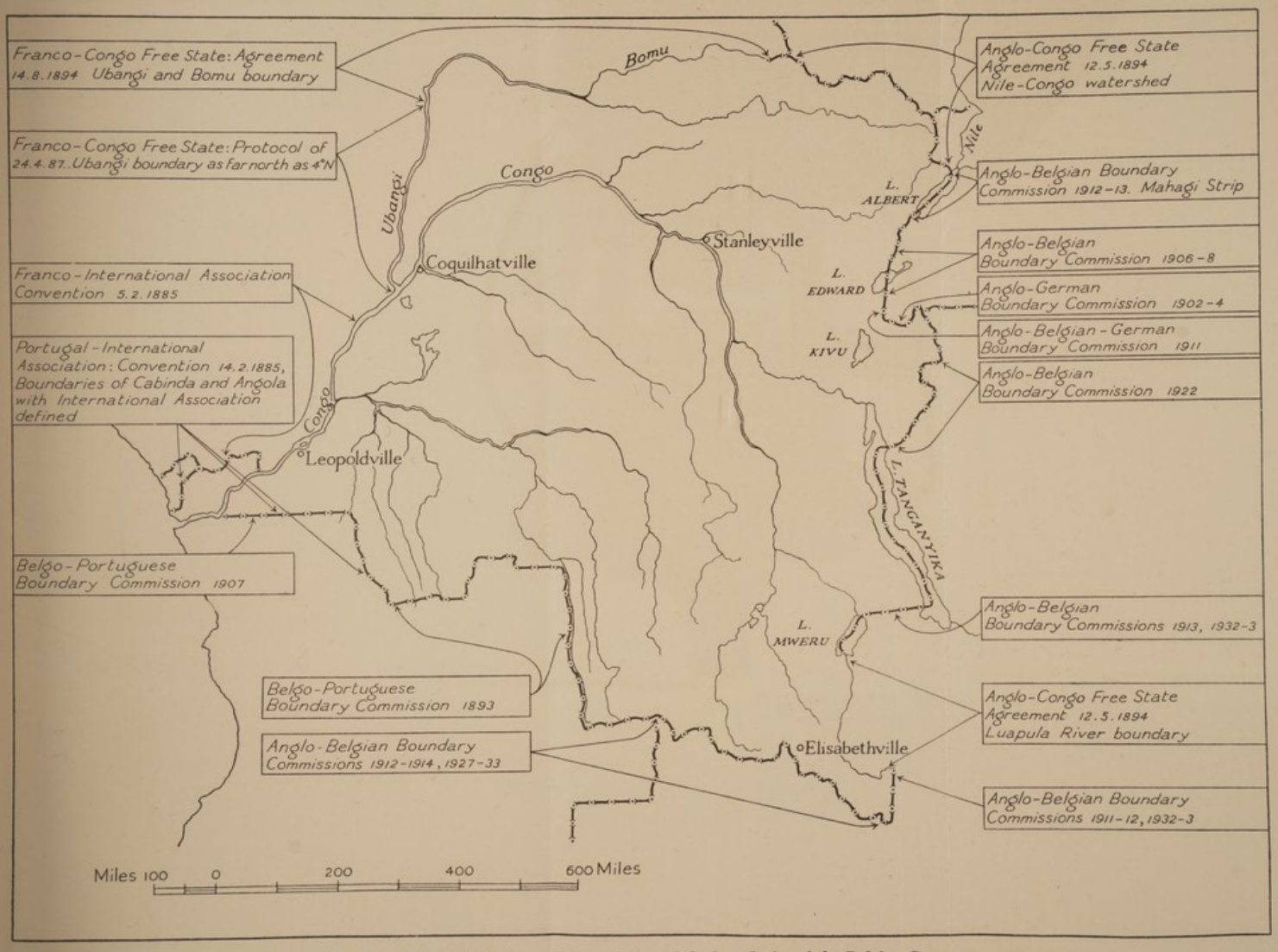


FIG. 41. *The delimitation and demarkation of the boundaries of the Belgian Congo*

CHAPTER IX

ADMINISTRATION

THE original Constitution of Belgium did not provide for the administration of colonies, as the country had none. In 1885 the Congo Free State was founded, with the King of the Belgians as its sovereign, but his two roles were quite distinct and the Free State was independent of the Belgian Parliament. By 1893 it was becoming more and more evident that Belgium would have to take over the Congo, but it was also plain that Belgian laws would be unsuitable. The Belgian Constitution, therefore, was altered by making this amendment:

'The colonies, overseas possessions and protectorates which Belgium may acquire are governed by special laws.'

The territory was finally acquired, as a Belgian colony, by treaty, in 1907, and the fundamental principles of its government were laid down in an Act of Parliament commonly known as the Colonial Charter. After the War of 1914–1918, the whole of German East Africa was allocated to Great Britain. Subsequently Britain agreed that Ruanda-Urundi should be mandated to Belgium. The effect of the mandate is to allow Belgium to administer the territory as part of the Belgian Congo. The Belgian Parliament considered it unnecessary to give Ruanda-Urundi a 'charter', but contented itself with passing, in 1925, an Act constituting the new territory and applying in principle laws of the Belgian Congo. The portion of Africa, therefore, which is administered by Belgium consists of a colony to which has been added a small mandated territory. Before giving a short description of the administrative and legislative systems it may be useful to consider the differences between the British and the Belgian methods.

The fundamental difference between Belgian and British colonial administration arises from the difference in the constitutions of the mother countries. Belgium is a modern state, and, like all states which owe their existence to recent political revolutions, has an organization which was planned in advance and set out in the articles of a written constitution, whereas the United Kingdom evolving from precedent has no bed-rock constitutional document. Magna Carta is but a guarantee of private rights. So, the British colonial empire has been created, bit by bit, by Orders in Council and Letters

Patent, establishing colonies and protectorates, creating local legislatures of various sorts and letting them work out their destinies, with varying degrees of control. Belgian Congo, on the other hand, started with a constitution contained in an Act of the Belgian Parliament, rather in the way that the British Parliament launched the Dominion of Canada, the Commonwealth of Australia, and the Union of South Africa. The Belgian Congo, however, is not left to govern itself, but the Parliament which constituted it continues to legislate for it on certain matters. It is a peculiarity of the Belgian system, and a point on which it differs from the British and the French, that the annual budget of the colony is discussed and passed in Parliament. This is due to the anxiety of Parliament to keep the affairs of the Congo under its direct control and to avoid practices which obtained in the Congo Free State, and it is made possible because the Congo is Belgium's one ewe lamb.

The legislative system will be dealt with in its place, but, as legislation is a function of administration, it may be observed here that the chief difference between British and Belgian systems is that most legislation for the Congo is passed in Brussels and sent out cut-and-dried to Leopoldville, whereas, in British colonies, most of the law is made on the spot and sent home for approval. The difference is more apparent than real, as the British Secretary of State frequently sends an ordinance in draft to a Colonial Governor, with instructions to enact it in the colony, especially on subjects in relation to which modern progress makes uniformity throughout the Empire desirable. Be this as it may, there is a difference in principle. The Belgian system is more logical and rigid, and under it the colony is developed on the lines of a well-managed estate. The British system is more haphazard but contains powers of growth.

The Belgians have had the examples of British and of French colonial administrations before them and have drawn from both sources so that their system stands half-way between the two. From France they have derived the idea of a council of experts to advise the Minister for the Colonies, but the Belgian council is differently constituted from the French and is consulted only on legislative proposals and on the budget of the Congo. The Secretary of State for the Colonies in London has the benefit of the reports of various committees but has no general council to advise him. The formation of a British Standing Colonial Committee specifically charged with the duty to report at stated intervals on the affairs of each colony has been advocated, but so far no action has been taken.

Both the French and the Belgians have a colonial inspectorate. The French inspectors come out from France and report direct to the Minister for the Colonies, while the Belgian inspectors are stationed in the colony and report to the Governor-General. Under both governments the inspectors are officers of high rank and inspect the work of all departments. The Belgian system relieves the Governor-General of the scrutiny of details and gives him more time to spend on vital issues. Britain has no regular inspection service, but it does, and that frequently, send out experts, with the concurrence of the colonies, to report upon existing practice and to suggest improvements.

In their native administration the Belgians have followed the lines of the British policy of indirect rule rather than the original French policy of assimilation. In their anxiety to avoid the errors of the Free State administration, and largely at the instigation of the Roman Catholic missionaries, they established an Aborigines' Protection Committee (*Commission pour la protection des indigènes*) which has no equivalent in British colonies, where its absence had not been felt.

Finally, a feature of Belgian administration is that the State is shareholder in some commercial undertakings. There has been continuous development through large companies to whom major concessions have been granted. The majority of the companies operating in the Congo are controlled by four financial groups, of which the largest is the Société Générale de Belgique, in which the Belgian Government has an interest amounting to about half the capital. The Government has made substantial contributions to the railways in the form of land grants and guarantees. The Katanga copper- and tin-mining industry is based on a concession made to the Compagnie du Katanga which created a development company, the Comité Spécial du Katanga. This company, in turn, conceded a prospecting monopoly to an English group, Tanganyika Concessions, formed by Sir Robert Williams. Eventually the sole right of exploiting the mineral resources of Katanga was assigned till 1990 to the Union Minière du Haut Katanga, representing jointly the Tanganyika Concessions, the Comité Spécial, and the Société Générale. In the Forminière, a Belgian-American organization, which exploits the alluvial diamond fields in the valley of the Kasai, the Government holds half the capital of the parent company and of the subsidiary companies, except one; the excepted company pays half its net profits to the State. Other important undertakings are Sabena, jointly established by the Governments of Belgium and the Belgian Congo and an aviation company, which, in peace-time, runs an air-mail

service from Europe to the Congo, and Otraco, formed by the State and the largest river shipping concern, to manage river ports and transport. Another power in the Belgian Congo is the Huileries du Congo Belge, a subsidiary of Lever Brothers and Unilever N.V., which received in 1911 a concession to lease a maximum of 1,852,500 acres, with possible eventual ownership, and to erect oil mills.

Executive

(Figs. 42–44)

Belgian Congo

Colonial Government. The head of the administration, under King and Parliament, is the Minister for the Colonies, whose functions are similar to those of the British Secretary of State. He is assisted by an Administrator-General (*administrateur général des colonies*), whose task is to ensure continuity of administration, and who corresponds to our Permanent Under-Secretary. The Administrator-General has a Legal Adviser (*conseiller juridique*) and the Colonial Office is divided into the following sections:

(1) Policy, administration, and law.
(2) Native affairs, religion, and education.
(3) Finance, taxes, and customs.
(4) Trade, public works, and communications.
(5) Agriculture and stock.
(6) Personnel and stores.

At the head of each section is a Director-General. The Administrator-General has also financial and medical advisers and an office concerned with colonial propaganda and public information on financial matters. The senior Colonial Office officials form an advisory council (*conseil d'administration*) to the minister.

In the colony the king is represented by the Governor-General, who has the widest executive powers and can take any action which does not clash with the provisions of an Act of Parliament (*loi*) or Order in Council (*décret* or *arrêté royal*). He is in charge of all the colonial services, administrative and military, and he frames the budget, provides for collection of revenue, and authorizes expenditure (in accordance with the budget).

Directly under the Governor-General come the Vice-Governor-General, the Inspectorate (p. 222), the Secretary-General (*secrétaire général*), who is also the Secretary for Native Affairs and deals with

Labour, the Commander of the Army (*force publique*), and the heads of departments. The Customs Department works in conjunction with an office in Antwerp where duty on shipments to the Congo may be assessed.

The Governor-General has an advisory council (*conseil de Gouvernement*) composed of the Vice-Governor-General, Inspectors, Attorney-General (*procureur-général*), Secretary-General, Provincial Commissioners, heads of departments, and officials and non-officials nominated by the Governor-General.

As already mentioned, the Colonial Charter has set up an Aborigines' Protection Committee. This committee, which is entirely independent of the Governor-General, consists of experienced residents nominated by the king, meeting under the presidency of the Attorney-General. A sub-committee meets in the province of Elisabethville (Katanga). The committee must be convened at least once a year. Its recommendations and criticisms are submitted to the king and published, though somewhat irregularly.

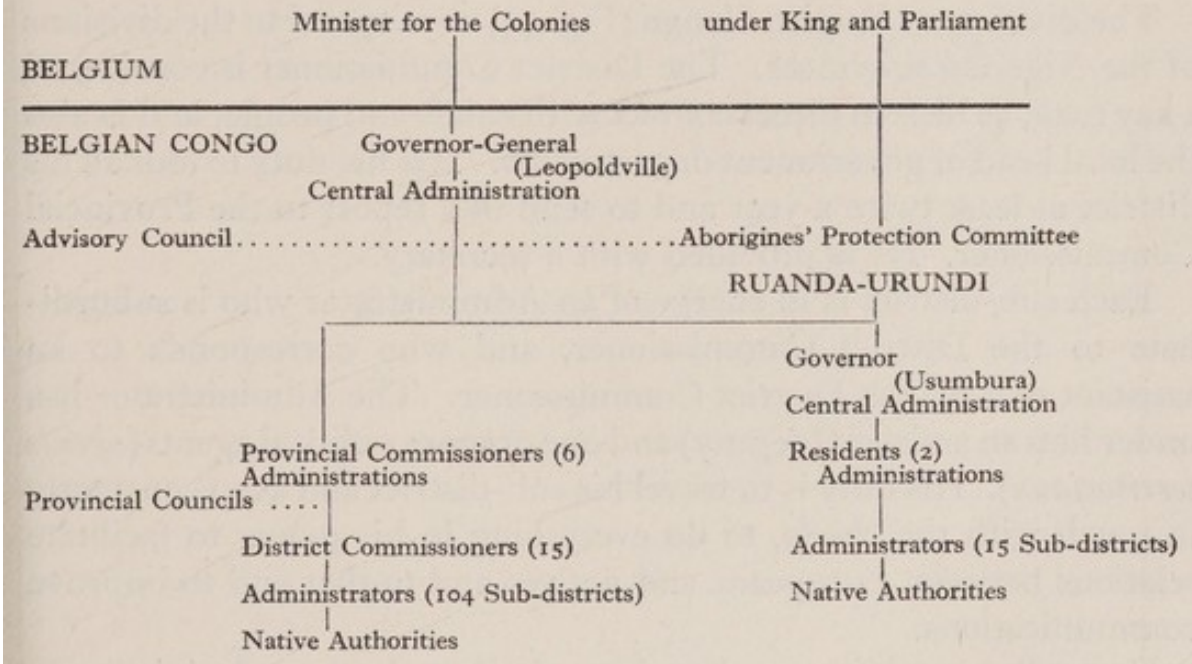


FIG. 42. *Administration*

Fig. 42 is a diagram of the administration and the Appendix gives the administrative divisions. The colony is divided into six provinces—Leopoldville, Coquilhatville, Stanleyville, Costermansville, Elisabethville, and Lusambo, each taking its name from its capital. The 6 provinces are divided into 15 districts (excluding the urban district of Leopoldville), and the 15 districts are subdivided

into 104 sub-districts (*territoires*). A province is administered by a Provincial Commissioner with an administrative staff consisting of a Senior District Commissioner (*commissaire de district principal*) and District Commissioners, who may either be employed at the provincial headquarters or posted to districts. Each province contains its own Secretariat, Finance, Customs, Trade (*affaires économiques*), Medical, Public Works, Lands, Agriculture, and Forestry staffs.

The Provincial Commissioner has an advisory council (corresponding to the Governor-General's Council) consisting of provincial heads of departments, District Commissioners, the procureur-général of the province (Crown Counsel), and other officials and also non-officials of Belgian nationality nominated by the Provincial Commissioner. The council meets once a year and discusses the provincial estimates. The Provincial Commissioner may consult it on any matter of public interest and must consult it on public works and certain other subjects. The minutes go before the Governor-General in Council.

The districts of Belgian Congo (Fig. 43) correspond to the divisions of the Nigerian provinces. The District Commissioner is considered a key man, as he is in direct contact with chiefs and people, and is also the local head of government departments. It is his duty to tour all his district at least twice a year and to send in a report to the Provincial Commissioner. He is provided with a secretary.

Each sub-district is in charge of an Administrator who is subordinate to the District Commissioner, and who corresponds to an assistant to a British District Commissioner. The Administrator has under him an assistant (deputy) and one or more political agents (*agents territoriaux*). His duty is to travel his sub-district and keep constantly in touch with the chiefs, to do everything in his power to facilitate relations between Europeans and natives and to that end to improve communications.

Generally speaking, as has been indicated, the administrative heads of provinces, districts, and sub-districts supervise the work of all the departments within their areas, but exceptions are made in the case of the Army, and the Medical, Marine, Telegraphs and Telephones, Agriculture and Forestry, and Audit Departments, which are administered by their own heads.

A start has been made to introduce municipal government by creating the town of Leopoldville an 'urban district' (*district urbain*) under the administration of a special District Commissioner (*com-*

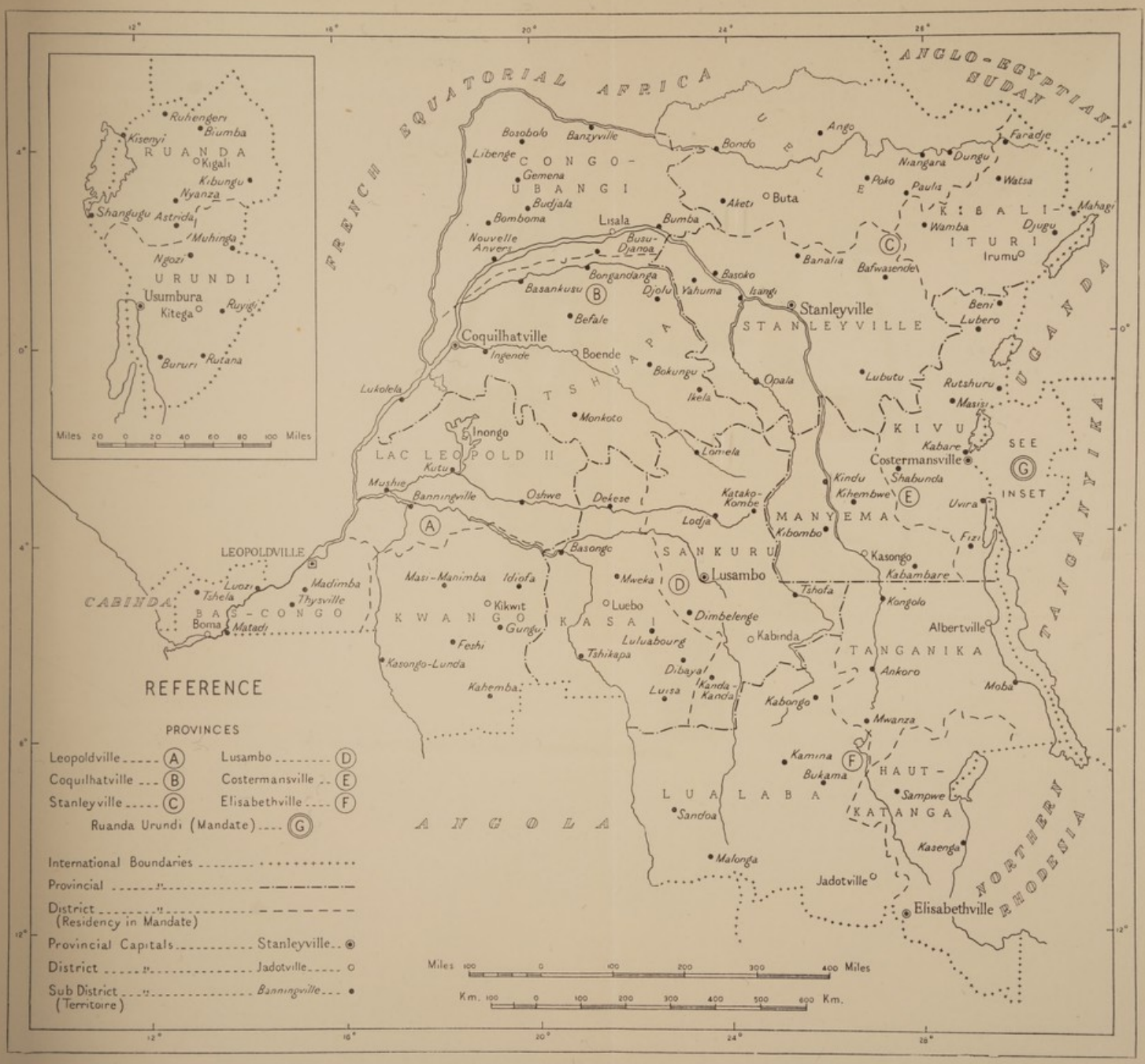


FIG. 43. *Administrative Divisions*

missaire de district urbain) and a Municipal Council (*comité urbain*) consisting of from three to eight members, of Belgian nationality, nominated for a term of two years by the Provincial Commissioner. The urban district is constituted a corporation, with powers to hold property and to sue in its corporate name. The functions of the Commissioner of the urban district are similar to those of an ordinary District Commissioner. The council approves the estimates for the urban district before these are sent on to the Provincial Commissioner, and it has powers to impose local taxes, subject to ratification by the Provincial Commissioner. With the approval of the Governor-General, it can also borrow money for public works.

Native Administration. The natives of Belgian Congo may be classified, according to their place of residence, into three groups: (1) tribal communities; (2) inhabitants of towns, and (3) those permanently resident on government or mission or private lands. Members of the last group are under the direct control of their masters; as regards the others, the Belgians have followed the British policy of indirect rule, that is, the administration of natives through their own chiefs. To carry this out they have divided the colony into chiefdoms (*chefferies*) and sectors (*secteurs*). The chiefdom is an area under a hereditary chief who is confirmed in office by the Government and exercises a certain jurisdiction. A sector consists of various small groups united for convenience under a chief and council selected by the Government. Both chiefdom and sector have corporate status, a treasury and a budget, and can, under supervision, levy taxes and borrow money. The two classes of chiefs collect taxes, recruit for the army, enforce sanitation, and generally assist the Government. Chiefdoms and sectors collectively are termed *circonscriptions indigènes.*

The native quarters of large towns contain increasingly mixed populations drawn from different tribes. Many of these have been constituted detribalized native zones (*centres indigènes extra-coutumiers*) by the Governor-General, or by the Provincial Commissioners under delegated powers. They are corporate bodies, with their own treasuries and accounts, and power to impose certain taxes, subject to the approval of the Provincial Commissioner. The centres are under the supervision of the Governor-General or his representative. Each has its own chief and council nominated by the District Commissioner. The duties of the chief of a centre are similar to those of the other classes of chiefs. To ensure the proper working of these

centres each province has a committee (*comité protecteur*) composed of the Commissaire de district principal or the District Commissioner as president and six other members, of whom three must be non-officials.

A decree lays on native administrations in the Congo and Ruanda-Urundi the obligation to maintain sufficient subsistence crops and also to grow certain plants, such as cotton, the cultivation of which is considered to have a civilizing effect. The rules lay down for each district a prescribed number of acres. The cotton companies have a monopoly and buy the cotton at a fixed price: a portion of the price is paid into the native treasuries for road repairs and the like. There is a risk of exploiting the native by fixing a price below the market value and by serving private interests, but it is thought that some success has been achieved and that, even if compulsion were withdrawn, a considerable quantity of cotton would now continue to be cultivated.

Natives who intend to be absent from their customary places of residence for a continuous period of over thirty days must obtain passports.

Ruanda-Urundi

As already mentioned, Ruanda-Urundi is administered as a part of Belgian Congo. It is treated as a province, but the officer in charge has the title of Vice-Governor, or Governor for short, and has no advisory council. The central administration consists of a Secretariat and of the Departments of Justice, Finance and Public Health, Public Works, Trade, Agriculture and Forestry, Lands, and Posts and Telegraphs.

The headquarters are at Usumbura and, instead of being divided into districts, the mandated area is divided into two residencies (*résidences*), corresponding to the sultanates of Ruanda and of Urundi. The two residencies, in their turn, are divided into 8 and 7 sub-districts (*territoires*) respectively. Each Resident advises the Sultan (*mwami*) and supervises the administration. Officers in charge of sub-districts have the same title as in the colony, viz. Administrators. Natives, except those who have settled in *centres extra-coutumiers*, are subject, as presently described, to the mwami of the residency (plural *wami*).

In order to carry out the intentions of the mandate, Ruanda-Urundi has been given by Parliament a legal personality and its accounts are kept separate from those of the colony. The king is authorized to raise

separate loans, by Treasury Bonds, for Ruanda-Urundi up to a certain limit.

The legislation of the Belgian Congo dealing with native administration has not been applied. The whole of the territory is under two *wami*, and these govern it through *watwali* (singular, *mtwali*) who form an aristocracy and may be of the mwami's blood. Custom, of course, yields to a law of the mandatory power. No native administrations have been set up in the native quarters of towns as has been done in the colony.

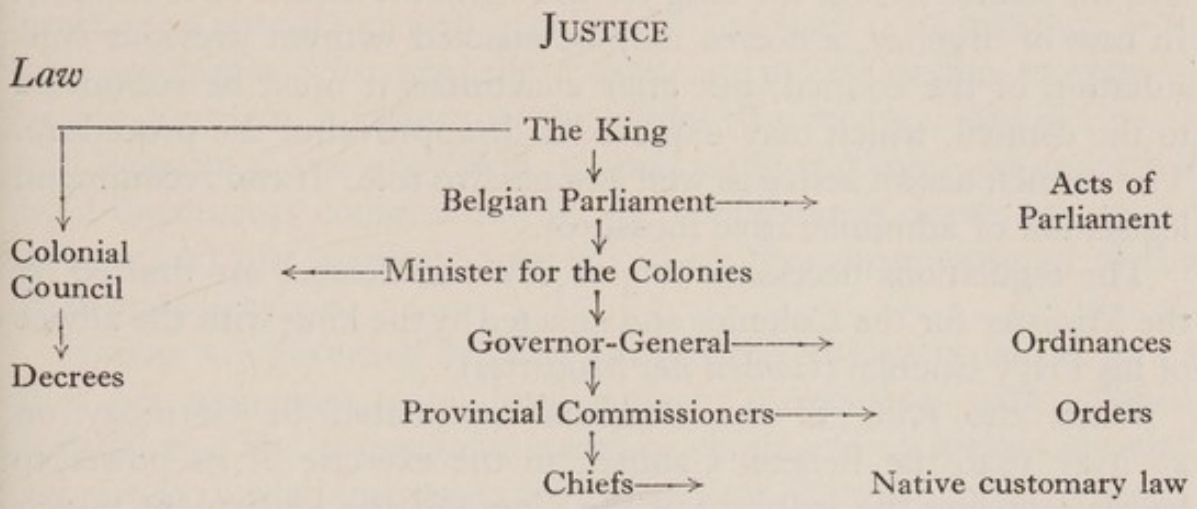


FIG. 44. *The Legislative System of the Belgian Congo*

Belgian Congo. Both Europeans and natives are subject to the general laws of the colony, so far as each of these classes comes within their scope. These laws emanate mainly from Brussels, but partly from Leopoldville and the provincial and district headquarters. The foundation law is the Colonial Charter (p. 220), which contains a short Constitution. The Constitution delegates most of the legislative power to the Crown, saving the rights of Parliament. Much of the law has been codified: the Civil Code contains the common law of the colony.

Parliament, as has been seen, granted the 'charter', and invariably passes the annual budget of the colony (which means that it is often not passed till half the financial year has elapsed). It has, as well, reserved a few other subjects, and Acts of Parliament override all other laws. But it is obviously impossible for Parliament to legislate fully for the colony. A leaf is taken from British practice by laying documents relating to concessions before the Chambers for their tacit approval, but in practice all legislation which, for the mother country, would be passed in Parliament, is enacted for the colony by

royal decree. This is as if the British Crown Colonies were governed by Orders in Council.

The Governor-General is consulted on all proposed decrees. When a decree has been drafted in the Belgian Colonial Office it is submitted to a Colonial Council consisting of 14 members: 8 are nominated by the king, 3 elected by the Senate, and 3 by the *Chambre*. In a published report the council states the objections, if any, of its members. The Minister for the Colonies can override these, but in practice never does. If the report is favourable, the Colonial Minister lays the decree before the king for his signature and it becomes law. In case of urgency, a decree may be enacted without previous consultation of the council, but after enactment it must be submitted to the council, which may express its disapproval of the procedure. The council has an active as well as a passive role. It can recommend legislation or administrative measures.

The regulations necessary to give effect to decrees are drafted by the Minister for the Colonies and enacted by the king with the advice of his Privy Council (*Conseil des Ministres*).

When the King of the Belgians capitulated to Germany on 28 May 1940 the Belgian Cabinet, in the exercise of its power to legislate during the inability of the king and the Parliament to act, promulgated a decree which vested in the Minister of the Colonies and, failing him, the Governor-General full legislative and executive powers for the colony. The Minister was given the title of Administrator-General of the Belgian Congo and Ruanda-Urundi. He proceeded to London, where he was later joined by three other Ministers, and these four Ministers became responsible for the general policy of the Congo.

The Governor-General of the colony has nominally no power to legislate. Only in urgent cases is he permitted to enact an ordinance which, however, expires after six months unless confirmed by a decree. He has power to make regulations on matters of administration or order and to attach a maximum penalty of two months' imprisonment and fine of 2,000 francs. Since the fall of the franc the maximum fines have been multiplied by ten, except in the case of natives (decree of 17 January 1927).

Provincial Commissioners have power to make regulations (not inconsistent with the ordinances of the Governor-General) on matters of administration and order within their provinces and to attach thereto penalties not exceeding one month's imprisonment and a fine of 1,000 francs.

The offices of registration of births, deaths, and marriages are known as the Offices of the Civil Status (*Bureaux d'état civil*). This registration applies to all Europeans and to natives who are 'matriculated'. *Immatriculation* is a procedure by which any native can register himself at the office of civil status and become entitled to all civil rights and exemption from native law. It must not be confused with the French 'immatriculation' of real estate (p. 237).

In order to satisfy the requirements of Belgian law, officials have been appointed in each of the provinces to discharge the duties of notaries. In England notaries are not a separate class; some solicitors practise as notaries as well as solicitors and their principal duty is to note and 'protest' foreign bills of exchange in case of non-acceptance or non-payment, in order that the holder may recover. But in France and Belgium the notary's field is much wider and contracts and other legal documents come within it: the document is drawn up by the notary, and his certificate is accepted by the courts as proof of the facts stated therein.

Natives are governed by their local native customary law so far as it is not repugnant to civilized ideas or inconsistent with colonial legislation. The native inhabitants of chiefdoms or sectors are also subject to regulations passed by their chiefs, with the concurrence of the councils of elders and the approval of the Government. The chiefs have power to impose penalties of seven days' imprisonment and a fine of 100 francs for breach of these regulations.

Ruanda-Urundi. Acts of the Belgian Parliament which apply to Ruanda-Urundi come into immediate force. Similarly, royal decrees and ordinances of the Governor-General which are specially enacted for the mandated area apply as soon as promulgated. The conditions, however, in Ruanda-Urundi are not identical with those of Belgian Congo, and so the Belgian Parliament has decided that decrees and legislative ordinances enacted for the Congo shall not apply to Ruanda-Urundi until made applicable by an ordinance of the Governor of the mandated territory. The same proviso applies to regulations in matters of administration and public order.

Like the Governor-General, the Governor of Ruanda-Urundi can legislate provisionally on urgent matters and his enactments are styled Ordinances.

Courts (Fig. 45)

Belgian Congo. As in British African colonies, there is a series of colonial courts, presided over by Europeans, with jurisdiction, each

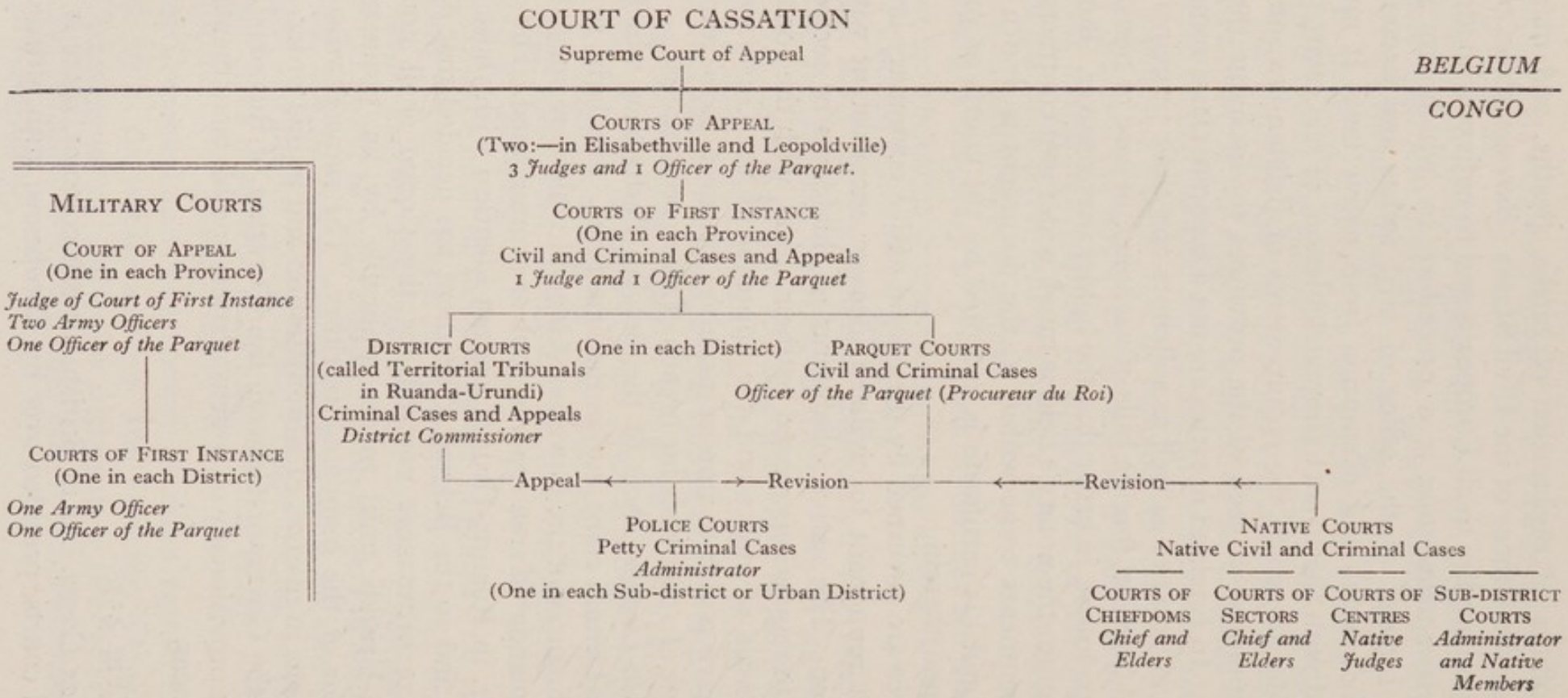


FIG. 45. *The Judiciary*

in its degree, over the inhabitants, and likewise there are native courts, for natives only. The Registrar of a court is known as *le greffier* and his office as *le greffe*. He is an important official and considered as a member rather than an officer of the court. A peculiarity of the Belgian system is that the powers of the colonial courts, or some of them, are enhanced when a member of the *procureur-général*'s department is present to conduct the proceedings on behalf of the Government. This department is known as the *ministère public* or the *parquet*, and corresponds to the attorney-general's department in a British colony, but its functions are wider. The law of England is built up on case law: the law of Belgium and of France and other parts of Europe rests equally upon the opinions of Doctors of Law, and the State, by its corps of trained lawyers, intervenes to a considerable extent in the courts. Shakespeare's Portia was not an officer of the parquet, but she acted like one. Officers of the parquet prosecute in criminal courts and investigate complaints against magistrates, but they have another role. There is an office of the parquet in each district, and at each district headquarters an officer of the parquet presides over a court (*tribunal du parquet*) which is the regular court of first instance in civil suits involving non-natives. Moreover, when a crime is committed in an area more than 25 kilometres from the nearest ordinary criminal court, an officer of the parquet may take prompt action by himself holding a special court.

The European courts start, at the bottom of the ladder, with the police court (*tribunal de police*). There is one of these in each subdistrict or urban district. The local administrator is the judge, and he deals only with criminal cases against natives, on whom he can pass sentences up to two months' imprisonment and a fine of 2,000 francs. He may sit with or without native assessors. His decisions are revised by the parquet. When an officer of the parquet attends, the court has jurisdiction over non-natives up to a fine of 2,000 francs and its jurisdiction over natives is increased to two years' imprisonment. The remedy then is by way of appeal to the district court.

The judge of the district court is the district commissioner, who has jurisdiction over natives up to six months' imprisonment and a fine of 2,000 francs and may sit with or without assessors. When an officer of the parquet is present, the court has full jurisdiction over natives and jurisdiction over non-natives up to five years' imprisonment and fine. An appeal lies to the court of first instance, of which there is one in each province. The presiding officer is a Judge, and an officer of the parquet appears on behalf of the Government. The

court has full civil jurisdiction and full criminal jurisdiction over non-natives. It also hears appeals from parquet courts.

The highest court in the colony is the court of appeal, consisting of three Judges with an officer of the parquet in attendance to represent the State. There are two of these courts—one at Leopoldville for the provinces of Leopoldville, Coquilhatville, Stanleyville, and Lusambo, and another at Elisabethville for the provinces of Elisabethville and Costermansville. These courts hear criminal appeals from the courts of first instance and civil appeals from courts of first instance and parquet courts.

The *tribunal du parquet* consists of a *procureur du roi* or his deputy, sitting with or without assessors (in native cases). The powers of the court extend to a year's imprisonment and fine of 2,000 francs, and its civil jurisdiction includes suits of the value of 5,000 francs.

Certain police officers (*officiers de police judiciaire*) have powers to fine offenders. The fine is reported to the parquet and to the office which collects fines, and, unless the parquet considers prosecution necessary, payment of the fine puts an end to the case.

From the colony an appeal in civil cases lies to the court of cassation in Belgium.

Besides the ordinary colonial courts there are also military courts of two grades—*conseils de guerre*, consisting of an army officer, assisted by an officer of the parquet, with jurisdiction in offences committed by officers, non-commissioned officers, and men of the armed forces, and *conseils de guerre d'appel*, composed of the judge of the court of first instance, together with two army officers, assisted by an officer of the parquet, with jurisdiction to hear appeals from the military courts. As these courts are permanently established at certain centres they have been described in this paragraph as 'military courts', to distinguish them from a British court-martial which is convened *ad hoc*. Naturally, however, it is provided that the rank of a military member of the court shall not be less than that of the accused, and so the composition of the court may vary.

The native courts consist of courts of chiefdoms, sectors, centres, and sub-districts. These courts have civil and criminal jurisdiction over natives and their decisions can be quashed by the parquet.

Courts of chiefdoms (*tribunaux de chefferie*) consist of the customary chief and of members nominated by the district commissioner. Tribunaux de chefferie are either principal or secondary. The former can transfer cases to or from the latter.

Tribunals of sectors (*tribunaux de secteur*) consist of chiefs and

elders nominated by the district commissioner, while tribunals of centres (*tribunaux de centre*) are composed of from one to three native judges nominated by the district commissioner. Tribunals of sub-districts (*tribunaux de territoire*) consist of the administrator and two or more native members nominated by the administrator.

In all native courts the administrator, within his sub-district, and the district commissioner, within his district, can preside and in that case has the final voice in the decision. The criminal jurisdiction of native courts extends to a sentence of one month's imprisonment and a fine of 1,000 francs, but when a political officer presides, the fine may be increased to 2,000 francs and the imprisonment to two months.

Ruanda-Urundi. As the mandate allows Belgium to administer this territory as part of the Congo, the judicial system is similar, but there are a few differences. The district courts are replaced by two *tribunaux territoriaux*—one for Ruanda and one for Urundi. These courts have full criminal jurisdiction over natives and also a civil jurisdiction over non-natives which is little used: during the period 1935–1938 there was one civil case. Parquet courts have been found unnecessary, but two offices of the parquet exist. There is a military court and a military court of appeal. As regards native courts, these are of two grades—*tribunaux de chefferie* and *tribunaux régionaux*. Supervision of their work lies with the local administrative official, who may attend any court and advise the judge, may review any sentence on appeal or on his own initiative, and is required to quash any sentence which is contrary to public morals.

Miscellaneous

Education

Belgian Congo. Schools have been established by the State, the missionaries, and the large industrial enterprises. The mission schools are by far the most numerous: the majority are Roman Catholic. In 1941 there were 6 State schools for natives and 3 for European children. In addition, there were 5,252 subsidized mission schools for natives and 21 for European children. There are also unsubsidized schools. No subsidy is given to a body which is not recognized as national, which means that two-thirds of the administering body must be Belgian. This is the result of an agreement made with the Roman Catholic missions in 1926 and challenged by British and other Protestant missions as being contrary to the equality clause

of the Convention of St. Germain. The agreement will be due for revision in 1946. The Christian Brothers, Marist Brothers, and some of the Salesian Fathers are trained teachers, and notable work has also been done by the English Baptist Missionary Society. The Union Minière and the Compagnie Réunie des Huileries du Congo Belge et Savonneries Lever Frères have opened schools or technical schools; and other companies have done the same.

Ruanda-Urundi. On 1 January 1941 there were 2 State schools, 2,637 Roman Catholic Mission schools, and 964 Protestant Mission schools, besides some Moslem schools—there were 27 of these in 1938—and 1 or possibly 2 Indian schools. The best-known Roman Catholic missions are those of the White Fathers and the White Sisters. The Protestant schools are managed by the Société Belge des Missions Protestantes, Church Missionary Society, Mission Baptiste Danoise, Friends' Africa Gospel Mission, Mission Libre Suédoise, and Seventh Day Adventists.

Schools for Sons of Chiefs. The Government is alive to the importance of educating the future chiefs. A school for the sons of chiefs has been established at Buta, in the Congo, under the management of priests of the Premonstratensian Order. Another has been set up by the Government at Astrida, in Ruanda. Chiefs are encouraged to send their sons or nephews. The pupils receive instruction in a native language, with special bearing on the duties of chiefs and their relations to the Government, the rights of the people, and elementary instruction in agriculture and other technical subjects.

Land

The Congo Free State claimed vacant lands as the property of the State. Subsequently, all areas not under actual cultivation were classed as vacant and the Government claimed a monopoly in the forest produce. Enormous concessions were granted. The concession to the Katanga company (estimated at over 111,000,000 acres) was eventually placed under the administration of a joint body, the Comité Spécial du Katanga, two-thirds of whose members represent the Government and one-third the company. A similar reconstruction was effected in the Kivu region, where the Comité National du Kivu is charged with the development or colonization of an area of nearly 20,000,000 acres. After the annexation of the Congo by Belgium, concessions were granted giving the grantee the right to choose blocks of land within an area. An example of this was the concession to Huilever.

A decree ordered the demarcation of native lands, but this has not generally been done. Sales of land by natives are, however, carefully supervised by a commission consisting of a judge, a missionary, and another European.

In Ruanda-Urundi the Belgian Government at first permitted only leases of native lands to non-natives, and now the Congo decree regulating the inquiry to be made before land is alienated is in force.

The law attaches legal validity only to titles which have been secured by *enregistrement*: native land rights not so secured remain subject to native law and custom. Registration is compulsory for all lands alienated by the State, or acquired by non-natives from natives. The applicant files an application with the Conservator of Property (*conservateur des titres fonciers*), giving the situation, area, boundaries, tenants, and adjoining proprietors of the parcel of ground, the erections built on it, and the nature of the occupation—commercial, agricultural, or otherwise. The title-deeds (if any) are submitted and any encumbrances on the land are stated. The land is officially surveyed, and a certificate of registration containing as complete a description as possible of the property and indicating all the charges, servitudes, and obligations with which it is burdened is delivered to the proprietor. A duplicate is inscribed in a volume kept by the Conservator: this inscription constitutes the official registration. Upon a sale, the conveyance must be executed before the Conservator, who endorses on the certificate a note of the sale or, in case of alteration of boundaries, issues a fresh certificate. Registration (*enregistrement*) must be distinguished from the French system of *immatriculation*. Immatriculation is a method, inspired by the Torrens system, whereby an indefeasible title is obtained, certified by the State against third-party claims, and granted only after full notice to other claimants. Enregistrement does not give the same guarantee, though in certain circumstances the State would appear to become responsible for a defect in the registration of encumbrances.

Labour

Neither in the Congo nor in Ruanda-Urundi is there any law which authorizes the use of forced labour for public works, but a decree empowers administrative officers to requisition carriers and paddlers on payment, for limited periods. Local officers are also authorized to levy compulsory labour to combat infectious diseases or in other emergencies. Natives may be compelled to cultivate foodstuffs or

some marketable crop, such as cotton, but only for the benefit of the native community (p. 228). They are also liable within their tribal areas for the construction and maintenance of local roads and the building of dispensaries, schools, and prisons. For these purposes every able-bodied male may be required to give up to 60 days' labour in each year. The work is not paid from funds provided by the central government, but may be paid from the local native treasury if funds are available. Roads for which the central government is responsible are constructed or maintained by tax-defaulter labour or paid labour.

In 1937 head porterage was diminishing in Leopoldville and Stanleyville provinces and in Urundi, and increasing in Ruanda and in the provinces of Coquilhatville and Costermansville and possibly of Lusambo. The decrease was due to the extension of roads and motor transport and the establishment of new and more convenient markets, while the increase was caused by increased production of foodstuffs and mining development, and the increase of the white population.

In Ruanda-Urundi the final aim is to obtain the total suppression of customary taxes in labour exacted by the chiefs. These exactions, however, are so bound up with the prestige of the chiefs that the Government has to proceed cautiously by stages. So far, redemption of labour-tax is permitted to natives in the service of Government or of enterprises of a European character, to Watusi stock farmers, catechists, and to seasonal labourers on their return from neighbouring territories.

As regards the recruitment of labour for mining and industrial purposes, the Belgian Congo Government has swung completely away from the policy of the Congo Free State. The Colonial Charter drawn up at the time of the taking over of the territory from the Congo Free State specifically decrees that 'no one can be forced to work for private individuals or for companies'. In 1925 a Labour Commission recommended 25 per cent. of able-bodied male labour as the maximum which could fairly be taken from any community, only 5 per cent. of this to be taken for work at a distance. In 1928 a permanent advisory committee on labour questions was appointed. It advised that the problem should be dealt with regionally. In 1930 another Labour Commission was appointed to study the question on the spot, in collaboration with the Aborigines' Protection Committee (p. 225). It pronounced against official intervention on behalf of recruiters. The position is complicated by the fact that the State has a direct interest in most of the industrial enterprises.

Only a small proportion of the population are wage-earners. In 1937, out of a population of 10,000,000 containing 2½ million able-bodied men, it was estimated that less than 500,000 were so employed in the Belgian Congo, while in Ruanda-Urundi, out of a population of about 3½ millions including 800,000 able-bodied men, less than 20,000 worked as labourers. The majority of these were attracted by the high wages paid in the mines. For the same reason the natives of Ruanda-Urundi seek employment in Uganda, where wages are higher than in their own territories. The companies do all they can to stabilize their labour by providing good conditions and encouraging family settlement. The Government control recruiting by forbidding it from time to time in districts which, on account of sickness or for other causes, cannot spare the population, and by establishing camps where labourers can become 'acclimatized' to the food and conditions before commencing work. Bonuses due to chiefs for recruiting labourers are paid into the treasuries of the native administrations.

The Armed Forces and the Police

Belgian Congo. The colony in peace-time possessed a force of native troops (*force publique*) amounting to about 160 European officers, 170 European non-commissioned officers, and 13,000 natives, including recruits. The force is recruited by conscription and voluntary enlistment. The contingent to be recruited is fixed annually by decree. During the period from 1931 to 1937 the annual contingent was fixed at from 2,100 to 4,800. The period of service is seven years, with five years in the reserve. The officers and European non-commissioned officers are seconded from the Belgian army. The natives are recruited from a variety of tribes, especially the Batetela, Bangala, and other upper-river tribes.

Since early in the century town police forces have existed, but in 1927 the *police urbaine* was definitely organized at Elisabethville and Leopoldville and later at Matadi, Stanleyville, Jadotville, and Coquilhatville: the list of places can be extended by the Governor-General. The police are commanded by European commissioners and assistant commissioners, subordinate to the commissioners of the districts or administrators of the territories in which they are stationed. Less important centres have their own police drawn from the ranks of the *force publique*. At the headquarters of a sub-district and in minor settlements the administrator can draw upon a detachment of the *force publique*. Finally, in chiefdoms the chief exercises police powers.

Ruanda-Urundi. By the terms of the mandate natives of Ruanda-Urundi cannot be recruited for the armed forces except for local police requirements and local defence. In practice the territory is garrisoned by troops from the colony.

The native police comprised, on 31 December 1938, for the whole of the mandated area, 12 non-commissioned officers and 146 constables. They were allocated as follows:

Usumbura: 6 non-commissioned officers and 50 men.
Kitega: 6 non-commissioned officers and 44 men.
Nyanza and Rumonge: 11 men.
Kigali: 41 men.

The Usumbura contingent, commanded by a European commissioner of police, included some old soldiers from the Belgian Congo. The other constables were natives of the mandated area. The Kigali contingent was composed exclusively of Watusi.

Transport

The history of the construction of the railways is dealt with in the chapter on Communications.

The railways have been constructed and are maintained with the active participation of the Government, which has assisted in various ways, by providing capital, or by carrying out the construction and retaining an interest in finance and management, or by forming a company in which the State holds the majority of the shares, or by guaranteeing interest.

Originally the railways were feeders to the river transport, but now the position is reversed. The first steamer of the Marine du Haut-Congo was introduced in 1881. This department was superseded by a company in 1919, merged in 1925 in the Union Nationale des Transports Fluviaux (Unatra), and finally absorbed by the Office d'Exploitation des Transports Coloniaux (Otraco).

There has recently been a considerable development of motor-roads in order to feed the rail and river system. In 1937 3,160 miles of main roads had been constructed and 38,780 miles of other roads.

The Belgians were pioneers of aviation in Africa. By 1920 an air service between Leopoldville and Stanleyville was established by the Belgian Société Nationale pour l'Étude des Transports Aériens (Sneta), and in 1923 the Sneta, in conjunction with the Belgian Government and the administration of Belgian Congo, formed a limited company, the Société Anonyme Belge d'Exploitation de la Navigation

Aérienne (Sabena), which in normal times runs a mail service between Europe and the Congo: the chief centres in the country are also united by air.

Mining

The Congo Free State claimed all mineral rights and gave large mineral concessions to companies such as the Comité Special du Katanga and the Compagnie des Chemins de Fer du Congo Supérieur aux Grands Lacs Africains. These were continued by the Belgian Government, which has itself granted mineral rights in a large area to the Comité National du Kivu. Ruanda-Urundi has applied the Congo law, which reserves mineral rights to the State. In 1891 an exclusive right to minerals in Katanga (mainly copper) was given to the Compagnie du Katanga which in 1900 created a development company, the Comité Spécial du Katanga. This company, in turn, conceded a prospecting monopoly to a British group, Tanganyika Concessions, formed by Sir Robert Williams. Eventually, the sole right of exploiting the mineral resources of Katanga was assigned to the Union Minière du Haut Katanga, representing jointly the Tanganyika Concessions, the Comité Spécial du Katanga, and the Société Générale de Belgique, in the last of which the Government holds shares.

A special organization, the Régie Industrielle des Mines de Kilo-Moto, was created to develop the Kilo-Moto gold-mines, and in 1926 the Régie was converted into the Société des Mines d'Or de Kilo-Moto, and all the ordinary and two-thirds of the preference shares were allotted to the State.

The diamond fields that extend from the basin of the Kasai river over into Angola are worked by subsidiary companies of the Société Internationale Forestière et Minière du Congo (Forminière) in which the Government holds half the capital.

Practically all exploitation has been in the hands of large concessionnaire organizations. In Katanga special authorization is necessary for prospecting on land in native occupation, and native mining workings in the Belgian Congo and in Ruanda-Urundi are protected. The Compagnie des Chemins de Fer du Congo Supérieur aux Grands Lacs Africains threw open to public prospecting 200 kilometres on the right bank of the Congo. For prospecting in Katanga a general prospecting licence (*permis général de recherche*) is required. The holder of such a licence who discovers minerals can acquire an exclusive prospecting licence (*permis spécial et exclusif de recherche*). To win the minerals a mining right (*permis d'exploitation*) is required.

Segregation

The chief European centres have been constituted European townships (*circonscriptions urbaines*). In these natives are segregated from Europeans and only a few servants are allowed to reside on the premises of their employers. All other natives must reside in native quarters, which are laid out in plots leased to natives for the erection of houses of an approved pattern. The policy of the administration is to develop a permanent population in the industrial areas. The Forminière and the Huilever have induced villages to migrate to their concessions where they live in accordance with native custom. The Union Minière has laid out carefully planned lines of huts for its employees.

APPENDIX

ADMINISTRATIVE DIVISIONS

BELGIAN CONGO

Province of Leopoldville

Headquarters: Leopoldville

Districts	*Headquarters*	*Sub-districts*	*Headquarters*
Leopoldville Urban district	Leopoldville	..	..
Bas-Congo	Boma	Bas-Fleuve	Boma
		Matadi	Matadi
		Mayumbe	Tshela
		Manianga	Luozi
		Cataractes	Thysville
		Inkisi	Madimba
Kwango	Kikwit	Moyen-Kwilu	Kikwit
		Idiofa	Idiofa
		Bapende	Gungu
		Lukula	Masi-Manimba
		Kahemba	Kahemba
		Feshi	Feshi
		Bayaka	Kasongo-Lunda
Lac Leopold II	Inongo	Inongo	Inongo
		Mushie	Mushie
		Oshwe	Oshwe
		Kutu	Kutu
		Banningville	Banningville

Province of Coquilhatville

Headquarters: Coquilhatville

Districts	*Headquarters*	*Sub-districts*	*Headquarters*
Congo-Ubangi	Lisala	Bomboma	Bomboma
		Budjala	Budjala
		Lisala	Lisala
		Bumba	Bumba
		Busu-Djanoa	Busu-Djanoa
		Libenge	Libenge
		Bosobolo	Bosobolo
		Banzyville	Banzyville
		Gemena	Gemena
		Nouvelle Anvers	Nouvelle Anvers
Tshuapa	Boende	Basankusu	Basankusu
		Lukolela	Lukolela
		Bongandanga	Bongandanga
		Djolu	Djolu
		Befale	Befale
		Coquilhatville	Coquilhatville
		Ingende	Ingende
		Monkoto	Monkoto
		Bokungu	Bokungu
		Boende	Boende
		Ikela	Ikela

Province of Lusambo

Headquarters: Lusambo

Sankuru	Kabinda	Lusambo	Lusambo
		Dimbelenge	Dimbelenge
		Kabinda	Kabinda
		Tshofa	Tshofa
		Lodja	Lodja
		Katako-Kombe	Katako-Kombe
		Lomela	Lomela
		Kanda-Kanda	Kanda-Kanda
Kasai	Luebo	Luebo	Luebo
		Luluabourg	Luluabourg
		Dibaya	Dibaya
		Luisa	Luisa
		Tshikapa	Tshikapa
		Basongo	Basongo
		Bakuba	Mweka
		Dekese	Dekese

Province of Stanleyville

Headquarters: Stanleyville

Stanleyville	Stanleyville	Basoko	Basoko
		Banalia	Banalia
		Bafwasende	Bafwasende
		Opala	Opala

Districts	*Headquarters*	*Sub-districts*	*Headquarters*
Stanleyville	Stanleyville	Yahuma	Yahuma
		Isangi	Isangi
		Stanleyville	Stanleyville
		Lubutu	Lubutu
Uele	Buta	Bondo	Bondo
		Ango	Ango
		Dungu	Dungu
		Mangbetu	Paulis
		Buta	Buta
		Aketi	Aketi
		Poko	Poko
		Niangara	Niangara
Kibali-Ituri	Irumu	Faradje	Faradje
		Mahagi	Mahagi
		Djugu	Djugu
		Irumu	Irumu
		Watsa	Watsa
		Wamba	Wamba

PROVINCE OF COSTERMANSVILLE

Headquarters: Costermansville

Kivu	Costermansville	Masisi	Masisi
		Rutshuru	Rutshuru
		Kabare	Kabare
		Uvira	Uvira
		Fizi	Fizi
		Shabunda	Shabunda
		Lubero	Lubero
		Beni	Beni
Manyema	Kasongo	Kindu	Kindu
		Kabambare	Kabambare
		Kasongo	Kasongo
		Kibombo	Kibombo
		Kihembwe	Kihembwe

PROVINCE OF ELISABETHVILLE

Headquarters: Elisabethville

Tanganika	Albertville	Moba	Moba
		Albertville	Albertville
		Ankoro	Ankoro
		Kongolo	Kongolo
		Mwanza	Mwanza
Lualaba	Jadotville	Sandoa	Sandoa
		Malonga	Malonga
		Kamina	Kamina
		Kabongo	Kabongo
		Bukama	Bukama
		Jadotville	Jadotville
Haut-Katanga	Elisabethville	Sampwe	Sampwe
		Kasenga	Kasenga
		Elisabethville	Elisabethville

RUANDA-URUNDI

Headquarters: Usumbura

Residencies	*Headquarters*	*Sub-districts*	*Headquarters*
Ruanda	Kigali	Kigali	Kigali
		Nyanza	Nyanza
		Astrida	Astrida
		Shangugu	Shangugu
		Biumba	Biumba
		Kibungu	Kibungu
		Ruhengeri	Ruhengeri
		Kisenyi	Kisenyi
Urundi	Kitega	Usumbura	Usumbura
		Gozi	Gozi
		Muhinga	Muhinga
		Kitega	Kitega
		Ruyigi	Ruyigi
		Rutana	Rutana
		Bururi	Bururi

CHAPTER X

DISTRIBUTION OF POPULATION AND GAZETTEER

The Population of the Belgian Congo

The Belgian Congo is almost half as big as Europe excluding Russia—902,000 compared to 2,085,000 square miles—but its inhabitants number little more than the combined populations of Greater London and Birmingham. The estimated population in 1941 was 10,354,000, of whom only about 27,800 or 0·27 per cent. were European. The proportion of Africans to Europeans is nearly four hundred to one.

Some of the tribes are powerful and occupy great areas of the country; as, for example, the Azande in the north-east and the Baluba in the south-east; others occupy comparatively restricted areas, and some seem to be mere fragments of some greater organization of the past. If there are many tribes there are also many dialects which, although mainly derived from a common Bantu parent, sound as if they had nothing in common. There are, however, other peoples besides those of Bantu stock, and there are probably fifty or more dialects spoken in the Congo basin. Customs differ as much as dialects, for each tribe has its own, which may or may not be found among its neighbours. For example, among some tribes it is accounted a shocking thing for a man to see his wife's mother. He will hide himself, or at least cover his face, when he knows that she is near, whereas among others, whatever precautions a man may take to avoid his mother-in-law, no moral duty is involved.

Europeans in the Belgian Congo

The term 'European' must be taken to include all those to whom the natives give the title *mundele* or white-men. As has been stated, there were 27,790 Europeans in the colony in 1941. Of these 19,210, or about 70 per cent., were Belgians. This proportion has not always been so high, but during the War of 1914–1918 Belgian army officers served in the Congo and took home with them a good report of the land, persuading a number of young Belgians to work there.

The following table shows the rate at which European settlement has taken place over a period of twenty-five years.

TABLE I. *Rate of European Settlement*

	1917	*1921*	*1925*	*1929*	*1933*	*1937*	*1941*
Belgians	3,263	3,588	7,770	15,900	12,045	13,760	19,210
Others	3,032	3,383	5,025	7,376	6,676	6,343	8,580
TOTAL	6,295	6,971	12,795	23,276	18,721	20,103	27,790

In the years between 1925 and 1929 the European population almost doubled itself. This was a period of seeming prosperity in the colony. But the financial troubles which afflicted the world in 1931 did not leave the Congo unscathed, and by 1933 the European population was reduced by 20 per cent.

Nationalities of European Residents. The nationalities of the European residents are given in Table II. In this table the year 1917 (the year of publication of the last handbook) is compared with 1941.

TABLE II. *Nationalities of European Residents compared*

	1917	*1941*
Belgian	3,263	19,210
Portuguese	313	1,825
Italian	275	1,543
British	820	1,375
Greek	103	968
American	188	675
Dutch	109	537
French	9	408
Luxemburger	89	287
Norwegian	201	21
Swiss	575	193
Russian	..	127
Swedish	36	105
German	..	65
Polish	..	63
Others	314	388
	6,295	27,790

Besides the increase in the number of Belgians, the facts to be noted are the numbers of Portuguese and Italians who have entered the colony, and the decrease in the numbers of Swiss and Norwegians. For the most part the Portuguese are small traders and shopkeepers, who opened their doors as trade expanded. Italians excel as engineering foremen and as agricultural workers. As for the Russians, affairs in their own country caused some to seek a livelihood in the Congo as well as elsewhere. The decrease in the number of Swiss is surprising and has not been explained. Previously Norwegians were largely employed in the army and in the marine. The majority did not renew their contracts when they terminated.

Employment of Europeans in the Colony. The majority of the British residents, other than missionaries, are engaged in mining, engineering, and the palm-oil industry. Americans are also engaged in mining, and there are a number of American missionaries.

According to official figures published in 1937, 10 per cent. of the total European population were in government service, over 16 per cent. were missionaries, either Protestant or Roman Catholic, whilst the remainder are described as civilians (*particuliers*). Later figures suggest that the population can be divided into the following categories:

TABLE III. *European Occupations*

Categories	*Numbers*	*Approximate percentage*
Government services	2,500	9
Missionaries (include teachers, nurses, &c.)	4,100	15
Employees in private firms	7,800	28
Independent	2,600	10
Women (other than missionaries)	6,200	22
Children	4,600	16
TOTAL	27,800	100

Distribution of the European Population. The distribution of the European population among the provinces of the colony is estimated as given below.

TABLE IV. *European Distribution*

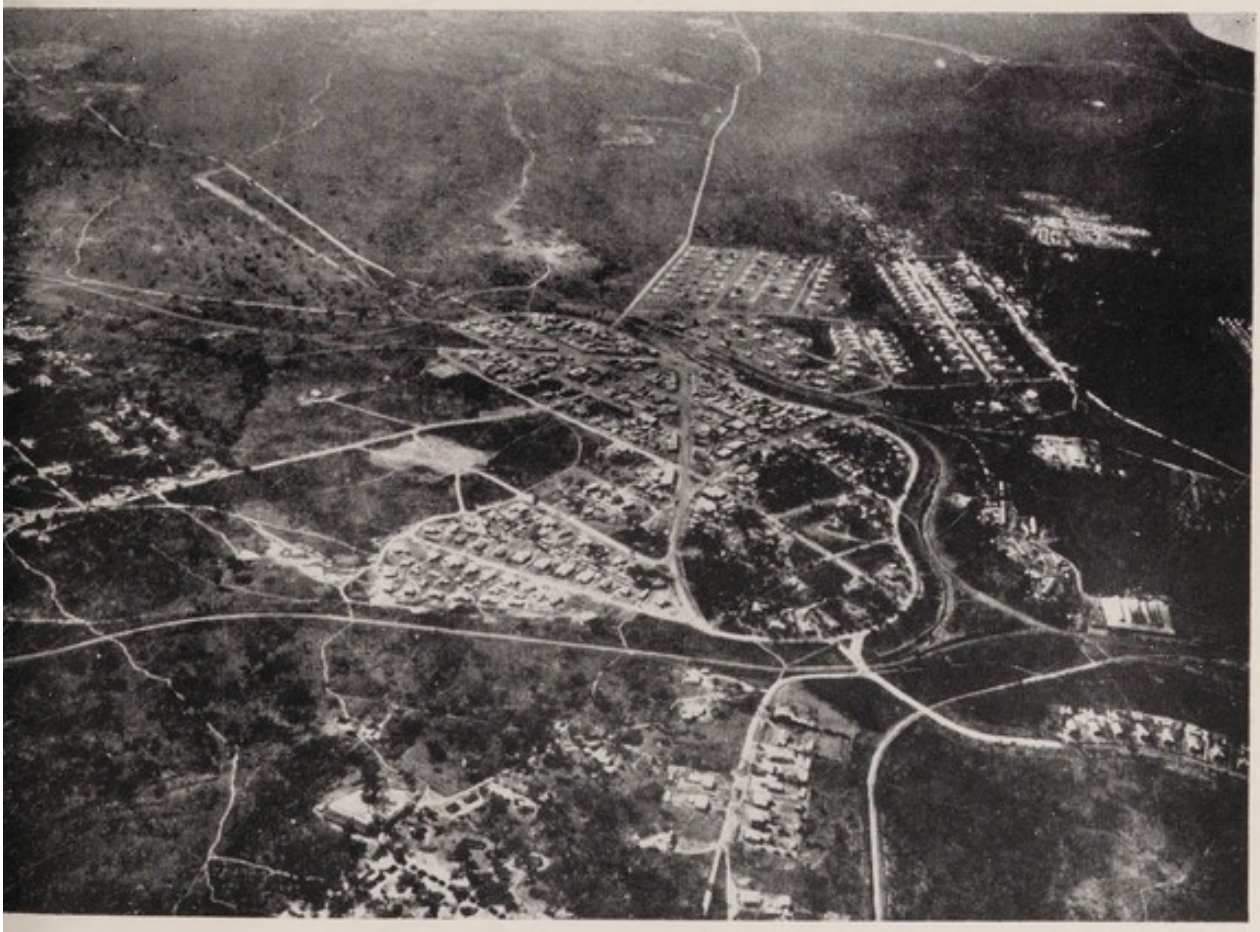
	1937	*1941*
Elisabethville province	6,200	8,170
Leopoldville »	4,850	6,190
Stanleyville »	3,750	5,110
Costermansville »	1,900	2,930
Lusambo »	1,700	2,720
Coquilhatville »	1,700	2,680
TOTAL	20,100	27,800

Because of the mining industries of southern Katanga and its relatively healthy climate, it is natural that Elisabethville province should carry the greatest proportion of Europeans, who are, therefore, concentrated in the south at and near Elisabethville, Jadotville, and the neighbouring mines.

It is natural too that Leopoldville province should carry a large proportion. It is not so industrialized, neither is it so healthy, as Katanga, but it contains the capital and the chief port of the country. A considerable number of Europeans are to be found in the towns of Boma, Matadi, Thysville, and Leopoldville.



64. *Aerial view of Elisabethville. The cathedral left centre. Railway station centre of background*



65. *Aerial view of Jadotville*



66. *Banana. The pilot boat at the pier*



67. *Boma. General view of port, flood season. Floating dock, bottom right-hand corner*

Stanleyville province contains the important town of the same name and also mining areas, including the gold mines of Kilo. Town and mines absorb the energies of many, both black and white.

In all provinces Europeans are scattered about in lonely estates or administrative centres ('bomas' as they are called in East Africa). Missionaries live at their stations; officials and traders in the posts described in the Gazetteer; and in most provinces there are a few planters. It would be misleading to give a detailed analysis of this scattered population at any one time, for posts are closed or stations given up, and new ones take their place as the administration, health, and trade of a vast and rapidly changing territory dictate.

Native Population

Early estimates of the number of natives are surprising in their diversity. In 1885 Stanley estimated that there must be over 43,000,000 people in what he calls 'the upper Congo section' alone. Earlier still Dr. Schweinfurth estimated the strength of the Azande tribe to be 2,000,000 and the density of their population as 370 persons per square mile. As late as 1910 the population of the whole country was estimated at 15,000,000, but by 1917 the estimate had fallen to 7,000,000. Mortality has been, and is, high in the Congo, but early estimates were far too optimistic and can be dismissed.

The total number of natives in the colony on 31 December 1937 was about 10,217,400. The figures for 1937 showed that men numbered 3,032,600 or 29·8 per cent., women 3,214,977 or 31·6 per cent., and children 3,969,823 or 38·6 per cent.

Increase of Population. In 1917, as has already been stated, the native population was estimated to be 7,000,000. Since that date there has been a steady, but by no means uniform, increase.

TABLE V. *Increase of Native Population*

Year	*Increase*
1928	297,987
1929	454,163
1930	129,356
1931	108,765
1932	204,338
1933	105,613
1934	220,896
1935	489,218
1936	271,540
1937	170,677

Some of the discrepancies noticeable in this statement are easily

explained. In one year it was discovered that a number of men were counted twice, first at their own villages and then at their place of employment, and this mistake may easily have been repeated. The vastness of the country and the distances which labour travels makes an accurate check almost impossible. On the information available it is only safe to say that the native population is increasing at the rate of from 100,000 to 400,000 per annum.

Birth- and Death-rates. It is, therefore, very difficult to come to an entirely satisfactory conclusion concerning the actual birth- and death-rates among the Congolese. It is impossible to keep returns comparable to those of European countries, for the majority of natives are illiterate, nor can they count very accurately. Some tribes too would resent an order to keep count of births and deaths. Under the circumstances the Government has done the best it can; it has attempted to make a cross-section of each province, and the following table shows the results for 1937.

TABLE VI. *Native Birth- and Death-rates in Selected Areas* (1937)

Province	*Total number of natives for whom records are available*			*Births*	*Deaths*			*Excess of births over deaths*	*Rate of increase per 1,000*
	Old people	*Adults*	*Children*		*Old people*	*Adults*	*Children*		
Leopoldville	4,552	57,241	44,769	3,742	377	915	1,143	1,307	12·26
Coquilhatville	6,258	69,112	48,028	4,440	827	1,196	1,120	1,297	10·51
Stanleyville	8,353	82,853	51,259	4,253	977	1,559	1,348	369	2·59
Costermansville	3,799	26,869	21,721	1,867	364	409	797	297	5·67
Elisabethville	5,553	33,573	23,919	1,824	468	478	660	218	3·46
Lusambo	6,834	45,570	32,671	2,633	716	784	897	236	2·77
TOTAL	35,349	315,218	222,367	18,759	3,729	5,341	5,965	3,724	6·50

The following table has been prepared on the assumption that the cross-sections of the provinces yield a fair average for the country as a whole.

TABLE VII. *Native Birth- and Death-rates in the Belgian Congo*

Year	*Births per 1,000 of population*	*Deaths per 1,000 of population*	*Natural increase per 1,000*
1930 . . .	34·73	28·82	5·91
1931 . . .	31·44	25·87	5·57
1932 . . .	31·70	25·56	6·14
1933 . . .	31·65	24·11	7·54
1934 . . .	31·51	23·55	7·96
1935 . . .	30·71	24·22	6·49
1936 . . .	31·28	24·04	7·24
1937 . . .	32·74	26·24	6·50

For the sake of comparison some typical birth- and death-rates are given:

TABLE VIII. *Some Comparative Birth- and Death-rates* (1936)

	Birth-rate per 1,000	*Death-rate per 1,000*	*Natural increase per 1,000*
England and Wales.	14·8	12·1	2·7
Belgium . .	15·2	12·8	2·4
Canada . .	20·0	9·7	10·3
S. Africa (European)	24·2	9·6	14·6
Italy . . .	22·4	13·7	8·7

Density of Native Population

TABLE IX. *Average Density of Native Population by Districts in 1937*

District	*Population*	*Area of square miles*	*Density per square mile*
Leopoldville province			
Urban District of Leopoldville.	33,710	33,600	19·4
Bas-Congo	619,880		
Kwango	1,058,270	60,500	17·4
Lac Leopold II . . .	285,930	42,400	6·7
	1,997,790	136,500	14·6
Coquilhatville province			
Tshuapa	741,040	89,860	8·3
Congo-Ubangi . . .	816,930	68,140	12·0
	1,557,970	158,000	9·8
Stanleyville province			
Stanleyville	636,110	68,300	9·3
Uele	921,130	79,350	11·6
Kibali-Ituri	824,970	49,350	16·7
	2,382,210	197,000	12·1
Costermansville province			
Kivu	985,500	36,170	27·2
Manyema	316,930	51,220	6·2
	1,302,430	87,390	14·9
Elisabethville province			
Haut-Katanga . . .	176,070	46,460	3·8
Lualaba	477,010	87,450	5·4
Tanganika	369,980	52,990	7·0
	1,023,060	186,900	5·5
Lusambo province			
Kasai	1,078,060	52,300	20·6
Sankuru	875,870	83,900	10·4
	1,953,930	136,200	14·3
TOTAL	10,217,390	901,990	11·3

Some general conclusions can be drawn from this information. Firstly, the average density is low throughout the whole territory. Compare the figure for the Congo—11·3 persons per square mile—with the 702 for Belgium, 468 for Great Britain, 134 for Palestine, 86 for Malaya, 44 for Egypt, and 12 for the Union of South Africa. Secondly, the population tends to be more dense on the highlands which surround the Congo basin, or on the slopes of the highlands, than at the lower levels of the basin, on the Congo plain or in the forests. The reasons for this fact are to be found in Chapters III, IV, and VI, but may be recapitulated briefly. The climate of the lowest, and forest, level is the least healthy and large areas are under perpetual marsh. The forest itself is difficult to clear, movement is restricted, and life must be organized in small communities. Villages are concentrated as much as possible on the river banks for ease of administration, but the soil is not rich and few cereal crops can be grown. Manioc is the staple food. On the other hand, as the forest gives way to savanna intercourse is easier, larger communities develop, and cereals—millet in the north and maize in the south—provide better food. Population begins to increase. The rule is not without its exceptions. Haut-Katanga, for example, is well outside the forest area, but its swampy valleys, though fertile, have seen serious outbreaks of sleeping-sickness, and are now poorly settled. The Lualaba district, with a population density of only 5·4 to the square mile, is of the same character. Manyema, another exception, has been decimated by sleeping-sickness, slave-raiding, and fierce native war. These exceptions do but prove the rule.

The inhabitants of the various regions often bear the hall-mark of their place of origin. Thus a man from the forest will ask for manioc, one from the northern plateaux for millet, and one from the southern highlands for maize. All of them take unkindly to unfamiliar foods. Forest natives will wear grass or palm-leaf fabrics, and those from the highlands the skin of some animal, unless they have learnt to wear cotton.

Pygmies. Statistics concerning the pygmies are, naturally, the most unreliable of all. While the forest-dwelling agriculturalists tend to build their villages on river banks, the pygmies dwell in the forest depths. The Bantu tribes have a variety of names for these people, such as: Afe, Aka, Atiki-tiki, Atschua, Bafete, Baka, Bakwa, Bambuti, Batua, Batwa, Efe, Ifi, Mambuti, Tiki-tiki, Wambatti, and Watwa. The most common name is Batwa. In some cases the difference of name may indicate a difference of tribe, in others it does but reflect

the fancy of the local Bantu. It has already been said that pygmy culture is so much in keeping with the virgin forest, so thoroughly adapted to it, that its existence outside its limit would be impossible.

It is estimated that 15,000–20,000 pygmies, under the names of Aka, Bambuti, Basa, Basua, and Efe, roam about in the region of the upper Ituri and Bomakandi rivers in the Kibali–Ituri district. Pygmies (the Bafoto) are also found between the Congo and the Lopori, near Lake Mweru (the Batembo), and about the Lindi river in Stanleyville district (the Basua). They are known as the Batwa near the Busira river, on the upper Salonga, between the Sankuru and Kasai, and on the upper waters of the Sankuru. They also have the same name as far afield as Lake Bangweulu and to the west of Lake Tanganyika, south of Albertville. Near Lake Tumba they become the Batsua and near Lake Leopold II the Bacwa. About the upper waters of the Lukenie they are the Mato. These pockets of pygmy tribes have escaped extermination only by their skill in forest craft.

Settlement of Tribes. If the distribution of the population in the Congo is to be appreciated it must be remembered that only within the memory of man have some of the tribes been anchored to their present areas. Before the advent of settled government there were sudden and often unexpected migrations of peoples from north, south, and east of the Congo basin. These irruptions were caused by distant wars, slave-raiding, famine, pestilence, the search for fresh pastures, or, in some cases, by a mere lust for conquest. They displaced not only those who were directly in the line of advance but also, indirectly, tribes farther afield. Instances may be given. The ruling class of some tribes in the Kasai district claim to be of the Abira tribe which came from the region of Lake Chad. The Azande or Niam-Niam of the Uele district probably came from the Nile basin. The Bayaka of the Kwango district came from the south, and the Baluba of the Katanga and Tanganyika districts from the east. The Bateke about Stanley Pool have travelled far and fought many wars. Such movements are impossible to-day. Tribes have been obliged to settle where a European administration found them. Some of the tribal areas are larger than an English county, and some have been split into scattered fragments by the intrusion of alien tribes. The whole pattern of tribal settlement is irregular and is like that of a jig-saw puzzle.

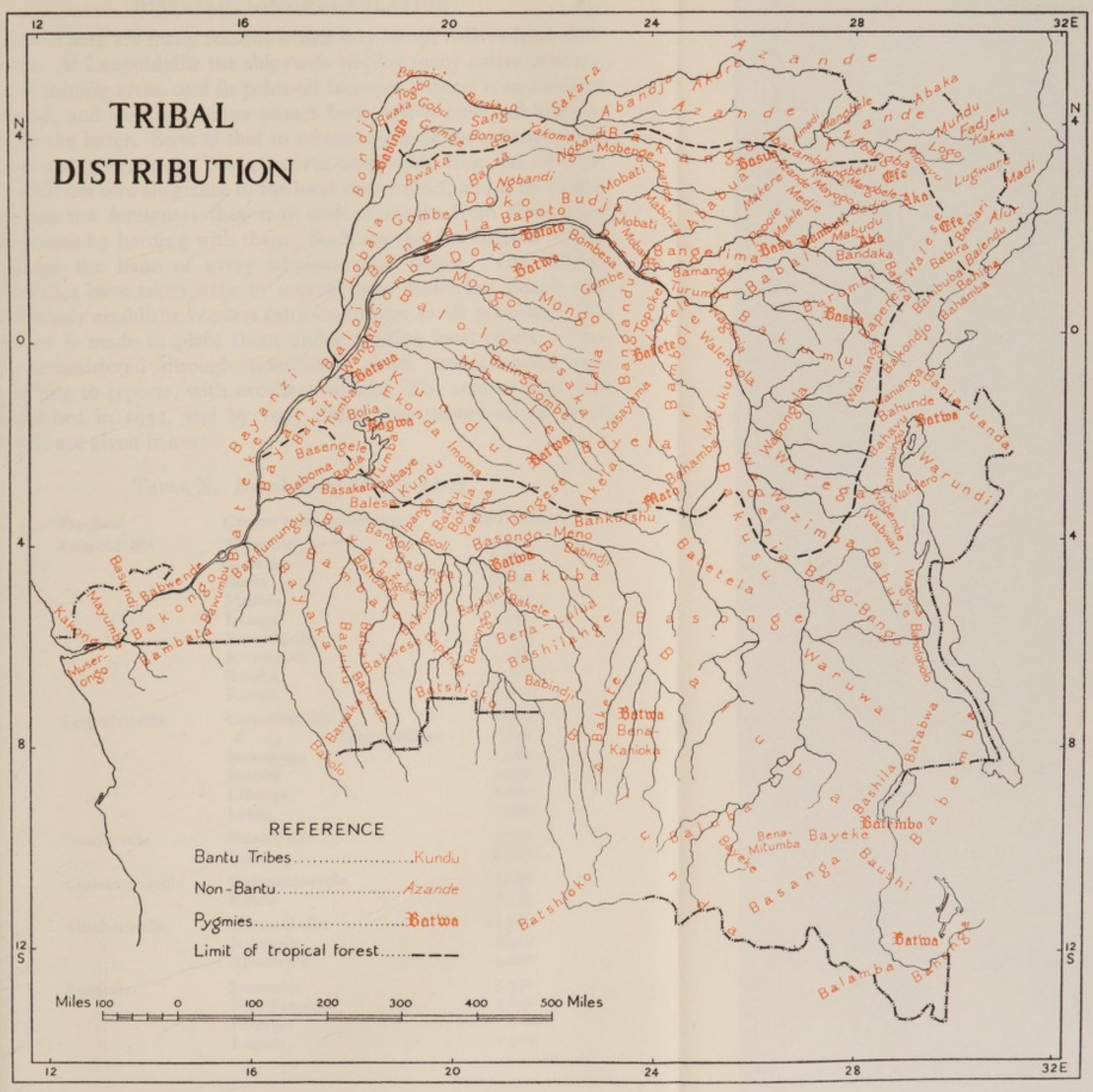
Distribution of Tribes (Fig. 46). Exhaustive information about the tribes, their respective numbers and the boundaries between

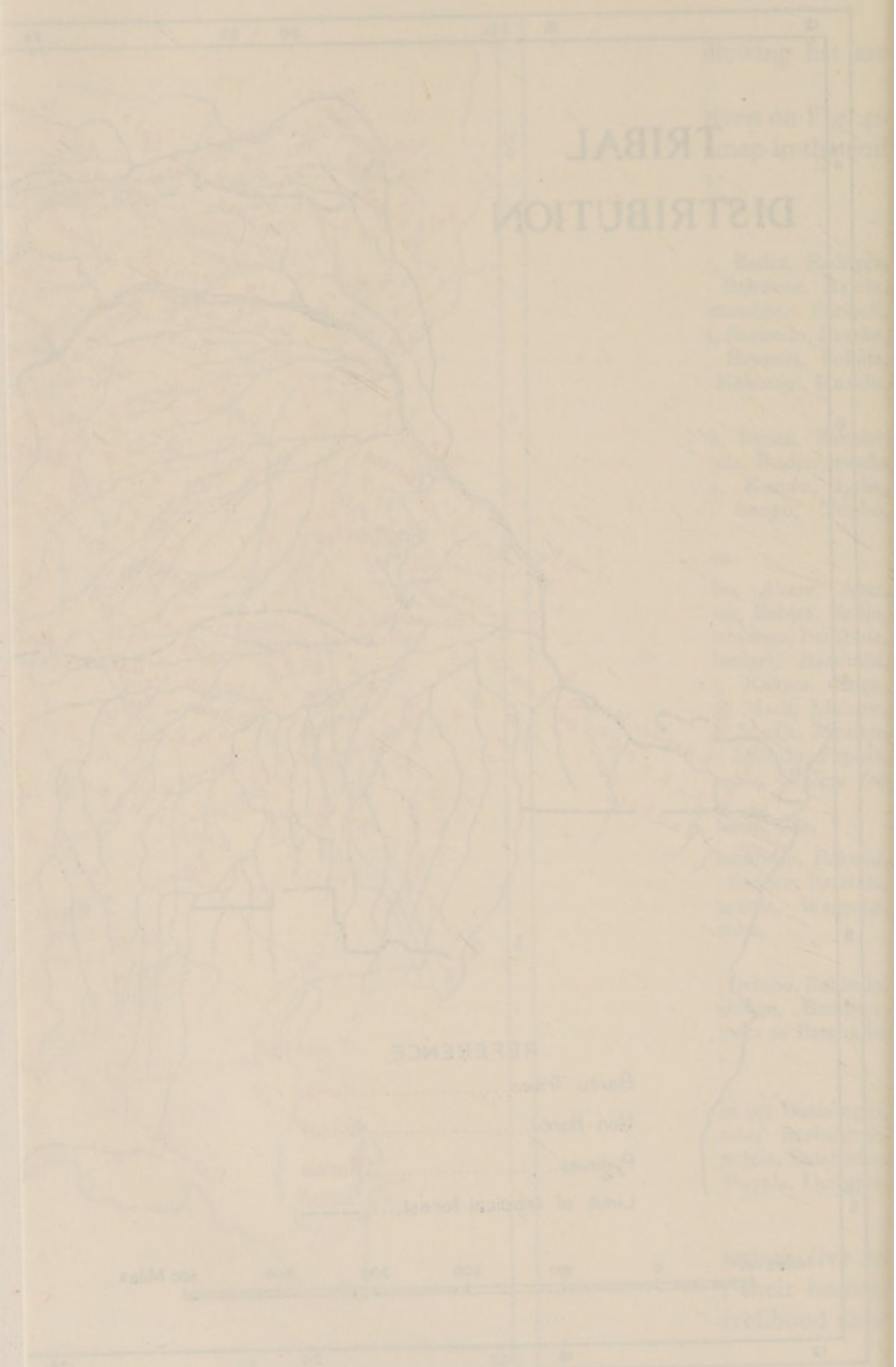
them, is not available. Neither Fig. 46 nor the following list are complete, therefore.

The spelling and the location of the tribal names given on Fig. 46 differ, here and there, from those of the topographical map in the end pocket, and should be accepted as preferable to them.

Province	*Tribes*
Leopoldville	Babaye, Baboma, Babunda, Babwende, Badia, Badinga, Baholo, Bahuana, Bakongo, Bakuti, Bakwese, Balesa, Balua, Bambala, Bambata, Bamfumungu, Bangoli, Bapende, Basakata, Basengele, Basuku, Basundo, Bateke, Batitu, Bawaka, Bawumbu, Bayaka, Bayanzi, Bokala, Bolia, Booli, Ekonda, Imoma, Ipanga, Kakongo, Kundu, Mayumbe, Tumba, Yaelima.
Coquilhatville	Bakuti, Balinga, Baloi, Balolo, Bangala, Banza, Banziri, Bapoto, Bayanzi, Bongo, Bosaka, Boyela, Budja, Bwaka (or Bondjo), Doko, Gobu, Gombe, Kundu, Lalia, Lobala, Mbole, Mongo, Ngbandi, Sango, Togbo, Wangata, Yakoma, Yasayama. (Pygmies) Babinga, Bafoto, Batsua, Batwa.
Stanleyville	Ababua, Abandja, Abangba, Abarambo, Akare, Alur, Amadi, Azande (or Niam-Niam), Babali, Babira, Badjo, Bahima, Bakango, Bakumu, Balendu, Bamanga, Bambole, Bandaka, Bangandu, Bangelima, Baniari, Barumbi, Basoko, Bombesa, Fadjelu, Gombe, Kakwa, Logo, Lokele, Lugware, Mabinza, Mabudu, Madi, Makere, Malele, Mangbele, Mangbetu, Mayogo, Medje, Mituku, Mobango, Mobati, Mobenge, Momvu, Mundu, Popoie, Topoke, Turumbu, Wagenia, Walengola, Walese (or Balese), Wasongolo. (Pygmies) Aka, Bambuti, Bafete, Basa, Basua, Efe.
Costermansville	Babuye, Bahamba, Bahavu, Bahunde, Bakondjo, Bakusu, Bambuba, Bango-Bango, Baniabungu, Bapere, Batetela, Wabembe, Wabwari, Wafulero, Wagenia, Wagoma, Wanianga, Warega, Wasongola, Wazimba. (Pygmies) Basua, Batwa.
Elisabethville	Babemba, Baholoholo, Bahonga, Balamba, Baluba, Balunda, Bango-Bango, Basanga, Bashila, Basonge, Batabwa, Baushi, Bayeke, Bena-Kanioka (or Kanyoka or Batshioko or Balungu), Bena-Mitumba, Waruwa. (Pygmies) Batembo, Batwa.
Lusambo	Akela, Babindji, Bahamba, Bakete, Bakuba (or Bushongo), Baluba, Balunda, Bankutshu, Bapende, Bashilange, Bashilele, Basonge, Basongo-Meno, Batetela, Batshioko, Bawongo, Bena-Kanioka, Bena-Lulua, Boyela, Dengese. (Pygmies) Batwa, Mato.

Detribalized Natives. Although the majority of natives live in their own tribal areas, there are those who have left their homes, either temporarily or permanently, in order to seek a livelihood else-


TRIBAL DISTRIBUTION
12
16
20
24
28
32E
4N
0
4S
8
12S
REFERENCE
Bantu Tribes.....Kundu
Non-Bantu.....Azande
Pygmies.....Batwa
Limit of tropical forest.....
Miles 100 0 100 200 300 400 500 Miles
Azande
Mangbetu
Efe
Aka
Basua
Batwa
Batua
Batetela
Batumbo
Bambuba
Bahamba
Warundi
Warega
Waruwa
Bangelima
Mongo
Bakuba
Basongo-Meno
Bena-Kanioka
Bena-Mitumba
Bayeke
Basanga
Batshioko
Batshioto
Babindji
Bashilange
Batabwa
Babemba
Baushi
Balamba
Bahemba
Bakongo
Bambata
Bayanzi
Bateke
Bayaka
Basakata
Bakumu
Bakondjo
Bahunde
Bahavu
Babwari
Bahumbu
Bakwesi
Bakwese
Bena-Lulua
Bena-Kamuina
Bena-Kanioka
Bena-Mitumba
Bena-Bashila
Bena-Bayeke
Bena-Basanga
Bena-Baushi
Bena-Balamba
Bena-Bahemba
Bena-Batabwa
Bena-Batumbo
Bena-Bambuba
Bena-Bahamba
Bena-Balendu
Bena-Babira
Bena-Bahira
Bena-Alur
Bena-Banari
Bena-Wale
Bena-Bakondjo
Bena-Bahunde
Bena-Bahavu
Bena-Babwari
Bena-Wafuliro
Bena-Warundi
Bena-Warega
Bena-Waruwa
Bena-Babuye
Bena-Bango-Bango
Bena-Bangelima
Bena-Babali
Bena-Bakumu
Bena-Bakusu
Bena-Baketela
Bena-Bakete
Bena-Bakwese
Bena-Bakwesi
Bena-Bakwese
Bena-Bakwese
Bena-Bakwese



where. There are many reasons which may tempt natives from their homes. At Leopoldville the shipyards employ many native workers. In the mining areas, and in palm-oil factories, labour is in constant demand, and military camps attract both native men and women, chiefly the latter. So it is that in certain areas of the colony, about towns and government posts, natives congregate from far or near. They do not owe allegiance to the local native chief, and if by chance they are not foreigners they may seek to escape from their tribal obligations by herding with them. Such are the detribalized natives who are the bane of every administrative officer. The Belgian authorities have taken steps to control these masterless people and have wisely established *centres extra-coutumiers* in all provinces. No attempt is made to place them under existing local chiefs. They are administered through nominated chiefs and councils, and, according to reports, with excellent results. The centres were first established in 1932, and by 1937 there were twenty-six of them. Details are given below:

TABLE X. *Detribalized Native Zones*

Province	*Centres extra-coutumiers*	*Population*
Leopoldville	Thysville	2,900
	Matadi	8,780
	Boma	6,820
	Mushie	2,130
	Inongo	1,440
	Banningville	2,560
	Kwamouth	1,030
	Bolobo	4,070
	Kikwit	2,920
Coquilhatville	Coquilhatville	8,480
	,, fishing-village	1,720
	Basankusu	1,540
	Bumba	3,370
	Libenge	2,520
	Lisala	1,490
Stanleyville	Stanleyville	9,610
	Buta	8,711
Costermansville	Costermansville	2,160
	Kindu	7,150
Elisabethville	Elisabethville	13,980
	Jadotville	3,310
	Albertville	5,420
Lusambo	Lusambo	5,770
	Port Francqui	2,890
	Basongo	720
	Luputa	1,500

In the centres of Leopoldville, Coquilhatville, and Elisabethville provinces the proportion of men to women is higher than in tribal areas. In the former 43–46 per cent. of the total population are men and only 26–34 per cent. are women, whereas in the latter 29–30 per cent. are men and 31–32 per cent. are women.

The Population of Ruanda-Urundi

At the end of 1938 the population of the mandated territory of Ruanda-Urundi was estimated at 3,783,954 persons, divided into the following groups:

Natives of tribal areas	3,752,742
Natives in detribalized centres	29,028
Europeans and Americans	1,227
Asiatics and others	957
Total	3,783,954

The territory is about 20,540 square miles in area, that is not quite so large as Eire. Eire has a density of 112 persons per square mile; the density in Ruanda-Urundi is 184.

It is a matter of history that Germany prized this part above all others of its East African territory. Indeed the two countries of Ruanda and Urundi are capable of supporting, and do support, a greater population than their near neighbours, a fact which bears testimony to the fertility of the soil and to the excellence of the climate. The Belgian Congo, which is over forty-four times their size, has less than three times their population; Uganda is about four times as great and has roughly the same number of native inhabitants; Tanganyika Territory, which has half as many people again as Ruanda-Urundi, has twelve times the area.

European Population. Table XI gives the numbers and occupations of inhabitants of European stock in 1938.

There are mines in the north of Ruanda and in the east of Urundi, and these found employment for 98 Europeans—directors, engineers, mechanics, accountants, and doctors—all of whom are included in the analysis given below. Government officials and missionaries are scattered fairly evenly over the territory, and the remaining Europeans are to be found in or not far from the small towns or posts.

Foreigners, not of European Stock, and Africans not born in Belgian Territory. Table XII gives numbers and employments in 1938.

TABLE XI

Nationalities		*Occupations*	
Belgian	788	Missionaries	345
French	73	Government officials	171
British	64	Commercial agents	47
Greek	57	Works managers and foremen	33
Dutch	38	Shopkeepers	28
American	37	Prospectors	21
Italian	32	Mining engineers	14
German	28	Planters	13
Portuguese	24	Mechanics	13
Swiss	21	Company directors	9
Luxemburger	16	Contractors	9
Swedish	14	Doctors	8
Others	35	Accountants	6
		Hotel keepers	6
		Bankers	4
		Garage proprietors	4
		Employees of above	73
		Without profession, including women and children	423
TOTAL	1,227	TOTAL	1,227

TABLE XII

Descriptions		*Occupations*	
Arabs	435	Small traders and shopkeepers	210
East Indians (including 17 Baluchis)	327	Clerks (mostly Indian)	39
Senegalese	20	Chauffeurs	12
Others (including half-caste Asiatics, not recognized by their fathers)	175	Carpenters	4
		Masons, barbers, tailors, mechanics	14
		Without profession (including women and children)	678
TOTAL	957	TOTAL	957

The small trader lives in such places as Usumbura, Kitega, Kigali, and other administrative centres, as well as near the mines. The clerks are often employed by the mines.

Detribalized Africans. Africans of other than local tribes have settled in the territory for a variety of reasons. There are rather more in Urundi than Ruanda, and their numbers, in 1938, were as follows:

TABLE XIII. *Detribalized Population*

	Men	*Women*	*Children*	*Total*
Ruanda	3,741	3,068	3,845	10,654
Urundi	6,953	6,246	5,175	18,374
TOTAL	10,694	9,314	9,020	29,028

The proportion of men to women and children is somewhat higher than in the Belgian Congo.

Natives of Tribal Areas. In the easy fashion of the African, the tribes of the two countries have been dubbed the Wanyaruanda and the Warundi, but these names simply mean the people of Ruanda and Urundi respectively, and tend to obscure the fact that there are peoples of very different ancestries in the two countries. There is a remnant of a pygmy tribe, known as the Watwa (corresponding to the Batwa of Belgian Congo), which lives in the region of swamps and in thick bush; but the bulk of the population, both in Ruanda and Urundi, is of the Wahutu tribe, of Bantu stock. They have been subjugated by the Watusi from the north. The Wahutu themselves are divided into the Walera, Wakiga, Wahoro, and other sub-tribes, but unfortunately figures are not available to show their respective numbers. The Watusi, as the ruling caste, are but a small element of the population, estimated some years ago as between 5 and 7 per cent. On this basis the Watusi would number between 180,000 and 260,000 men, women, and children. It should be remarked that the Watusi are not isolated from the Wahutu, but live among them wherever suitable pasture for their long-horned cattle can be found.

The census of 1938 divided the native population of tribal areas according to age and sex as follows:

TABLE XIV. *Population of Tribal Areas*

	Men	*Women*	*Boys*	*Girls*	*Total*
Ruanda .	453,906	495,261	474,456	465,267	1,888,890
Urundi .	414,588	553,044	442,286	426,934	1,836,852
TOTAL	868,494	1,048,305	916,742	892,201	3,725,742

In Ruanda the greatest concentration of people was in the Nyanga district, in Urundi it was about Kitega.

Native Birth- and Death-rates. In 1938 the Belgian Government gave the following figures for native births and deaths.

TABLE XV. *Vital Statistics*

		Births		*Deaths*		
Numbers in the group studied		*Boys*	*Girls*	*Men*	*Women*	*Children*
Ruanda . .	106,414	2,223	2,296	623	766	1,477
Urundi . .	20,661	497	487	137	134	413
TOTAL . .	127,075	2,720	2,783	760	900	1,890

These figures put the birth-rate per thousand at 42·4 in Ruanda and 47·6 in Urundi, giving a mean figure of 43·3. The death-rate for Ruanda is 26·9, for Urundi 33·1, and for the whole 27·9.

GAZETTEER

All the places described are on the communications map, but not all are on the topographical. All longitudes are East.

THE following pages contain brief descriptions of the more important settlements in the Belgian Congo. Many of the place-names have alternative spellings, and descriptions are given under that rendering used on the topographical map. In order to facilitate reference, each description begins with a latitude and longitude, in agreement with the plotting of this same map, which are quite possibly several minutes of arc in error. Few of the places mentioned possess the amenities to which Europeans have grown accustomed. Taxis, telephones, cafés, cinemas, hotels, lifts, and even refrigerators may be absent, and, where they do exist, may have a certain exotic flavour. If this is true of the great centres such as Leopoldville, Stanleyville, and Elisabethville, it is doubly true of the small settlements which are scattered throughout the country. Often these cannot be dignified by the name of 'town', nor can they be defined as villages. Probably 'post'—administrative or trading as the case may be—is the most appropriate name. Generally a post contains sufficient buildings to accommodate an administrative officer and such subordinate staff as he may have, a post office, and huts ments for native police, native labourers, or perhaps a company of the Force Publique. There is usually a market for native produce in the post itself or on its borders, and there are native dwellings which may or may not be set out in regular streets or roads. Most posts also contain a few 'stores' owned, if not occupied, by Europeans. At these stores local produce is bought, and imported goods such as cloth, tinned food, and native trade goods are sold. They may be but corrugated iron shanties or mud and wattle huts, or may be solidly built of brick, stone, or concrete. The type of building depends a good deal on transport facilities, and on what European building materials are available. If these materials are not obtainable, then grass must be used for thatching and mud for mortar. Generally there is little more to see at a post than a sample of native life as it is lived in contact with European influences. In the pages which follow little if any mention is made of natives, but it must always be assumed that they are present, either in the post or nearby.

ABA. Lat. 3° 50′ N., long. 30° 12′. Stanleyville province. Kibali-Ituri district. Faradje sub-district.

A small post on the boundary of the Sudan. Motor-roads from Mungbere, a terminus of the Vicicongo railway, to Juba, and from Niangara to Juba, pass through the station. It contains post, customs, and immigration offices. The Banque Commerciale du Congo has a branch here. There is an hotel belonging to the Société du Haut-Uele et du Nil, and a cotton ginnery of the Compagnie Cotonnière Congolaise (Cotonco). Mission stations of the Africa Inland Mission and of the White Fathers are in the vicinity.

AKETI (PORT CHALTIN). Lat. 2° 42′ N., long. 23° 51′. Stanleyville province. Uele district. Aketi sub-district.

The headquarters of the sub-district, it lies on the Itimbiri river near the limit of navigation from Stanley Pool and at the terminus of the Vicicongo railway. A wireless telegraphy station, sometimes reported, is not active. The settlement contains a post office, two banks—the Banque Commerciale du Congo and the Banque du Congo Belge—one hotel (the Mabinza), and a cinema. There are Portuguese and other trading stores and the railway repair shops of Vicicongo. Electric light is supplied by the Société Coloniale d'Electricité (Coletric). Coffee plantations have been established in the neighbourhood. There is a Cotonco ginnery. A mission station of the Premonstratensian Fathers is nearby. From Aketi a road runs eastwards through Niangara and Aba to the Sudan.

ALBERTA. Lat. 2° 15′ N., long. 22° 25′. Alt. 1,260 feet. Coquilhatville province. Congo-Ubangi district. Bumba sub-district.

Alberta, 9 miles from Bumba, is the centre of a palm-nut collecting area and includes the palm-oil factory of the H.C.B., and the native hospital belonging to the same body. There is a mission station of the Scheut Fathers.

ALBERTVILLE. *See* Chapter XI.

ANGO. Lat. 4° 03′ N., long. 25° 53′. Stanleyville province. Uele district. Ango sub-district.

The headquarters of the sub-district, Ango lies on the left bank of the Uele river, about 18 miles from Api. It has a sub-post office, a Cotonco ginnery, a mission station of the Croizier Fathers, and a

small commercial quarter. This post is near the great elephant reserve, and is connected by road with Api.

ANGO ANGO. *See* Chapter XI.

ANKORO. Lat. 6° 49′ S., long. 26° 49′. Elisabethville province. Tanganika district. Ankoro sub-district.

Ankoro is the administrative centre of the sub-district and lies on the left bank of the Lualaba, about 50 miles upstream from Kabalo, opposite the mouth of the Luvua river (which is navigable for some 70 miles upstream). It contains a sub-post office, a mission station of the Holy Ghost Fathers, and a small commercial quarter. Motor transport is available for use on local roads. An emergency landing-ground lies to the west.

API. Lat. 3° 41′ N., long. 25° 27′. Stanleyville province. Uele district. Ango sub-district.

Api is on the left bank of the Uele river, 30 miles north of Titule. It is noted for its elephant farm and training ground established by the Institut National d'Études. Nearby there is also a cotton ginnery maintained by the Comptoir Colonial Belgika.

ASTRIDA. Lat. 2° 35′ S., long. 29° 43′. Ruanda Residency. Astrida sub-district.

Astrida is the administrative headquarters of the sub-district. It contains a veterinary post, an hotel, and a mission station of the White Fathers. The Brothers of Charity keep a school, to which the Government makes a grant, for the sons of native chiefs. The shops are chiefly in the hands of Indians and Arabs.

BAFWASENDE. Lat. 1° 07′ N., long. 27° 09′. Stanleyville province. Stanleyville district. Bafwasende sub-district.

Bafwasende is the headquarters of the sub-district, lies on the right bank of the Lindi river, and has a sub-post office, rice mills, and a dispensary of the Red Cross (Croix Rouge du Congo). A commercial centre, it is connected by road with Stanleyville and the Vicicongo railway.

BAMBILI. Lat. 3° 40′ N., long. 26° 08′. Stanleyville province. Uele district. Buta sub-district.

On the right bank of the Uele river, it contains an administrative office, a sub-post office, and a medical post of the Red Cross. In

normal times a company of cyclists of the Force Publique is stationed here. There is a small commercial quarter, an hotel (Hôtel Watteyne), and a Cotonco ginnery. Vicicongo maintains a motor transport service and a repair shop for motor vehicles. A good road connects with Titule and with Niangara. Bambili is on the edge of an extensive elephant reserve.

BANALIA. Lat. 1° 36′ N., long. 25° 21′. Stanleyville province. Stanleyville district. Banalia sub-district.

Banalia is the administrative centre of the sub-district. Lying on the left bank of the Aruwimi, about 68 miles north of Stanleyville, it is on the road from Stanleyville to Buta. It contains a sub-post office, a commercial quarter, a rice mill, a Cotonco ginnery, and a mission station of the Sacred Heart.

BANANA. *See* Chapter XI.

BANDUNDU. *See* BANNINGVILLE.

BANNINGVILLE (formerly BANDUNDU). Lat. 3° 19′ S., long. 17° 21′. Alt. 1,120 feet. Leopoldville province. Lac Leopold II district. Banningville sub-district.

Banningville is the headquarters of the sub-district. Near the confluence of the Kwango and the Kwilu, and on a motor-road to Kikwit, it contains an immigration office, government hospital, sanatorium, post office, and wireless telegraphy station. The banks are the Banque du Congo Belge and the Banque Commerciale du Congo. There is a business quarter, an hotel (Hôtel Jean Leenaerts) and a landing-ground. River steamers of Otraco and other companies call here. It is the residence of a Vicar Apostolic, and Jesuit Fathers have a mission station. Near Banningville there is a detribalized zone containing about 2,500 inhabitants.

BANZYVILLE. Lat. 4° 17′ N., long. 21° 12′. Coquilhatville province. Congo-Ubangi district. Banzyville sub-district.

Banzyville is the administrative headquarters of the sub-district. On the left bank of the Ubangi river, it contains an immigration office, custom-house, sub-post office, and a commercial quarter with stores. A Cotonco ginnery is established nearby. Banzyville is a mission station of the Capuchins. The post is on the main road to Bosobolo (105 miles) and Libenge.

BARAKA. Lat. 4° 08′ S., long. 29° 03′. Costermansville province. Kivu district. Fizi sub-district.

Baraka is a small settlement in Burton bay on the western shore of Lake Tanganyika. It contains the office and dwelling of an *Agent territorial* and two or three trading stores. There is a Cotonco ginnery nearby. A road runs south-west for 20 miles to the government station of Fizi. The normal approach to Fizi is through Baraka.

BASANKUSU. Lat. 1° 10′ N., long. 19° 41′. Coquilhatville province. Tshuapa district. Basankusu sub-district.

Basankusu is the headquarters of the sub-district. At the junction of the Lopori and Maringa rivers, with uninterrupted navigation from Stanley Pool, it contains administrative and post offices as well as a wireless telegraphy station, a small hotel, and hospitals. The banks are the Banque du Congo Belge and the Banque Commerciale du Congo. There is a large commercial quarter with stores owned by Belgian, Portuguese, and other European firms, and there are oil-palm plantations in the neighbourhood. It is the residence of a Prefect Apostolic and a station of the Mill Hill Fathers. The population of the native quarter is about 1,500. The landing-ground is on the air route Coquilhatville–Lisala. Otraco and other steamers call.

BASOKO. Lat. 1° 16′ N., long. 23° 41′. Stanleyville province. Stanleyville district. Basoko sub-district.

Basoko is the administrative headquarters of the sub-district. At the confluence of the Aruwimi and the Congo, it contains administrative and post offices, a wireless telegraphy station, a small commercial quarter, a rice mill, and a Cotonco ginnery. The Syndicat d'Études et d'Entreprises au Congo (Synkin) exploits local timbers. Otraco and other steamers call. A landing-ground lies to the east.

BASONGO. Lat. 4° 19′ S., long. 20° 28′. Lusambo province. Kasai district. Basongo sub-district.

Basongo is the administrative centre of the sub-district. On the left bank of the Kasai river, near its junction with the Sankuru, it contains administrative and sub-post offices, a commercial quarter with stores, and a cotton ginnery of the Société Textile Africaine. There are oil-palm plantations of the H.C.B. in the neighbourhood. Steamers of the Otraco, of the Société Minière du Kasai, and other vessels, call here. The small detribalized native zone has about 700 inhabitants.

BAUDOUINVILLE. *See* MOBA.

BEFALE. Lat. 0° 30′ N., long. 20° 40′. Coquilhatville province. Tshuapa district. Befale sub-district.

A small post, the headquarters of the sub-district, it contains administrative and sub-post offices.

BENI. Lat. 0° 31′ N., long. 29° 29′. Costermansville province. Kivu district. Beni sub-district.

Beni is the administrative centre of the sub-district. On the road from Kisenyi to Irumu, it contains administrative and sub-post offices, a small commercial quarter, an hotel (Hôtel du Ruwenzori), and a mission station of the Assumptionist Fathers. The Compagnie Minière des Grands Lacs Africains has mining claims in the neighbourhood. Beni is on the edge of the Parc National Albert.

BIKORO. Lat. 0° 48′ S., long. 18° 08′. Coquilhatville province. Tshuapa district. Lukolela sub-district.

On the eastern shore of Lake Tumba, it contains an administrative office, a small commercial quarter with stores, and a mission station of the Lazarist Fathers. A road connects with Coquilhatville.

BOENDE. Lat. 0° 14′ S., long. 20° 50′. Coquilhatville province. Tshuapa district. Boende sub-district.

Boende is the headquarters of Tshuapa district and of the sub-district. On the left bank of the Tshuapa river, and on the motor-road from Basankusu, it contains a post office, a wireless telegraphy station, and a commercial quarter with stores. Boende has two banks, the Banque Commerciale du Congo and the Banque du Congo Belge. Steamers of Otraco call.

BOKUNGU. Lat. 0° 31′ S., long. 22° 18′. Coquilhatville province. Tshuapa district. Bokungu sub-district.

The administrative centre of the sub-district, it has a small commercial quarter. Otraco steamers call.

BOLOBO. Lat. 2° 10′ S., long. 16° 18′. Leopoldville province. Lac Leopold II district. Mushie sub-district.

On the left bank of the Congo, it contains administrative, post, and telegraph offices, a commercial quarter, and a mission station of the Baptist Missionary Society. There is a native quarter with a

population of about 4,000. Bolobo was, for many years, the home of the missionary-explorer Grenfell.

BOMA. *See* Chapter XI.

BOMBOMA. Lat. 2° 20′ N., long. 19° 03′. Coquilhatville province. Congo-Ubangi district. Bomboma sub-district.

Bomboma is the administrative headquarters of the sub-district. On the left bank of the Bolola river and about 50 miles from Budjala, it contains a sub-post office as well as administrative offices. There are two or three trading stores.

BONDO. Lat. 3° 47′ N., long. 23° 44′. Stanleyville province. Uele district. Bondo sub-district.

The administrative centre of the sub-district, it lies on the right bank of the Uele river about 97 miles from Buta, and is the terminus of the railway from Aketi, on the Itimbiri river (Vicicongo line), via Komba junction. It contains an administrative office, a sub-post office, a native dispensary, railway workshops, a large commercial quarter with stores, and a Cotonco ginnery. The hotel is run by Vicicongo. Some mining claims in the neighbourhood are managed by the Société Coloniale Minière. There is a station of the Norwegian Baptist Mission and of the Croizier Fathers. The road from French Equatorial Africa to Buta passes through the settlement.

BONGANDANGA. Lat. 1° 25′ N., long. 21° 02′. Coquilhatville province. Tshuapa district. Bongandanga sub-district.

Bongandanga is the headquarters of the sub-district. On the left bank of the Lopori river, about 90 miles upstream from Basankusu, it contains a small commercial quarter, a station of the Congo-Balolo Mission, and, nearby, an oil-palm plantation of the Compagnie du Congo Belge. Otraco and other steamers call.

BOSOBOLO. Lat. 4° 12′ N., long. 19° 51′. Coquilhatville province. Congo-Ubangi district. Bosobolo sub-district.

Bosobolo is the administrative centre of the sub-district. It contains a sub-post office, a Cotonco ginnery, and a mission station of the Capuchins.

BUDJALA (or BUJALA). Lat. 2° 39′ N., long. 19° 50′. Coquilhatville province. Congo-Ubangi district. Budjala sub-district.

The headquarters of the sub-district, it lies on the through road

from Libenge, on the Ubangi river, to Lisala on the Congo. It ha a sub-post office, a small commercial quarter with stores, and Cotonco ginnery.

BUKAMA. *See* Chapter XI.

BUMBA. Lat. 2° 10′ N., long. 22° 31′. Alt. 1,260 feet. Coquilhatvill province. Congo-Ubangi district. Bumba sub-district.

The administrative centre of the sub-district, Bumba is a rive port on the right bank of the Congo near the confluence of th Itimbiri river, on which traffic for Aketi is carried. It has a post an telegraph office, a wireless telegraphy station, a large commercia quarter with stores, and one private hotel. The two banks are th Banque Commerciale du Congo and the Banque du Congo Belge Bumba is in a rice-growing neighbourhood and there are five ric mills. The Scheut Fathers have a mission station here. There is an emergency alighting area for seaplanes on the river i front of the station, and a landing-ground in the post. Steamer of the Otraco and other companies call at regular intervals. There are road communications with Lisala on the west and Itimbir on the east. Bumba has a detribalized native zone, the popula- tion of which is about 3,400.

BUSU DJANOA. Lat. 1° 40′ N., long. 21° 34′. Coquilhatville province Congo-Ubangi district. Busu Djanoa sub-district.

A small administrative headquarters of the sub-district. It has a sub-post office.

BUTA. Lat. 2° 47′ N., long. 24° 46′. Stanleyville province. Uele district. Buta sub-district.

Buta, at the end of a navigable stretch of the Rubi river, is the head- quarters of district and sub-district. The post is on a loop line of the Vicicongo railway. There is a post office and wireless telegraphy station. In normal times a detachment of the Force Publique was stationed here and there was also a European detachment of volun- teers. The railway workshops of Vicicongo undertake machinery repairs. The three banks are the Banque Belge d'Afrique, the Banque du Congo Belge, and the Banque Commerciale du Congo. A Cham- ber of Commerce has been formed (Chambre de Commerce des Ueles).

There is a large commercial quarter in which Belgian, Greek, and Portuguese firms have stores. Hotels are run by Messrs. Claessens and Neofitou, and also by Vicicongo, and there is a cinema. Buta is on the through road which runs south to Stanleyville and north-west to the Uele, and motor transport is available. Lime is produced in the neighbourhood, and a certain amount of mining is carried out by the Société Minière de la Bili, but the surrounding country is largely under cotton, and the settlement has a cotton ginnery. There is a large game reserve to the south of the town. Buta is the residence of a Vicar Apostolic. The Premonstratensian Fathers and the Marist Brothers have stations here. At the former is a school for the sons of chiefs; at the latter one for European children. There is a detribalized native zone with a population of about 8,700.

CHARLESVILLE. Lat. 5° 33′ S., long. 20° 57′. Lusambo province. Kasai district. Luebo sub-district.

Charlesville is the terminus of the Makumbi railway, which is 58 miles in length and is maintained by the Société Internationale Forestière et Minière du Congo (Forminière). The settlement has a post office, a wireless telegraphy station, and a small commercial quarter, chiefly used by Belgian firms. Steamers of the Kasai Company and other firms call here. It is a station of the Congo Inland Mission.

CHIKAPA. *See* TSHIKAPA.

COQUILHATVILLE. Lat. 0° 04′ N., long. 18° 20′. Alt. 1,210 feet. Coquilhatville province. Tshuapa district. Coquilhatville sub-district. (Fig. 47.)

Coquilhatville, a township on the left bank of the Congo where it is joined by the Ruki, is the administrative headquarters of both the province and the sub-district. It has a custom-house, an immigration office and registry, a post office, and a wireless telegraphy station. There are government hospitals for Europeans and natives and a medical school for training native *infirmiers*. Normally, a detachment of the Force Publique is stationed here, and there is also a European detachment of volunteers. The banks are Banque Belge d'Afrique, Banque du Congo Belge, and Banque Commerciale du Congo. There is a large commercial quarter in which Belgian, Portuguese, and Greek firms have stores, and a Chamber of Commerce has been

established. The Compagnie du Congo Belge has an hotel here. There are ice factories, garages, and a cinema. Electricity is supplied by the Société Anonyme Belge pour le Commerce du Haut-Congo (S.A.B.). The two river steamer repair yards belong to the S.A.B. and to the Société Équatoriale Congolaise Lulanga-Ikelembo (Secli)

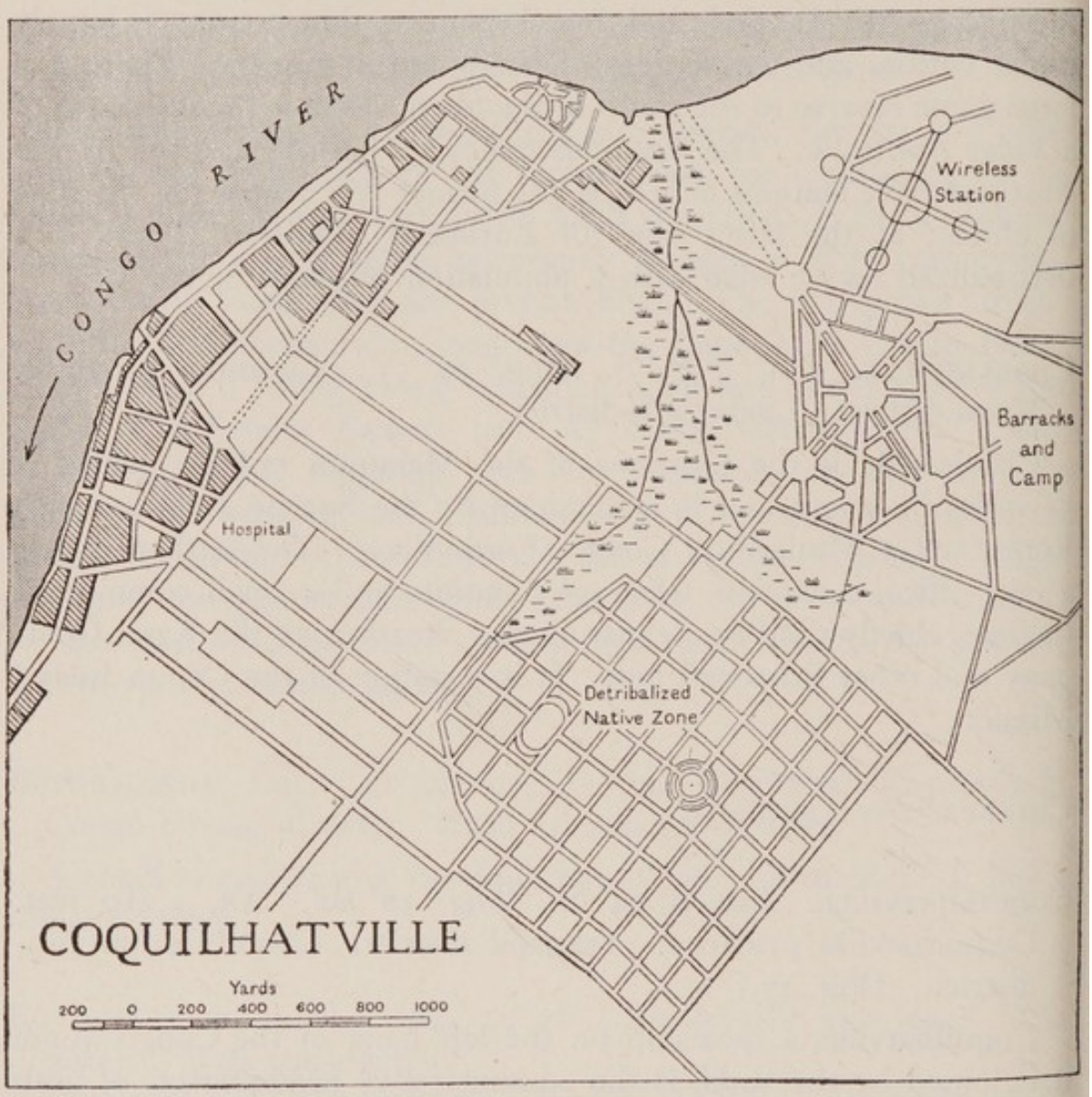


FIG. 47. *Coquilhatville*

respectively. There is an airfield nearby. Steamers of the Otraco call at regular periods, and other steamers use the port. A road runs south to Lake Tumba. Coquilhatville is the residence of a Vicar Apostolic and a station of the Fathers of the Sacred Heart. There is a school for young European children at the Convent de la Charité. The Disciples of Christ Mission (Protestant American) have a station nearby (at Bolenge). Near the town is a detribalized native zone, in

which the population of the main section is about 8,500 and of the fishing-village 1,720.

COSTERMANSVILLE. Lat. 2° 30′ S., long. 28° 50′. Costermansville province. Kivu district. Kabare sub-district. (Fig. 51.)

At the extreme south end of Lake Kivu, Costermansville is the headquarters of the province and of the district. Normally a detachment of the Force Publique is stationed here, and there is a European detachment of volunteers. It contains a custom-house, a registry office (bureau d'immatriculation), European butcheries and bakeries, a cinema, a post office, and a wireless telegraphy station. There are hospitals for Europeans and natives. The town is linked by road, and partly by a 3′ 6″ gauge railway, to Lake Tanganyika at Uvira. The banks are Banque Belge d'Afrique, Banque Commerciale du Congo, Banque du Congo Belge, and the Crédit Foncier Africain. Belgian, Greek, and Portuguese firms trade in the town and a Chamber of Commerce has been established. It contains the following hotels: Hôtel du Commerce, Hôtel du Kivu, Café du Sport, Hôtel de la Ruzizi, Hôtel des Volcans, and M. Napoléon Riva's. There is a printing press, and two journals—the *Centre Afrique* and *Echo du Kivu*—were published in 1940. Three doctors and four lawyers were in practice in the same year. Coffee plantations in the neighbourhood are maintained by Belgians and others. Several power-driven saw-mills have been set up for dealing with local timber, which is of good quality when well seasoned. Electric light is supplied by the firm Chantiers et Cultures au Kivu. Lorries and motor-cars can be hired from firms dealing particularly with transport. On Lake Kivu itself the Chemins de Fer du Kivu (Cefaki) provide water transport. There is an airfield near the town. The White Fathers have a large mission station, and a school for European children is established at the Convent de la Ste. Famille. The population of the detribalized native zone is about 2,200.

To the south-west a road leads to the Lualaba, whilst another, running north, is one of the through routes to Uganda.

DEKESE (DEKEZE). Lat. 3° 24′ S., long. 21° 26′. Lusambo province. Kasai district. Dekese sub-district.

A small administrative post, on the right bank of the Lukenie river, Dekese is the headquarters of the sub-district. It has a sub-post office and a mission station of the Fathers of the Sacred Heart. Two

or three European firms trade in local products such as palm-nuts and gums. Otraco and other steamers call from time to time.

DIBAYA. Lat. 6° 37′ S., long. 22° 56′. Lusambo province. Kasai district. Dibaya sub-district.

Dibaya, a small administrative post, is the headquarters of the sub-district. It has a sub-post office, European stores, and a Cotonco ginnery. The Société d'Elevage et de Culture au Congo Belge has undertakings in the vicinity.

DILOLO. Lat. 10° 33′ S., long. 22° 27′. Elisabethville province. Lualaba district. Malonga sub-district.

Dilolo railway station is the western terminus of the Bas-Congo–Katanga railway (B.C.K.) which continues westward as the Lobito bay railway, and is on the Lulua river boundary between Angola and Belgian Congo. The settlement is nearly 20 miles to the north-east of the railway station. There are a post and telegraph office, an hotel (Hôtel Cosmopolite), and a few European stores. Cotonco has a ginnery here. At the railway station there is a custom-house, a registry, and a garage. The Société Coloniale Minière has mining claims nearby, and a mission station of the Franciscans has been built in the neighbourhood.

DIMBELENGE. Lat. 5° 36′ S., long. 23° 03′. Lusambo province. Sankuru district. Dimbelenge sub-district.

A small administrative post which is the headquarters of the sub-district.

DJOLU. Lat. 0° 49′ N., long. 22° 30′. Coquilhatville province. Tshuapa district. Djolu sub-district.

Djolu is an administrative post on the right bank of the Bolombo and is the headquarters of the sub-district.

DJUGU (or JUGU). Lat. 1° 55′ N., long. 30° 35′. Stanleyville province. Kibali-Ituri district. Djugu sub-district.

Djugu is the headquarters of the sub-district and lies on the left bank of the Nizi about 30 miles north-east of Kilo. It contains administrative offices and a sub-post office. There are a few stores owned by Belgians, Greeks, and Indians, in the commercial quarter. There are two hotels: the Hôtel Rensonnet and Dimech's. A trade in smoke-dried fish existed at Djugu before the war.

DOLO (or NDOLO). Lat. 4° 20′ S., long. 15° 22′.

Dolo is on the south shore of Stanley Pool, 5 miles east of Leopoldville, of which place it is practically a suburb. The Matadi railway passes through it, and it contains the air-port of Leopoldville. The 'Synkin' Company has a cabinet-making factory.

DORUMA. Lat. 4° 41′ N., long. 27° 40′. Stanleyville province. Uele district. Dungu sub-district.

Through this small frontier post near the Sudan border the road runs north into the Sudan and south to Niangara and Stanleyville. A few stores have been built in the commercial quarter. Cotonco has a ginnery here, and there is a Dominican mission station.

DUNGU. Lat. 3° 40′ N., long. 28° 31′. Stanleyville province. Uele district. Dungu sub-district.

Dungu is the headquarters of the sub-district and an old-established post on the Aka, or Dungu, river which is a tributary of the Uele. It contains a sub-post office, a custom-house, and a Cotonco ginnery. European firms, mostly Greek, trade in the town. Two missions—the Africa Inland Mission and the Dominican Fathers—have stations near the place.

Dungu was an important station in the early history of the colony. It was from here that Captain Chaltin advanced into the Sudan.

ELISABETHA. Lat. 1° 08′ N., long. 23° 40′. Stanleyville province. Stanleyville district. Basoko sub-district.

The station of Elisabetha, on the left bank of the Congo near Basoko, is the centre of a large concession granted to the H.C.B. for the exploitation of the oil palm. Sedec, which is associated with the H.C.B., has a trading establishment here, and the de Montfort Fathers have built a mission station nearby.

ELISABETHVILLE. Lat. 11° 42′ S., long. 27° 32′. Alt. 4,000 feet. Elisabethville province. Haut-Katanga district. Elisabethville sub-district. (Fig. 48.)

Elisabethville is the capital of the province, the district, and the sub-district. It is the most important town after the capital, Leopoldville. It is compact and well laid out and contains the amenities demanded by Europeans living in the tropics. The size and prosperity of the town depend largely on mining. The Usines de la Lubumbashi, a



FIG. 48. *Plan of Elisabethville*

large ore-reducing plant belonging to the Union Minière du Haut-Katanga (U.M.H.K.), is in its south-west outskirts. The railway, which keeps to the east of the town, prolongs the South African railway system and connects, via Tenke junction, to the Lobito bay railway. The main line continues north as the 'B.C.K.' to Port Francqui. Elisabethville is in communication by rail or river with Leopoldville, Stanleyville, Lobito bay, Beira, and South Africa. Motorable roads come in from the south and continue north-west to Jadotville and Bukama. A road to the north-east leads to Kasenga. The airfield—the terminus of Belgium–Congo line—is some 3 miles from the town. Wireless telegraphy keeps touch with the colony and the world generally. In 1940 Great Britain, France, Greece, Norway, and Holland maintained consular officers either in Elisabethville itself or nearby.

The First Battalion of the Force Publique is normally stationed to the south of the town, which also furnishes a detachment of European volunteers.

European and native hospitals, a bacteriological laboratory, a maternity clinic, and also a dispensary, have been built. The Government maintains a medical staff, as do the railway and mining companies, but it is said that there is still room for private practice.

Three printing presses produce, between them, the *Bulletin de la Chambre de Commerce*, *L'Echo de Katanga*, *L'Echo Sportif*, *L'Essor Agricole*, *L'Essor du Congo*, *L'Informateur*, and *Le Katanga Illustré*.

The following banks have opened branches: Banque Belge d'Afrique, Banque du Congo Belge, Banque Commerciale du Congo, Crédit Agricole d'Afrique, Crédit Foncier Africain, Crédit Hypothécaire d'Afrique, Union du Crédit du Katanga. Insurance companies have also established businesses, amongst which are the Alberta, Assurances Générales de Paris, Commercial Union Assurance Co. Ltd., Compagnie Foncière du Katanga, Crédit Hypothécaire d'Afrique, Guardian Assurance Co., Charles Lejeune et Cie, Northern Assurance Co., and Société Immobilière et Hypothécaire Africaine. Lawyers, architects, dentists, and opticians practise in the town. Mining businesses include Sermikat, Simkat, Société Minière du Becéka, Société de Recherches Minières du Sud-Katanga, Tanganyika Concessions Co., and Union Minière du Haut-Katanga.

In the business quarter are general stores, ice factories, garages, boot and shoe shops, bakeries, hairdressers, tailors, ladies' outfitters, furniture and hardware, stationers, watch-makers, photographers, dairies, and tea rooms—in short the usual selection which goes to

make up a modern town. The proprietors are Belgians, Portuguese, Greeks, and South Africans for the most part. They have formed a strong Chamber of Commerce. For entertainment there are twelve hotels, three swimming-pools, and a cinema. The townspeople have founded a dozen or more social and sporting clubs.

The Roman Catholic Church is represented by a Vicar Apostolic, Salesian and Benedictine Missions, and by the Sisters of Charity. The Protestants include the Dutch Reformed Church and the Methodist Episcopal Congo Mission. There is also a synagogue. The Sisters of Charity have a state-aided school for European girls and the Salesians one, also state-aided, for boys, whilst other missions also have schools.

The population of the detribalized native zone is about 14,000. A great many native labourers pass through Elisabethville on their way to and from the mines, and there are labour camps and organizations.

There are several European farms in the neighbourhood.

ETOILE DU CONGO. Lat. 11° 39′ S., long. 27° 38′. Elisabethville province. Haut-Katanga district. Elisabethville sub-district.

On a branch line from Elisabethville, some 7 miles long, this small settlement is the site of a famous copper-mine, and there are a few European farms nearby. The Union Minière du Haut-Katanga produce a certain amount of lime locally.

FARADJE (or FARAJE). Lat. 3° 45′ N., long. 29° 39′. Stanleyville province. Kibali-Ituri district. Faradje sub-district.

Faradje is the administrative centre of the sub-district. Lying on the left bank of the Dungu river, it has an administrative office, a sub-post office, a small trading quarter, and a ginnery of the Compagnie Cotonnière du Haut-Uele et du Nil. The roads from Niangara and Mungbere to Juba in the Sudan join here, and Vicicongo runs transport to and through it. The settlement is on the edge of an elephant reserve which extends north to the Sudan border. The Dominicans have a mission station in the vicinity.

FATAKI. Lat. 1° 57′ N., long. 30° 38′. Stanleyville province. Kibali-Ituri district. Djugu sub-district.

A high and healthy mission station of the White Fathers, 8 miles from the administrative post of Djugu and about 30 miles from Lake Albert. A primary school for European boys and girls has been established at the mission.

FESHI. Lat. 6° 05′ S., long. 18° 12′. Leopoldville province. Kwango district. Feshi sub-district.

Feshi is the headquarters of the sub-district. The settlement is on the left bank of the Kwenge, has a sub-post office, and one or two European trading stores.

FIZI (FISI). Lat. 4° 20′ S., long. 28° 50′. Costermansville province. Kivu district. Fizi sub-district.

Fizi is the administrative centre of the sub-district. It is approached by road from the small port of Baraka on Burton bay, Lake Tanganyika.

GEMENA. Lat. 3° 14′ N., long. 19° 40′. Coquilhatville province. Congo-Ubangi district. Gemena sub-district.

Gemena, a small post, is the administrative centre of the sub-district and has a sub-post office and a Cotonco ginnery. Passable roads enter Gemena, from the Ubangi river on the west and the Mongala on the east. The local natives produce cotton and sell it to Cotonco.

GOMA (or NGOMA) Lat. 1° 40′ S., long 29° 08′. Costermansville province. Kivu district. Rutshuru sub-district.

A small post, on the northern shore of Lake Kivu, and in beautiful country, it lies 2 miles west of Kisenyi and 46 south of Rutshuru. It contains a post and telegraph office and two hotels, the Hôtel du Commerce and the Hôtel des Volcans. A great game reserve, the Parc National Albert, lies to the north. The post is served by the Vicicongo transport system, via Rutshuru, Lubero, and Irumu. The neighbourhood is high and healthy and is reckoned to be most suitable for European settlement. There is a landing-ground.

GOZI (or NGOZI). Lat. 2° 54′ S., long. 29° 50′. Alt. 5,900 feet. Residency of Urundi. Ngozi sub-district.

A small administrative post which is the headquarters of the sub-district. There are two or three European firms trading in the place, which is connected by road with Kitega, 55 miles to the south, and with Astrida, 37 miles to the north.

IDIOFA. Lat. 5° 0′ S., long. 19° 34′. Leopoldville province. Kwango district. Idiofa sub-district.

Idiofa is the headquarters of the sub-district. The post is on the right bank of the river Lie, a tributary of the Kasai. It possesses a

sub-post office and a few stores kept by Belgian firms. H.C.B. have an oil-palm plantation in the neighbourhood. There is a ginnery belonging to Cotonco. Roads lead to Kikwit on the west and to the Kasai river on the north.

IKELA. Lat. 1° 03′ S., long. 23° 20′. Coquilhatville province. Tshuapa district. Ikela sub-district.

Ikela is the administrative centre of the sub-district, and lies on the right bank of the Tshuapa river, in an oil-palm and coffee-producing area. Otraco steamers call at the post, which contains half a dozen general stores kept by Belgian or Portuguese firms. There is a sub-post office. Motorable roads are absent; transport is by boat or canoe.

INGENDE. Lat. 0° 10′ S., long. 18° 57′. Coquilhatville province. Tshuapa district. Ingende sub-district.

This small administrative post, on the left bank of the Rubi river, is the centre of the sub-district. Otraco and other steamers call here. A few tracks, motorable in the dry season, run from the post through the sub-district which produces rice, gum copal, and palm-nuts. Water transport is largely used.

INKISI. Lat. 5° 10′ S., long. 15°. Leopoldville province. Bas-Congo district. Inkisi sub-district.

This station on the Chemin de Fer du Congo (C.F.C., km. 264) contains administrative, post, and telegraph offices, and a custom-house. It is a small trade-centre in which some half a dozen European firms have stores. There is a small hotel, the Hôtel Fonseca. Rice is grown in the neighbourhood, and the Société Agricole de l'Inkisi has a rice mill. About one mile away is the great Jesuit mission station of Kisantu, where a Vicar Apostolic resides.

INONGO. Lat. 1° 55′ S., long. 18° 30′. Alt. 1,066 feet. Leopoldville province. Lac Leopold II district. Inongo sub-district.

An important administrative post on the eastern shore of Lake Leopold II, Inongo is the headquarters of the district and also of the sub-district. It contains a post office, wireless telegraphy station, and several European stores. The two banks are the Banque du Congo Belge and the Banque Commerciale du Congo. The area produces gums, but the principal trade is in palm-nuts. Ineac has

a rubber plantation in the neighbourhood. Otraco and other steamers call. In normal times a detachment of the Force Publique is stationed here, and there is an airfield. There is a detribalized native zone with a population of about 1,500. There are no roads and transport is by water or by air.

IREBU. Lat. 0° 40′ S., long. 17° 48′. Coquilhatville province. Tshuapa district. Lukolela sub-district.

The post is on the left bank of the Congo, at the entrance to Lake Tumba. Its importance has diminished in recent years, but gum copal is collected in the area and it is a training-camp for the Force Publique. Seven European firms have general trading stores in the settlement, and there is a sub-post office. A mission station of the Lazarist Fathers is near the town. Otraco and other steamers call regularly. Irebu depends almost entirely on water transport, for there are no all-weather roads in the neighbourhood.

IRUMU. Lat. 1° 30′ N., long. 29° 56′. Stanleyville province. Kibali-Ituri district. Irumu sub-district.

This important administrative and commercial post, on the headwaters of the Ituri river, is the capital of the district as well as of the sub-district and is at the junction of roads from Stanleyville to the west, Rutshuru to the south, and Lake Albert to the east. It contains a custom-house and registry office. Normally a company of the Force Publique and a detachment of European volunteers are stationed here. There is a post office and wireless telegraphy station. The two banks are the Banque Commerciale du Congo and the Banque du Congo Belge. There are two hotels, the Cornélis and Engelbrecht's. The commercial firms within the town are chiefly Belgian, but Portuguese and Indian traders also have stores. One or two Europeans have farms in the vicinity. Small hospitals for Europeans and natives have been established by the Government. The Vicicongo transport system serves the town, and other motor transport is available. There is an airfield nearby. Irumu is on the edge of a gold-mining area and 30–35 miles from the Kilo mines. A game reserve extends to the north and west.

ISANGI. Lat. 0° 46′ N., long. 24° 17′. Stanleyville province. Stanleyville district. Isangi sub-district.

This administrative post is the headquarters of the sub-district. It stands at the junction of the Lomami and Congo rivers and gains

any importance it may have from its geographical position. There is a sub-post office. The native population is fairly large, and Arabs, or Africans of Arab descent, will be noticed about here.

ISIRO (PAULIS). Lat. 2° 51′ N., long. 27° 42′. Stanleyville province. Uele district. Mangbetu sub-district.

Isiro (or Paulis), on the Vicicongo railway, is the administrative headquarters of the sub-district. It has a sub-post office, a Vicicongo hotel (Hôtel Mangbetu), a cinema, two cotton ginneries, and a dispensary of the Congo Red Cross. The Vicicongo railway company has large workshops here for the repair of its fleet of motor lorries and trucks, and the place is a small commercial centre for the surrounding agricultural district. A network of dry-weather roads serves the district.

JADOTVILLE. Lat. 11° 0′ S., long. 26° 44′. Elisabethville province. Lualaba district. Jadotville sub-district. (Fig. 49.)

This modern mining town, on the Bas-Congo–Katanga railway, is 80 miles by road north-west of Elisabethville. It is the headquarters of the district and sub-district. Besides the usual administrative offices, there is a custom-house and post and telegraph offices. A territorial company of the Force Publique and a detachment of European volunteers are stationed nearby. The three banks are the Banque Belge d'Afrique, the Banque du Congo Belge, and the Banque Commerciale du Congo. Two insurance companies, have offices here —the Compagnie Foncière du Katanga and the Crédit Hypothécaire d'Afrique. There are eight hotels, six garages, two ice factories, and a printing press. Shops and stores cater for European needs and there are two cinemas. Half a dozen firms specialize in selling provisions wholesale for native labour in the mines. The population of the detribalized native zone is about 3,500. A number of Europeans in the neighbourhood produce vegetables, milk, and meat for local consumption.

The Benedictines have a mission here, and the Government maintains a school for European boys managed by the Brothers of St. Francis Xavier. Girls can be educated at the Benedictine Convent. The Methodist Episcopal Mission also has a station in the vicinity.

JUGU. *See* DJUGU.

KABALO. *See* Chapter XI.

KABAMBARE. Lat. 4° 43′ S., long. 27° 42′. Costermansville province. Manyema district. Kabambare sub-district.

Headquarters of the sub-district of Kabambare. There is a sub-post office, and the settlement contains a few trading stores. The

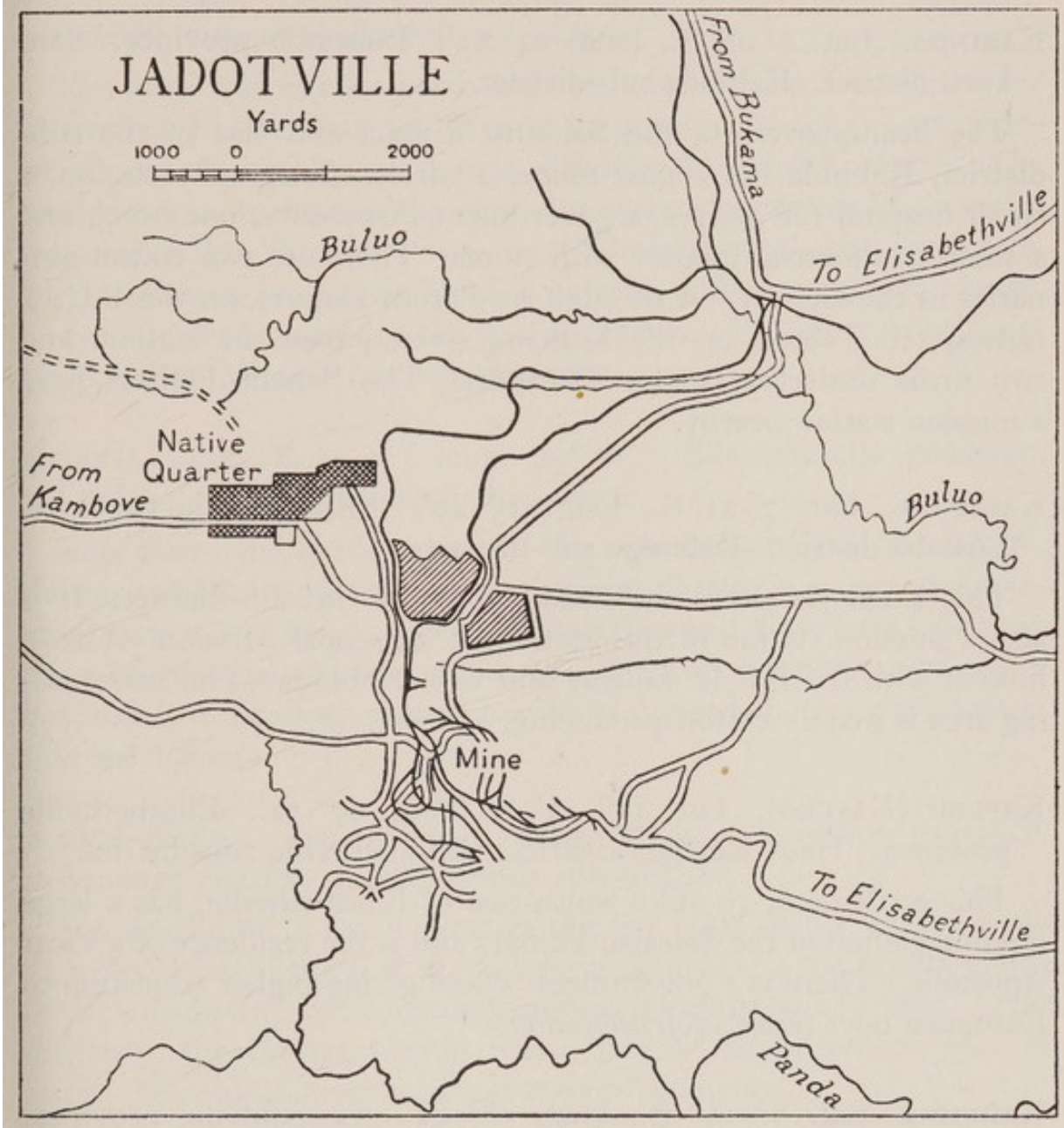


FIG. 49. *Jadotville*

Société Minière du Manyema holds some mining claims in the area. Nearby is a Cotonco ginnery. The road from Kasongo on the Lualaba to Albertville on Lake Tanganyika runs through the station.

KABARE. Lat. 2° 26′ S., long. 28° 47′. Costermansville province. Kivu district. Kabare sub-district.

This small settlement, near the capital of the province, is the head-quarters of the sub-district and lies near the south-west extremity of

Lake Kivu. It contains a sub-post office. Kabare is the centre of an agricultural district in which there are European settlers and at the White Fathers' Mission nearby there is a school for European children.

KABINDA. Lat. 6° 08′ S., long. 24° 21′. Lusambo province. Sankuru district. Kabinda sub-district.

The headquarters of the Sankuru district and also of the sub-district, Kabinda has a post office, a wireless telegraphy station, a small hospital for natives, a government dispensary, one hotel, and a small commercial quarter with stores. There are two cotton ginneries in the vicinity. A through road from Luputa, on the B.C.K. railway, to Tshofa, on the Lomami river, passes the station, and two firms undertake motor transport. The Scheut Fathers have a mission station nearby.

KABONGO. Lat. 7° 21′ S., long. 25° 40′. Elisabethville province. Lualaba district. Kabongo sub-district.

This small station is the headquarters of the sub-district. It is also a mission station of the Methodist Episcopal Mission. A road links it with the B.C.K. railway and with Kabinda. The surrounding area is mainly cotton-producing.

KAFUBU (KAFUBO). Lat. 11° 43′ S., long. 27° 31′. Elisabethville province. Haut-Katanga district. Elisabethville sub-district.

This settlement, 10 miles south-east of Elisabethville, has a large mission station of the Salesian Fathers and is the residence of a Vicar Apostolic. There is a government school giving higher education to European boys (*école professionnelle*).

KAHEMBA. Lat. 7° 19′ S., long. 18° 45′. Leopoldville province. Kwango district. Kahemba sub-district.

A small administrative post which is the headquarters of the sub-district. It contains administrative and sub-post offices, and also two or three trading stores.

KALEHE. Lat. 2° 03′ S., long. 28° 54′. Costermansville province. Kivu district. Kabare sub-district.

Kalehe, a small administrative post, about which are a dozen or

more European farms and coffee plantations, is on the west of Lake Kivu near the foot of high mountains, 132 miles by road from Rutshuru and 46 miles from Costermansville.

KAMBOVE. Lat. 10° 54′ S., long. 26° 38′. Elisabethville province. Lualaba district. Jadotville sub-district.

The town is five miles north-west of Jadotville, on a branch of the Chemin de Fer du Katanga. It owes its existence to the copper mines which are worked by the Union Minière du Haut-Katanga. The copper ore is worked on the open-cut system by means of powerful steam shovels. There are the usual administrative, post, and telegraph offices as well as an hotel, a cinema, and some general stores. There is a dispensary for the use of natives. The Methodist Episcopal Congo Mission has a station near.

KAMINA. Lat. 8° 40′ S., long. 25° 01′. Elisabethville province. Lualaba district. Kamina sub-district.

This town, the headquarters of the sub-district, is on the B.C.K. railway, and in it are railway workshops. There is a post and telegraph office, two hotels (Hôtel de Bruxelles and Hôtellerie Oddone), and a commercial quarter with stores. There are European and native hospitals. A landing-ground has been cleared to the west, alongside the railway.

KANDA-KANDA. Lat. 6° 56′ S., long. 23° 32′. Lusambo province. Sankuru district. Kanda-Kanda sub-district.

Kanda-Kanda, a small post on the left bank of the Luilo, some 15 miles north of the B.C.K. railway at Kalenda, is the headquarters of the sub-district and contains the usual administrative offices. Only one firm, the Compagnie du Kasai, had an establishment here in 1940. The sub-district is mainly cotton-producing.

KASENGA. Lat. 10° 22′ S., long. 28° 41′. Elisabethville province. Haut-Katanga district. Kasenga sub-district.

Kasenga, at the limit of navigation of the Luapula river and on the boundary of Northern Rhodesia, is the headquarters of the sub-district. Besides the administrative buildings it has a sub-post office and a custom-house. There are a few commercial firms with stores and a small hotel. The Benedictines have a mission nearby. A road runs from Kasenga south-west to Elisabethville (140 miles).

KASENYI. Lat. 1° 22′ N., long. 30° 24′. Stanleyville province. Kibali–Ituri district. Djugu sub-district.

This is a small town and port on the western shore of Lake Albert. There are a custom-house, two hotels (Castado-Vimaco and Phillippe), and about half a dozen traders' stores. A certain amount of fishing is done on the lake by Europeans for commercial purposes. A road runs from Kasenyi to Irumu and the Kilo gold-mines. There are European firms which undertake transport, and a landing-ground nearby. A medical observation post installed here is concerned mainly with sleeping-sickness.

KASONGO. Lat. 4° 29′ S., long. 26° 38′. Costermansville province. Manyema district. Kasongo sub-district.

Kasongo, the headquarters of both the district and sub-district, lies on the right bank of the Lualaba river. It contains the usual administrative and post offices. In normal times a territorial company of the Force Publique and a detachment of European volunteers are stationed here. The commercial community is partly European and partly Asiatic. The two banks are the Banque Commerciale du Congo and the Banque du Congo Belge. There is a small hotel. Some mining claims have been taken up in the vicinity, but the main activities are rice and cotton. The White Fathers have built a mission station at Old Kasongo, which was an Arab stronghold in the Arab war of the nineties. A road, 19 miles in length, connects Kasongo with Loengo railway station on the Kindu–Albertville railway, and there is also a road to Albertville.

KASONGO-LUNDA. Lat. 6° 27′ S., long. 16° 43′. Leopoldville province. Kwango district. Bayaka sub-district.

The isolated post of Kasongo-Lunda is the headquarters of the sub-district, and lies on the right bank of a navigable stretch of the Kwango river. It is connected with the roads radiating from the Kwilu river. The post is on the boundary of Angola and has a custom-house besides the usual government offices. In 1940 there were a couple of trading stores. The Jesuits have a mission nearby at Mwene Gunda.

KATAKO-KOMBE. Lat. 3° 31′ S., long. 24° 25′. Lusambo province. Sankuru district. Katako-Kombe sub-district.

The headquarters of the sub-district, Katako-Kombe has an

administrative office and a mission station of the Premonstratensian Fathers. Cotonco has a ginnery nearby. Katako-Kombe is at a road junction and is connected with Lodja on the west, the Lomami river on the east, and Lusambo on the south.

KIBOMBO. Lat. 3° 57′ S., long 25° 56′. Costermansville province. Manyema district. Kibombo sub-district.

An important railway station at km. 117 on the Kindu–Albertville railway and headquarters of the sub-district. There are the usual administrative offices and a sub-post office. The district produces rice and cotton, and Cotonco have a ginnery. There are rice mills in the neighbourhood. A mission station of the Holy Ghost Fathers is near. Roads link up with Kasongo on the east and with the Lusambo road system on the west.

KIBUNGU. Lat. 2° 09′ S., long. 30° 36′. Ruanda residency. Kibungu sub-district.

This small and isolated station is the headquarters of the sub-district. It contains a custom-house, and is connected with the Kigali road system. To the north of the station lies the great Parc National de la Kagera.

KIGALI. Lat. 1° 59′ S., long. 29° 59′. Ruanda residency. Kigali sub-district.

Kigali is the capital of Ruanda and the headquarters of the sub-district. European and Asiatic firms share the commercial quarter of this small town. The Banque Commerciale du Congo has a branch here, and there is one hotel (Hôtel du Plateau). Some tin is mined, or recovered, locally, and there are a few coffee plantations round about. The White Fathers have a mission station nearby. Kigali is connected by road with Usumbura and other administrative posts in the Residency.

KIHEMBWE. Lat. 3° 32′ S., long. 26° 35′. Costermansville province. Manyema district. Kihembwe sub-district.

This small station, lying in the forest belt, is the headquarters of the sub-district. The station has been built on the Kihembwe river, which flows into the Lualaba. Gold has been found nearby, and there is a rice mill and a ginnery belonging to Cotonco. There were no motorable roads in 1936.

KIKWIT. Lat. 5° 20′ S., long. 18° 55′. Leopoldville province. Kwango district. Moyen-Kwilu sub-district.

Kikwit is the headquarters of both the district and the sub-district. It is on the left bank of the Kwilu river just below the Archduchess Stephanie Falls, which bar further navigation from Stanley Pool. The area produces palm oil, and Leverville is about 25 miles to the north. The station has administrative offices and a wireless telegraphy station. The Jesuits have a station nearby. In the commercial quarter Belgian and Portuguese firms have trading stores. There is no bank. Otraco and other steamers call. The detribalized native zone has about 3,000 inhabitants.

KILO. Lat. 1° 50′ N., long. 30° 09′. Stanleyville province. Kibali-Ituri district. Irumu sub-district.

Kilo is a commercial centre, with half a dozen stores, about 30 miles from Irumu. The White Fathers have a mission station nearby. The two banks are the Banque du Congo Belge and the Banque Commerciale du Congo. A network of dry-weather roads spreads over the district, and a good road leads to Irumu.

KILOMINES. Lat. 1° 50′ N., long. 30° 16′. Stanleyville province. Kibali-Ituri district. Irumu sub-district.

Kilomines, 12 miles east of Kilo, is the biggest gold mine in the colony. There is a small hotel, and the White Fathers have a mission nearby.

KINDU. *See* Chapter XI.

KINSHASA. The native name for Leopoldville. *See* Chapter XI.

KIPUSHI. Lat. 11° 50′ S., long. 27° 19′. Elisabethville province. Haut-Katanga district. Elisabethville sub-district.

A mining town on the borders of Northern Rhodesia, 18 miles south-west of Elisabethville, it owes its existence to the mining activities of the Union Minière du Haut-Katanga at the Prince Leopold mine. Kipushi is served by a branch of the B.C.K. railway. There are government offices, customs, a telegraph office, one hotel (Café des Sports), and a cinema. The dozen shops and stores include a European baker and butcher. An important institution is the school for young European children which has been established by the Union Minière. The Benedictine Mission has a station at Kipushi.

KISENYI. Lat. 1° 42′ S., long. 29° 10′. Residency of Ruanda. Kisenyi sub-district.

Kisenyi, on the north-east shore of Lake Kivu, and just within the borders of the territory, is the headquarters of the sub-district. There is a small hotel run by Cimnoki, and half a dozen general stores, European or Asiatic. Kisenyi is on the motor-road from Costermansville to Rutshuru, and has a garage.

KITEGA. Lat. 3° 28′ S., long. 29° 56′. Urundi residency. Kitega sub-district.

Kitega is the capital of Urundi and the headquarters of both residency and sub-district. It contains the usual administrative offices. A medical laboratory and a veterinary station have been established. There is an hotel (Hôtel de Kitega), and a small commercial quarter with stores managed by Indians. The White Fathers have established a mission station here. Coffee plantations are being developed in the vicinity by Plantations du Ruanda-Urundi and Plantations du Katanga. It is connected by a road, 42 miles long, to the port of Usumbura on Lake Tanganyika. Roads radiate from the town to the headquarters of the various sub-districts.

KONGOLO. *See* Chapter XI.

KUTU. Lat. 2° 40′ S., long. 18° 15′. Alt. 1,175 feet. Leopoldville province. Lac Leopold II district. Kutu sub-district.

This small administrative and commercial station, on the right bank of the Fimi river, is the headquarters of the sub-district and contains government offices and a sub-post office. There are half a dozen general trading stores kept by European firms. An emergency landing-ground has been constructed to the north. Otraco and other steamers maintain a service between Kutu and Stanley Pool.

KWAMOUTH. Lat. 3° 13′ S., long. 16° 16′. Alt. 1,640 feet. Leopoldville province. Lac Leopold II district. Mushie sub-district.

This small administrative post, at the confluence of the Kasai and Congo rivers, contains a post and telegraph office and a couple of Belgian trading stores. There is a detribalized native zone with a population of about 1,000. An emergency landing-ground has been cleared near the station.

LEOPOLDVILLE. *See* Chapter XI.

LEVERVILLE. Lat. 5° 08′ S., long. 18° 49′. Leopoldville province. Kwango district. Moyen-Kwilu sub-district.

This settlement, near the confluence of the Kwenge and Kwilu, and about 26 miles north of Kikwit, is a Lever Brothers' concession, and one of their palm-oil factories. It also contains a sub-post office and a Jesuit Mission, and is served by Otraco and Huilever river transport.

LIBENGE. Lat. 3° 39′ N., long. 18° 39′. Alt. 1,280 feet. Coquilhatville province. Congo-Ubangi district. Libenge sub-district.

Libenge is the headquarters of the sub-district. Lying on the left bank of the Ubangi river, it contains a custom-house, a wireless telegraphy station, and two government hospitals. The two banks are Banque du Congo Belge and Banque Commerciale du Congo. There are a few general trading stores, and the Capuchins have a mission station nearby. The natives of the district produce cotton, which is treated in a Cotonco ginnery. The detribalized zone has about 2,500 inhabitants. Otraco and other steamers call. An airfield has been cleared within the station. Libenge is on the through road from French Equatorial Africa to Lisala.

LIBUTU. *See* LUBUTU.

LIKASI. *See* JADOTVILLE.

LISALA. Lat. 2° 09′ N., long. 21° 35′. Alt. 1,246 feet. Coquilhatville province. Congo-Ubangi district. Lisala sub-district.

Lisala, the headquarters of both a district and a sub-district, contains a post office, a custom-house, and state hospitals for Europeans and natives. It is also a commercial centre in which Belgian and Portuguese firms have stores. There are two banks, the Banque du Congo Belge and the Banque Commerciale du Congo. The Scheut Fathers have a mission at Lisala and the Baptist Missionary Society a station nearby (Bopoto). A motorable road from Libenge on the Ubangi joins the Congo river at Lisala and continues eastwards to the Itimbiri river. There is an airfield, and Otraco and other steamers call *en route* to Stanleyville and Stanley Falls. There are about 1,500 natives in the detribalized zone.

LODJA (LOJA). Lat. 3° 39′ S., long. 23° 35′. Lusambo province. Sankuru district. Lodja sub-district.

The headquarters of the sub-district, Lodja is on the right bank

of the Lukenie river and marks the limit of navigation from Stanley Pool. It contains government offices, including a post office. There is a small commercial quarter in which six or seven European firms have trading stores. The Passionist Fathers have a mission station nearby. The district is agricultural, and oil-palm and coffee plantations are being developed by Europeans. Some motor transport is available. Roads from Lodja run south-west to the Sankuru, eastwards, through Katako-Kombe, to the Lomami, and north to Lomela.

LOMELA. Lat. 2° 20′ S., long. 23° 15′. Lusambo province. Sankuru district. Lomela sub-district.

Lomela, a small post in a cotton-growing district on the right bank of the Lomela river, is the headquarters of the sub-district, with government offices and a sub-post office. There are three ginneries in the neighbourhood and two or three trading stores. Otraco and other steamers call at Lomela, which has been built at the limit of navigation. A road runs south to Lodja.

LUBERO. Lat. 0° 10′ S., long. 29° 14′. Costermansville province. Kivu district. Lubero sub-district.

This small administrative station, on the Lubero river, is the headquarters of the sub-district. The government buildings include a sub-post office. There is an hotel (Hôtel des Touristes) nearby, and a mission station of the Assumptionist Fathers. The road from Rutshuru to Irumu passes through the station, in which there are two or three European trading stores.

LUBUTU (or LIBUTU). Lat. 0° 47′ S., long. 26° 37′. Stanleyville province. Stanleyville district. Lubutu sub-district.

The small post, on the right bank of the river Lubilanga, is the headquarters of a forest-clad sub-district. It has a sub-post office and a small commercial quarter containing a few European trading stores. Lubutu is a mission station of the Evangelization Society Africa Mission (American Protestant) and of the Fathers of the Sacred Heart. A road connects Lubutu with Kirundu on the Lualaba river (80 miles).

LUEBO. Lat. 5° 21′ S., long. 21° 20′. Alt. 1,490 feet. Lusambo province. Kasai district. Luebo sub-district.

This important post is the headquarters of the district as well as

of the sub-district. It lies on the Lulua river, at the confluence of the Luebo, and at the limit of steamer navigation from Stanley Pool. It contains administrative and post offices and government and missionary hospitals. There is a commercial quarter in which some eight or nine firms have trading stores. There are two banks, the Banque du Congo Belge and the Banque Commerciale du Congo. The Scheut Fathers and the American Presbyterian Congo Mission have stations nearby. A cotton ginnery has been erected by Cotonco. There is a landing-ground at the post. A road ran north from Luebo to Mweka on the B.C.K. railway in 1935, but a part of it may have been abandoned. A network of earth roads links the surrounding district with Luebo.

LUENA. Lat. 9° 15′ S., long. 25° 50′. Elisabethville province. Lualaba district. Bukama sub-district.

The small post of Luena on the Bas-Congo–Katanga railway contains government buildings and a post and telegraph office. An *Agent territorial* is stationed here. A few trading stores and a firm of contractors completed the European portion of the post in 1940.

This coal-mining area is exploited by the Union Minière du Haut-Katanga and the Charbonnages de la Luena. Much of the coal is used by the Union Minière in treating tin.

LUISA. Lat. 7° 19′ S., long. 22° 32′. Lusambo province. Kasai district. Luisa sub-district.

This small station, on the left bank of a reach of the Lulua river, is the headquarters of the sub-district. It contains a sub-post office. There are two cotton ginneries in the locality, and two European firms trade in the post. Luisa is connected by road with the B.C.K. railway at Kaulu.

LUKOLELA. Lat. 1° 06′ S., long. 17° 13′. Coquilhatville province. Tshuapa district. Lukolela sub-district.

Lukolela, on the left bank of the Congo river, is the headquarters of the sub-district. It lies on the edge of the great Congo forest, and timber is worked at the local saw-mills. It contains a post and telegraph office and a small commercial quarter. There is also a Cotonco ginnery. Mission stations of the Baptist Missionary Society and Lazarist Fathers are nearby. There are no motor-roads about Lukolela.

LULUABOURG. Lat. 5° 56′ S., long. 22° 18′. Alt. 2,066 feet. Lusambo province. Kasai district. Luluabourg sub-district.

Luluabourg is the headquarters of the sub-district and a commercial centre, 6 miles east of the Lulua river and on the B.C.K. railway. It contains a post office, a telegraph office, an hotel (Hôtel des Aviateurs), a cinema, and European stores. A landing-ground has been cleared, and there is a military camp. Cotton ginneries have been established in the neighbourhood. At the station on the B.C.K. railway there are large railway workshops. At Luluabourg Saint-Joseph, 6 miles from the post, there is a mission of the Scheut Fathers and the residence of a Vicar Apostolic. A net-work of earth roads radiate from the settlement.

LULUABOURG SAINT-JOSEPH. *See* LULUABOURG.

LUSAMBO. Lat. 4° 59′ S., long. 23° 23′. Alt. 1,620 feet. Lusambo province. Sankuru district. Lusambo sub-district. (Fig. 50.)

This is the headquarters of the province and the sub-district. It lies on the right bank of the Sankuru. Besides the usual government offices it contains a post office, a wireless station, government hospitals, a pharmacy, and a European school for young boys and girls. The banks are Banque Belge d'Afrique, Banque du Congo Belge, and Banque Commerciale du Congo. There are two hotels and a cinema. In the well-laid-out commercial quarter there are European trading stores. In the neighbourhood there are a cotton ginnery, a palm-oil factory, and rice mills. A mission station of the Scheut Fathers has been built nearby. Otraco and other steamers call at regular intervals. Roads radiate from Lusambo to various posts and motor transport is available. A landing-ground lies between the European and native towns. The detribalized native zone has about 6,000 inhabitants.

MADIMBA. Lat. 4° 58′ S., long. 15° 13′. Leopoldville province. Bas-Congo district. Inkisi sub-district.

Madimba, the headquarters of the sub-district, is an administrative and commercial post on the Matadi–Leopoldville railway (km. 266). It contains a post and telegraph office. The road from Thysville to Leopoldville passes through the town, in which a few Belgian and Portuguese firms have trading stores.

MAHAGI. Lat. 2° 17′ N., long. 31° 00′. Stanleyville province. Kibali–Ituri district. Mahagi sub-district.

Mahagi, the administrative centre of the sub-district, contains administrative, customs, and post offices. There are a few Asiatic trading stores. The Kilo-Moto mining company have interests in the neighbourhood, where there are also a few plantations.

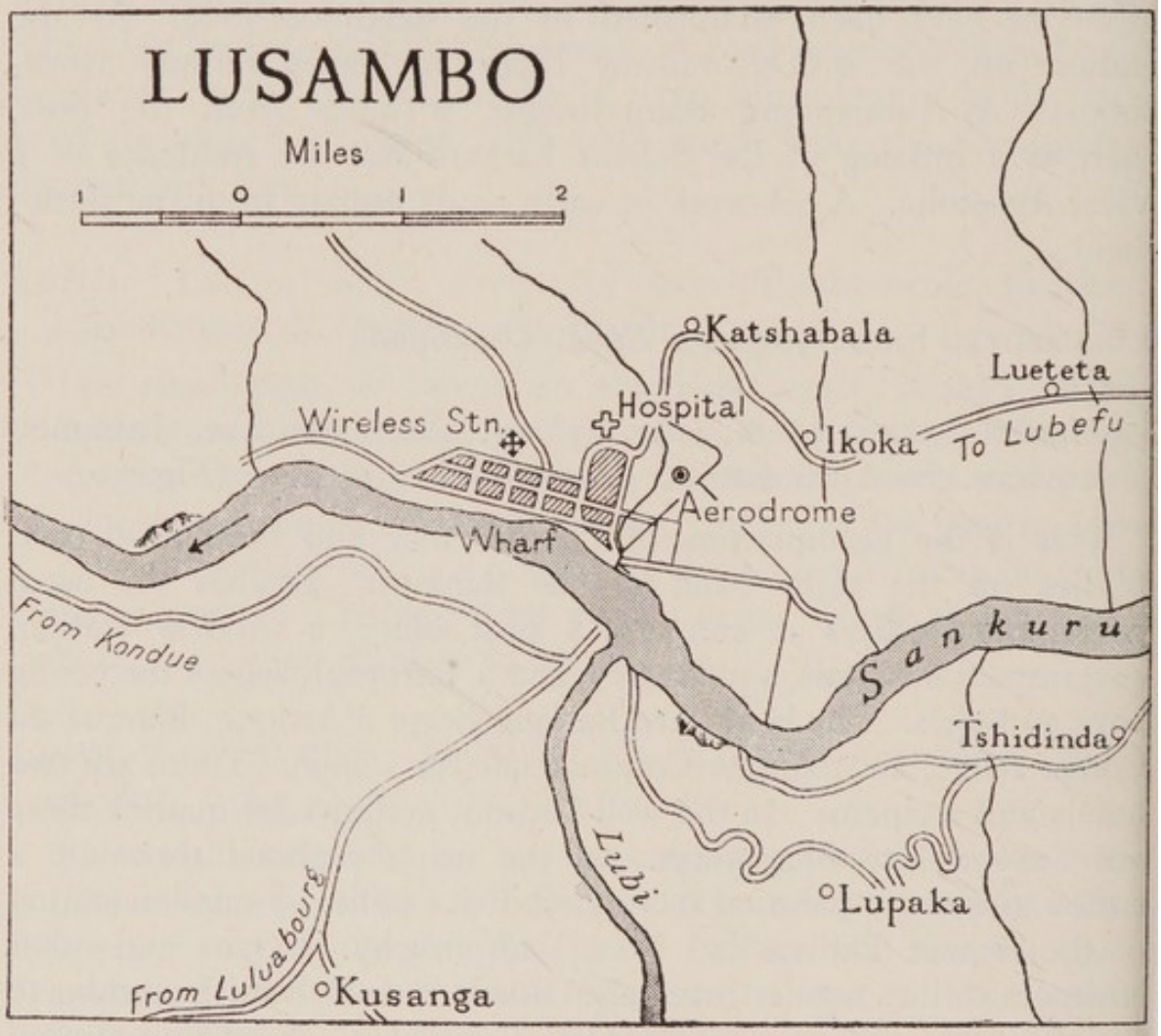


FIG. 50. *Lusambo.*

MAHAGI PORT. Lat. 2° 07′, long. 31° 12′. Stanleyville province. Kibali–Ituri district. Mahagi sub-district.

Mahagi Port, 22 miles south-east of Mahagi, lies on the north-west shore of Lake Albert.

MALONGA. Lat. 10° 38′ S., long. 23° 29′. Elisabethville province. Lualaba district. Malonga sub-district.

This small administrative post, on the Tenke–Dilolo railway,

66 miles from Dilolo, is the headquarters of the sub-district. It has a sub-post office.

MANONO. Lat. 7° 10′ S., long. 27° 16′. Alt. 1,970 feet. Elisabethville province. Tanganika district. Ankoro sub-district.

This is a commercial centre at which there is an administrative office. There are tin mines in the neighbourbood. At the Manono-Kitotolo mines Géomines have electric furnaces to reduce tin ore. Manono is connected by railway and road with Mayumba on the Lualaba. There is a post and telegraph office. A landing-ground has been constructed. Some motor transport is available.

MASI-MANIMBA. Lat. 4° 56′ S., long. 18° 01′. Leopoldville province. Kwango district. Lukula sub-district.

This administrative post and headquarters of the sub-district has no commercial quarter. It is connected with the Wamba and Kwilu rivers by a road which is linked with a system of dry-weather roads in the Kwango district.

MASISI. Lat. 1° 25′ S., long. 28° 31′. Alt. 5,000 feet. Costermansville province. Kivu district. Masisi sub-district.

This small administrative and commercial post, on the western slopes of the Kivu mountains, is the headquarters of the sub-district, and has a sub-post office. There are a few European farms and coffee plantations in the neighbourhood. The Swedish Free Church has a mission at Masisi, which is connected with Kisenyi by road.

MATADI. *See* Chapter XI.

MAWA. Lat. 2° 50′ N., long. 26° 33′. Stanleyville Province. Uele district. Poko sub-district.

Mawa is on the Makongo river, 36 miles south-west of Poko. It contains a dispensary of the Congo Red Cross, a couple of trading stores, and a Cotonco ginnery. The station on the Vicicongo railway at km. 434 from Aketi is 12 miles south of the post.

MOBA. Lat. 7° 04′ S., long. 29° 43′. Elisabethville province. Tanganika district. Moba sub-district.

A small administrative and commercial post on the western shore of Lake Tanganyika, Moba is the headquarters of the sub-district. There are a couple of European firms trading here, and a sub-post

office. The White Fathers great mission station of Baudouinville is 3 or 4 miles west of Moba.

MONKOTO. Lat. 1° 34′ S., long. 20° 41′. Coquilhatville province. Tshuapa district. Monkoto sub-district.

A small administrative and commercial post, on the right bank of the Luilake river, Monkoto is the headquarters of a large sub-district. It has a sub-post office. The Congo Rubber Estates (a Belgian company) have rubber and coffee plantations in the neighbourhood.

MUSHIE. Lat. 3° 01′ S., long. 16° 52′. Leopoldville province. Lac Leopold II district. Mushie sub-district.

Mushie, a small administrative and commercial post on the right bank of the Kwa near the confluence of the Fimi and Kasai rivers, is the headquarters of the sub-district, and has post and telegraph offices. The district is agricultural, but also produces gums and hardwood timbers. The detribalized native zone has some 2,000 inhabitants.

MWANZA. Lat. 7° 53′ S., long. 26° 42′. Elisabethville province. Tanganika district. Mwanza sub-district.

Mwanza, a small administrative post, is the headquarters of the sub-district. It lies in the heart of an extensive elephant reserve and is connected by road with the Lualaba river. The Congo Evangelistic Mission have a station near.

MWEKA (MUEKA). Lat. 4° 49′ S., long. 21° 34′. Lusambo province. Kasai district. Bakuba sub-district.

Mweka, the administrative headquarters of the sub-district, and a commercial post on the B.C.K. railway, 105 miles from Port Francqui, contains a post and telegraph office, and one hotel. A few Portuguese and Belgian firms have trading stores in the commercial quarter. There is a cotton ginnery in the neighbourhood (Société Textile Africaine). Roads run south to Luebo (45 miles), east to Port Francqui, and west to Luluabourg.

N'DOLO. *See* DOLO.

N'GOMA. *See* GOMA.

NGOZI. *See* GOZI.

NIANGARA. Lat. 3° 35′ N., long. 27° 59′. Stanleyville province. Uele district. Niangara sub-district.

Niangara, the headquarters of the sub-district, is an important administrative and commercial centre on the upper Uele river. It contains a post office, a wireless telegraphy station, one hotel, and half a dozen European stores. The two banks are the Banque du Congo Belge and the Banque Commerciale du Congo. Gold is produced along the river banks to the west of the town (Société Minière de Surongo). Cotonco has a ginnery, and coffee is cultivated nearby. Niangara is a mission station of the Dominicans and the residence of a Vicar Apostolic. It is also a station of the Heart of Africa Mission (English Protestant). A network of dry-weather roads spreads over the area. A through road from Buta to Juba, in the Anglo-Egyptian Sudan, passes through the post. A road from Stanleyville and Bafwasende also passes through, and continues north to Doruma.

NOUVELLE ANVERS. Lat. 1° 38′ N., long. 19° 09′. Coquilhatville province. Congo-Ubangi district. Nouvelle Anvers sub-district.

Nouvelle Anvers, the headquarters of the sub-district, is built on the steep cut right bank of the Congo river. The hinterland, forest-covered and liable to floods, abounds in mosquitoes. The importance of Nouvelle Anvers has lessened somewhat since navigation has improved on the river, for a few years ago the larger steamers did not venture much farther upstream. The Scheut Fathers have a mission station nearby. Commerce is represented by a local soap industry, the export of palm nuts, and a few Belgian and Portuguese firms.

NYANGWE. Lat. 4° 10′ S., long. 26° 11′. Costermansville province. Manyema district. Kasongo sub-district.

On the Lualaba river, this is a small commercial centre in an agricultural area. Originally it was an important Arab settlement and slave mart. It was first visited by Livingstone in 1871. From Nyangwe Stanley set out in 1876 on the journey which eventually revealed the course of the Congo. The area produces rice.

NYANZA. Lat. 4° 18′ S., long. 29° 38′. Residency of Ruanda. Nyanza sub-district.

This small administrative station lies on the shore of Lake

Tanganyika and is the headquarters of the sub-district. There are a few trading stores.

OPALA. Lat. 0° 54′ S., long. 24° 29′. Stanleyville province. Stanleyville district. Opala sub-district.

Opala, the administrative headquarters of the sub-district, is on the left bank of the Lomami river. The commercial centre is very small. There is a sub-post office. The district produces palm nuts and some gum copal.

OSHWE. Lat. 3° 16′ S., long. 19° 38′. Leopoldville province. Lac Leopold II district. Oshwe sub-district.

Oshwe, the headquarters of a large sub-district, is a small administrative and commercial post standing on the left bank of the Lukenie river. The area is mainly devoted to cotton growing. There are no roads. Water transport is used.

PANDA. (Not on map; *see* JADOTVILLE.)

The 'Usines de Panda' are on the southern outskirts of Jadotville, and contain a great copper-smelting plant operated by the Union Minière du Haut-Katanga.

PAULIS. *See* ISIRO.

POKO. Lat. 3° 08′ N., long. 26° 50′. Stanleyville province. Uele district. Poko sub-district.

Poko, the headquarters of the sub-district, is an administrative and commercial post on the left bank of the Bomokandi river and has a sub-post office. The few trading stores in the commercial quarter are kept by Belgian, Portuguese, and Greek firms. Cotonco has a cotton ginnery in the neighbourhood, and Forminière has gold-mining claims nearby. A station of the Heart of Africa Mission has been built here. A road, 36 miles long, joins Poko with Mawa on the Vicicongo railway.

PONTHIERVILLE. *See* Chapter XI.

PORT CHALTIN. *See* AKETI.

PORT FRANCQUI. *See* Chapter XI.

PWETO. Lat. 8° 28′ S., long. 28° 52′. Elisabethville province. Haut-Katanga district. Kasenga sub-district.

This small post lies on the right bank of the Luvua river where it issues from Lake Mweru. It contains a few government offices, two or three small stores, and is connected by a dry-season road with Sampwe. It is a port of call for shipping on Lake Mweru.

RUHENGERI. Lat. 1° 30′ S., long. 29° 33′. Ruanda residency. Ruhengeri sub-district.

Ruhengeri, an administrative and commercial post in the north of Ruanda with magnificent mountain scenery round about, is the headquarters of the sub-district, which includes part of the Parc National Albert. There are some European coffee plantations in the neighbourhood. The stores in the small commercial quarter are owned by Indians or Arabs. Roads connect Ruhengeri with Kisenyi and with Kigali.

RUTANA. Lat. 3° 58′ S., long. 30° 0′. Residency of Urundi. Rutana sub-district.

This post, the headquarters of the sub-district, contains little in the way of European settlement save a few government buildings. It is connected by road with Kitega.

RUTSHURU. Lat. 1° 10′ S., long. 29° 25′. Alt. 4,220 feet. Costermansville province. Kivu district. Rutshuru sub-district.

The headquarters of the sub-district, Rutshuru is a small post 34 miles north of Lake Kivu, set in the midst of magnificent scenery on the borders of the Parc National Albert. There are government offices, including a custom-house and post office, a small commercial quarter, and one hotel (Hôtel du Parc). Motor transport is maintained for, and by, Europeans. In the business quarter there are five or six European stores and a general contractor. In the surrounding district are European farms and plantations. An emergency landing-ground for aircraft has been levelled in the neighbourhood. Roads connect Rutshuru with Goma in the south, Uganda in the east, and Irumu in the north.

SAKANIA. Lat. 12° 44′ S., long. 28° 34′. Elisabethville province. Haut-Katanga district. Elisabethville sub-district.

Sakania is a small station on the railway between Elisabethville and Northern Rhodesia. Its importance is due to its geographical position

on the frontier at the point where the South African railway system connects with that of the Congo. There is a custom-house and an immigration office as well as a small hotel-restaurant (Grand Hôtel). The Salesian Fathers have a mission station nearby.

SAMPWE. Lat. 9° 21′ S., long. 27° 20′. Elisabethville province. Haut-Katanga district. Sampwe sub-district.

Sampwe, the headquarters of a large sub-district, a great part of which has been declared a game reserve, is a small administrative post at the base of the Kundelungu mountains. It contains government buildings, a sub-post office, and a small hotel. It is connected by road with the B.C.K. at Jadotville and with Pweto on Lake Mwero. There is a Benedictine mission station nearby.

SANDOA. Lat. 9° 39′ S., long. 22° 44′. Elisabethville province. Lualaba district. Sandoa sub-district.

Sandoa, the headquarters of a large sub-district, is an administrative centre on the right bank of the upper Lulua river. The western boundary of the sub-district marches with Angola. The government buildings include administrative and post offices, a custom-house, and a pharmacy. There is also a small native hospital. The small commercial quarter includes two banks, the Banque du Congo Belge and the Banque Commerciale du Congo. The Franciscans and the Methodist Episcopal Mission have stations nearby. A certain amount of coffee is grown round about, but in the greater part of the district natives produce cotton. The station is connected with Dilolo by road, whilst other dry-weather roads radiate from the place.

SANKISHIA. Lat. 9° 20′ S., long. 25° 50′. Elisabethville province. Lualaba district. Bukama sub-district.

There are railway workshops of the Bas-Congo–Katanga railway at Sankishia. The trading firms are mostly Greek. Coal is mined in the neighbourhood (Charbonnages de la Luena; *see* Luena).

SHABUNDA. Lat. 2° 45′ S., long. 27° 21′. Alt. 2,460 feet. Costermansville province. Kivu district. Shabunda sub-district.

Shabunda is the headquarters of a large sub-district. It has but a small commercial quarter. There is a cotton ginnery nearby (Société Textile Africaine). The Evangelization Society African Mission (American Protestant) has a station in the neighbourhood. A motorable road runs from Shabunda to Kindu on the Lualaba river (168 miles).

SHANGUGU. Lat. 2° 25′ S., long. 28° 52′. Residency of Ruanda. Shangugu sub-district. (Fig. 51.)

Shangugu is the headquarters of the sub-district. It is an administrative and commercial post at the south-east of Lake Kivu, opposite Costermansville and on the Ruzizi river, the boundary between the

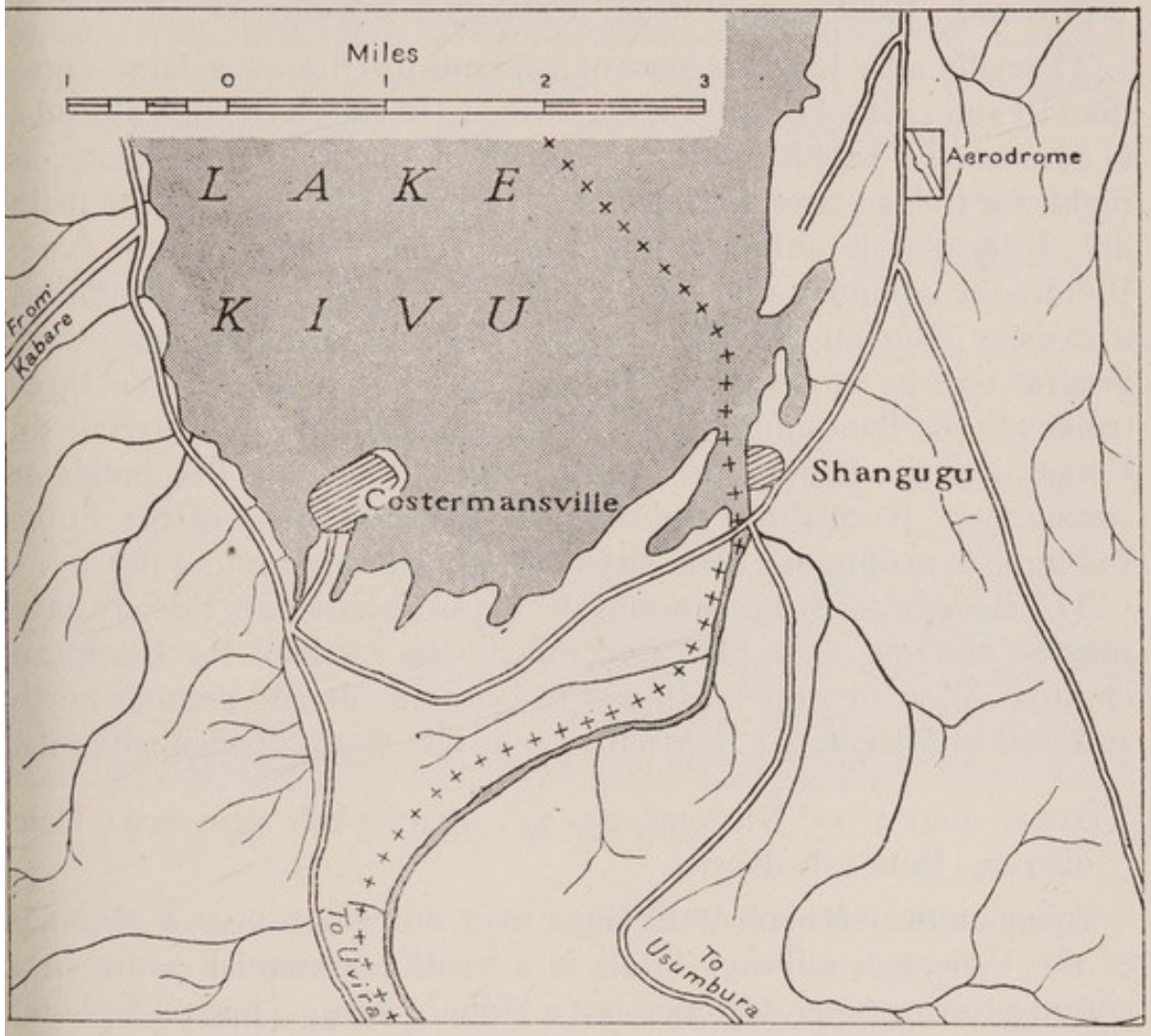


FIG. 51. *Shangugu.*

Belgian Congo and the mandated territory. It contains a custom-house. In the commercial quarter there are nine or ten trading stores, chiefly in the hands of Indians and Arabs.

STANLEYVILLE. *See* Chapter XI.

TENKE. Lat. 10° 34′ S., long. 26° 09′. Elisabethville province. Lualaba district. Jadotville sub-district.

Tenke is an important railway junction, for here the branch line from Dilolo, and consequently the Lobito bay railway, connect to the

main line. North-westwards this main line runs to Port Francqui, and southwards to Elisabethville and the Rhodesias. There is a post and telegraph office, and three hotels. Roads run north to Bukama, east to Jadotville, and west towards Dilolo.

THYSVILLE. Lat. 5° 17′ S., long. 14° 54′. Alt. 741 feet. Leopoldville province. Bas-Congo district. Cataractes sub-district.

Thysville, the headquarters of the sub-district, is a large commercial and railway centre which, owing to its relatively high altitude, is accounted a health resort. Originally it was the halting-place, at night, for trains between Matadi and Leopoldville, but now the main line by-passes it although the heavy repair shops remain here. Besides the administrative offices there are post and telegraph offices, a registry (Bureau d'immatriculation), a custom-house, and some general trading stores, both Belgian and Portuguese. The three banks are the Banque Belge d'Afrique, the Banque Commerciale du Congo, and the Banque du Congo Belge. There are five hotels or restaurants. Normally a training school for N.C.O.s of the Force Publique is maintained here, and there is a landing-ground nearby.

The Redemptorist Fathers and the Baptist Missionary Society have mission stations. The railway company has a school for European children. A road runs north-east to Leopoldville and another north and west to Manyanga. The native zone has about 3,000 inhabitants.

TITULE. Lat. 3° 15′ N., long. 25° 33′. Stanleyville province. Uele district. Buta sub-district.

Lying on the left bank of the Bima river, at the terminus of a branch of the Vicicongo railway, Titule is a small commercial centre in a cotton-growing area. Cotonco has a ginnery here. There is an hotel (Hôtel Babua) run by Vicicongo. A motor-road, which reaches Titule from Stanleyville and Buta, branches north to French Equatorial Africa and east to Niangara and the Sudan.

TSHELA. Lat. 4° 57′ S., long. 13° 0′. Leopoldville province. Bas-Congo district. Mayumbe sub-district.

Tshela is the headquarters of the sub-district and is an administrative and commercial post at the terminus of the Boma-Mayumbe railway (km. 140). It contains a post and telegraph office, an hotel, and about a dozen stores, mainly Portuguese. The sub-district produces palm oil and some timber. A motor-road connects Tshela with the Congo river opposite Matadi, with Banana, and with Boma.

TSHIKAPA (CHIKAPA). Lat. 6° 28′ S., long. 20° 46′. Lusambo province. Kasai district. Tshikapa sub-district.

Tshikapa is the headquarters of the sub-district. Near the confluence of the Tshikapa river and the Kasai it is the centre of the diamond fields of the district. It contains a post-office, a wireless telegraphy station, a registry (immatriculation), and a custom-house. The Forminière have interests in the neighbouring diamond mines and maintain a hospital here. Motor-roads lead to Charlesville, Luebo, and Lulua-Gare. There is also a landing ground.

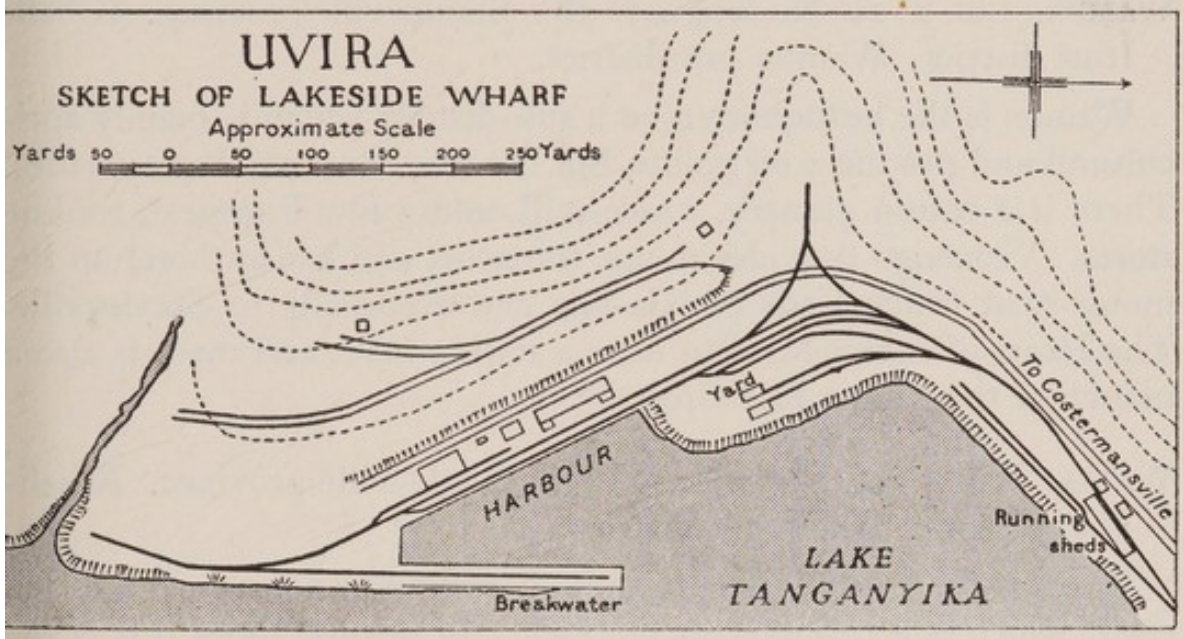


FIG. 52. *Uvira.*

TSHOFA. Lat. 5° 14′ S., long. 25° 13′. Lusambo province. Sankuru district. Tshofa sub-district.

Tshofa, a small administrative post, is the headquarters of the sub-district. The station is on a navigable reach of the Lomami river and on a motor-road from Lusambo to Kongolo. The natives of the sub-district produce cotton, and there is a Cotonco ginnery nearby.

USUMBURA. *See* Chapter XI.

UVIRA. Lat. 3° 24′ S., long. 29° 08′. Costermansville province. Kivu district. Uvira sub-district. (Fig. 52).

Uvira, the headquarters of the sub-district, is a minor port and an administrative post on the extreme north-west corner of Lake Tanganyika. The 'Cefaki' railway runs north to Kamaniola. Government offices include posts, telegraphs, and customs. Uvira exports

coffee, native grains, cotton, and hides, by the regular lake steamer service to Albertville, Usumbura, and Kigoma. The large commercial quarter contains shops and trading stores owned by both European and Asiatic firms. There are three hotels—Central, du Lac, and Wurfel—and an ice factory. A ginnery, lime-kilns, brickyards, and general contracting businesses are also in the hands of European firms. Uvira has mission stations of the White Fathers and of the Swedish Free Church. A motor-road runs parallel with the railway and continues to Costermansville. Another road leads to Usumbura.

WAMBA. Lat. 2° 10′ N., long. 27° 58′. Stanleyville province. Kibali-Ituri district. Wamba sub-district.

Wamba is the headquarters of a sub-district which is mainly agricultural and produces oil palms, but has also some mining activities. There is a cotton ginnery, a rice-mill, and a few European trading stores. Vicicongo provides motor transport and has an hotel on the motor-road which leads to Nia-Nia and eventually to Stanleyville. The Heart of Africa Mission have a station here, and there is also a branch of the Congo Red Cross.

WATSA. Lat. 3° 02′ N., long. 29° 31′. Stanleyville province. Kibali-Ituri district. Watsa sub-district.

Watsa is the headquarters of the sub-district and lies on the Kibali river, which is a tributary of the Uele. In normal times this is the headquarters of the 3rd Brigade of the Force Publique. It contains a few stores and shops. Vicicongo, which undertakes road transport to the post, keeps an hotel (Hôtel Monvu). There is gold mining at Moto, 40 miles to the west. A mission station of the Dominicans is nearby.

YAHUMA. Lat. 1° 10′ N., long. 23° 13′. Stanleyville province. Stanleyville district. Yahuma sub-district.

Yahuma, a small administrative station, is the headquarters of the sub-district. It has a sub-post office.

YANGAMBI. Lat. 0° 48′ N., long. 24° 35′. Stanleyville province. Stanleyville district. Isangi sub-district.

A large experimental agricultural plantation maintained by the Institut National pour l'Étude Agronomique du Congo Belge. An emergency landing ground lies to the east of the native village, on the river bank.

ZOBIA. Lat. 2° 57′ N., long. 25° 58′. Stanleyville province. Uele district. Poko sub-district.

This small commercial centre is on the right bank of the Bima, and on the Vicicongo railway, 203 miles from Aketi. It has a cotton ginnery. At the mission station of the Premonstratensian Fathers there is a primary school for natives and also one for more advanced education.

CHAPTER XI

PORTS

BELGIAN CONGO, almost wholly inland, touches the sea on the northern shore of the Congo estuary. Its only seaports are a pilot station at the entrance and a town at the head of the tidal water. Sea-going vessels can ascend the river for 30 miles more to the main entrepôt, but this is the last of the maritime ports and further passage is blocked by rapids.

Above the rapids navigation commences afresh. Propeller gives place to stern-wheel; and flat-bottomed steamers and tugs, towing trains of barges, ply up and down the Congo for 1,000 miles without interruption, as well as on its tributaries. Higher up still, the main river is navigable between certain points. All this river traffic entails provision of quays, warehouses, and other facilities, and so there has arisen a series of river ports.

On the eastern frontier lies the chain of great lakes and especially Lake Tanganyika, profound in depth and at times so stormy as to disturb even the veteran traveller. The navigation of these inland seas calls for deep-water craft, and the running of these services has created lake ports.

Such is the range of ports in the Belgian Congo.

I. MARITIME PORTS

1. BANANA

Lat. 6° 01′ S., long. 12° 24′. Hotel. Hospital.

SITE

The Atlantic coast of Belgian Congo terminates in a spit, 2½ miles long, one-third of a mile wide at its base, tapering to 50 yards near its tip, and so low that the spray flies across it. This spit, protected from scour and erosion by piles and masonry, projects southward across a third of the channel. There is shoal water on the western or seaward side and a drying bank to the south, but on the east is a creek sheltered from all winds, with piers and good anchorage, and this forms the harbour. The width of the entrance is half a mile, and of the channel through the bar 200 yards. Inside is a basin 4 miles long and from half a mile to a mile wide, containing a series of banks.

From the head of this basin a backwater, 200–300 yards in width, runs inland for 11 miles and also connects with Pirates' creek and with the main river higher up. The mainland, at the head of the spit, is difficult to penetrate, owing to swamps and bush. Banana is easiest to reach by water. There are, however, roads to Cabinda, Boma, Tshela, and Matadi.

History

The name is said to have been given by the Dutch. A less likely spot for a plantation it would be hard to imagine. Rings to which slaves were tethered and dumps of shell ballast, from America, are relics of the slave trade. Most of the slave-traders were Spanish, but there were some Portuguese and Dutch. The slave trade continued openly until about 1836 and surreptitiously until 1839, when British men-of-war began to patrol the mouth of the river and capture slavers. In 1859 the British captured a vessel containing 874 slaves: the last capture occurred in 1868. French Point commemorates Daumas, Beraud et Cie, who set up here in 1858. They were followed, in 1860, by a Dutch company who supplied pilots, and later a Dutch consul was posted here. During this period the merchants were forced to convoy their vessels in order to protect them against the native pirates who lurked in Pirates' creek.

The explorer Stanley arrived here in 1877, after crossing Africa and making the first descent of the Congo, and returned in 1879 to open up the country for the King of the Belgians. For the next six years Banana served as transit port for stores sent up river to Stanley's base at Vivi. In 1884 an Anglo-Portuguese treaty assigned the Congo mouth to Portugal, and in January 1885 the Portuguese gunboat *Sado*, with two other Portuguese vessels, attempted to occupy Banana but was checked by a British sloop and the French gunboat *Sagittaire* (with M. de Brazza on board). In 1885 the Berlin Conference regulated the position of the Congo basin and the Powers recognized the Congo Free State.

Captain Boyer, of the Free State Marine, buoyed the roadstead in 1887 and built a pier in 1888; a red warning light was fitted up in 1889. Because of the cool Benguela current, Banana was fancied as a bathing resort, and in 1904 a sanatorium was erected, but this proved a fiasco. When Belgium took over the country in 1908 Banana was a district headquarters and had over 100 European residents; some were in government service but most of them were employed at the head offices of the Dutch company, Nieuwe Afrikaansche Handels

Venootschap, which had its own iron pier. As Boma and Matadi developed, Banana dwindled, and attempts to develop it as a fishing-port failed.

The idea of establishing fisheries to provide a local supply of dried fish dates from 1890, when a schooner, with a Swedish master, was employed by the Compagnie du Congo and the Compagnie des Produits; the results were disappointing. In 1912 a company called the Société d'Études des Pêcheries au Congo was floated with the backing of the Société Générale de Belgique. It was decided to try fishing both in the river and in the Atlantic and to set up a fish-curing factory and an ice factory at Banana. Captain Wilverth, who had local experience, was appointed manager. The first vessel employed by this company was a motor-cutter, but afterwards it was decided to acquire a trawler which could operate to the south of the river where fish were much more plentiful. The *Jacqueline*, a small steam-trawler, was chartered from the Pêcheries à Vapeur d'Ostende. A government subsidy was made to the company. Although the results were not encouraging and the company closed down early in 1914, a limited company, the Société de Pêcheries à Vapeur au Congo Belge, was floated at Brussels in February 1920 and established at Moanda. It acquired a steam-vessel, the *Boula Matari*, but was excluded from fishing in Portuguese waters and had to sell its steamer in 1922 and confine itself to stocking dried and smoked fish sold by the Portuguese and French colonies to the Belgian Congo. In 1925 the company disposed of its depot at Banana to the Compagnie Immobilière du Congo (Immocongo).

Banana was formerly an important place and contained establishments of the Crédit Foncier, Immocongo, Nieuwe Afrikaansche Handels Venootschap, Melo Silva, Elder Dempster, Samuel, Mendes Lopes, Santos & Gonzalves, Santos & Diniz, and the Mission de Scheut, while Da Franca and Samuel were established at Nemlao, a little way up the same side of the creek. The sandbanks about Fetish rock (a little below Boma) did not permit ocean steamers to proceed upstream without unloading. They unloaded into barges in the safe haven of Banana and towed the barges alongside up to Boma. But dredging cured this difficulty and Banana's use as a haven became less and less. The drift of trade enabled the Government, in 1931, to take steps to acquire the properties of the firms already mentioned, and by 1938 all these undertakings had closed down, but negotiations were still proceeding with regard to the acquisition of a site belonging to the Portuguese Government. Nowadays Banana has ceased to be

a trading settlement and administrative headquarters and has become a pilotage and quarantine station and port of entry for Belgian Congo.

Detailed Description

Summary

Depths below Chart Datum Level	*Feet*
Channel of approach	15
Anchorage	19
Rise of tide, springs	6

Turning Space

There is sufficient turning-space for vessels of the draught which can enter the creek.

Detail

The depth alongside the concrete pier is 14 feet at low water.

Piers

In 1936, to meet the immediate necessities of local traffic, the Government built a small pier of reinforced concrete, about 65 feet long and 15 ft. 9 in. wide, terminating in a T-head, measuring 41 feet by 15 ft. 9 in. The pier was designed to carry a load of 1·5 tons per foot run or nearly 0·09 ton per square foot.

Lighters

Lighters have been employed in the past to discharge vessels. The present number of these craft is unknown.

Warehouses and Port Facilities

Banana, nearest port to the Atlantic Ocean, has a custom-house and other offices. Warehouse accommodation is small. Goods were not stored at Banana: they were transhipped into barges, and nowadays they are carried direct to Matadi.

A hand-derrick capable of lifting 1 ton was installed on the concrete pier in May 1936.

The Town

Description

The European township (*circonscription urbaine*) of Banana lies in the province of Leopoldville, district of Bas-Congo, and sub-district of Bas-Fleuve. The station consisted merely of trading factories and

still contains a few private premises, including, recently, about a dozen stores which are in the hands of Belgian and Portuguese firms, a bakery, and two hotel-restaurants (Grand Hôtel de la Plage and Werner Lanzrein). The area, however, is now mostly occupied by government offices. The executive is represented by the office of the local administrator and the custom-house, and the army by barracks. The interests of health are served by a government hospital. A dispensary is maintained by the medical foundation of the University of Louvain (Fomulac). There is a convent of Franciscan nuns who act as hospital sisters. Banana is equipped with post office, telephone exchange, wireless station, and cable station.

Trade

Banana has become a minor port, and trade has been transferred to Boma and Matadi.

The imports and exports for 1931–1936 are shown in the following table:

Imperial tons

	1931	*1932*	*1933*	*1934*	*1935*	*1936*
Imports . . .	481	251	175	185	181	178
Exports . . .	513	474	275	298	328	348
Total goods handled	994	725	450	483	509	526

Shipping

The following table shows the total number of vessels which entered the port during 1932–1936 and their tonnage:

Number

	1932	*1933*	*1934*	*1935*	*1936*
Belgian . .	96	44	13	3	1
Others . .	166	80	14	4	..
Ocean-going .	262	6	5	7	1
Coasters . .	..	118	22	..	..
Total entered .	262	124	27	7	1
Departures . .	277	124	24	7	1

Net tonnage

Ocean-going . .	831,600	13,447	10,360	16,425	1,647
Coasters . . .	..	705	245	..	..
Total entered .	831,600	14,152	10,605	16,425	1,647

This table shows very clearly the decline in the trade of Banana. For the years 1935 and 1936 only vessels which entered Banana creek have been included.

Communications

River

Boma (50 miles); Matadi (80 miles).

Roads

Cabinda (45 miles); Boma (70 miles); Tshela (150 miles); Matadi (130 miles).

2. BOMA

Lat. 5° 51′ S., long. 13° 03′. Population 5,000. Hotels. Hospitals. Cinema. Garages.

Site

The settlement of Boma climbs up the hill-side on the north or Belgian side of the river Congo. The other shore is Portuguese. The shipping quarter and port offices are built on the narrow strip of level bank. Boma owes its importance to its situation. In the lowest reaches of the river the navigable channel is separated from the mainland by a series of islands. It is only at Fingal's Shield, 3 miles below Boma, that the channel approaches the Belgian shore. Boma is also the eastern limit of easy tidal navigation up the Congo estuary. The river, which at Boma is 3 miles wide, is divided into two channels by the island of Sacra-Ambaka. The northern channel, which is enclosed between the island and the Belgian bank, is 1,000 yards wide, and deep and sluggish near the Belgian shore. This forms the harbour.

History

The background of the early history of this neighbourhood is the advent of the Portuguese at the end of the fifteenth century and the arrival of Roman Catholic missionaries on the shores of the Congo in the sixteenth and seventeenth centuries. European ships have called here to trade for 200 years. The *banza* or King's town stood originally a little distance inland and the waterside was called Lombee. Now the whole place is called Boma. The name means a python and seems to have been due to the prevalence of snakes.

Boma and Lombee had their share in the slave trade, which was suppressed in the middle of the nineteenth century. When Captain Tuckey visited it in 1816 the waterside contained about 100 huts. A little after 1860 the English firm of Hatton & Cookson opened a trading factory here, and by 1877 the number of factories had

increased to six, including Dutch, French, and Portuguese, and the European population numbered 18. In that year the explorer Stanley arrived, after descending the Congo, and received the 'freedom of Boma'. He returned to the Congo in 1879 as the agent of the King of the Belgians and the International Association, but passed Boma and made his base farther up river, at Vivi. This may have been to avoid complications with British, French, Portuguese, and Dutch gunboats, which were in the habit of visiting Boma to look after their countries' trade interests.

Mention has been made, in the account of Banana, of the Anglo-Portuguese treaty of 1884 (p. 303). In that year the Portuguese Cortes had before it a bill creating a Portuguese province of Congo, with Boma as one of its chief posts. The Portuguese gunboat *Sado* (p. 303) visited Boma in 1885 and her commander obtained from the chiefs a petition for a protectorate and hoisted the Portuguese flag on one of the heights. King Leopold had already opened, in the name of his banker Baron Lambert, a factory at Boma, which flew the Belgian flag. The manager protested to the commander of a British sloop, who compelled the Portuguese to haul down their flag. They rehoisted it, however, at Princes' isle, a little above Boma.

In 1885, as has been stated (p. 303), Boma passed to the newly created Congo Free State. Stanley says that it had increased considerably in size since his first visit. The French Roman Catholic Mission had established itself on a hill, and the river port had acquired an iron pier and a hospital. In 1886, after the establishment of the Congo Free State, the seat of government was fixed at Boma, and for the next few years building went on. Government House and the Roman Catholic church date from this period. In 1889 a second iron pier (Pier du Commerce) was constructed. An hotel was opened in 1890 which supplied meals by contract to government servants: 75 officials dined there daily. A steam tramway company opened a line in the same year, between the river and the plateau. Government took over the tramway in 1893 and ran a free service three times a day. Fort Shinkakasa was constructed between 1891 and 1894: it was the scene of a mutiny of labourers in 1900. In 1893 the draining of the marshes was begun, and between 1898 and 1900 waterworks were constructed. In 1896 the Elder Dempster steamer *Matadi* blew up at Boma, and the wreck is still visible. A railway to Tshela was made in the period 1898–1913, and in 1923 the capital of the colony was transferred from Boma to Leopoldville. The floating dock arrived in 1925, from Hamburg.

Work was begun on the construction of a river quay in 1928 and completed in 1932. In 1929 the marine workshops were transferred from the left to the right bank of the river Kalamu.

THE PORT

The river port of Boma includes a quay constructed in reinforced concrete. Reinforced piles carry decking, and the piles have been driven in line parallel to the original bank of the river. The river bank is incorporated in the quay and is defended by a dry stone wall: in front of this a pontoon is moored, alongside which river craft can berth. The old Marine Department pier, which is not included in the public port, is used for berthing vessels of the Service des Voies Navigables. The port premises have an area of 28,800 square yards and contain three warehouses. The surface of the bank up-stream from the quay is used for storage of logs. The working of the port has been entrusted to the official organization called the Office d'Exploitation des Transports Coloniaux (Otraco). There are no watering or fuelling facilities.

DETAILED DESCRIPTION

Summary

Total Area

The pool in front of Boma extends for 2 square miles.

Depths	*Feet*
In river (21½ feet reported in 1927)	26½–28
In anchorage (alongside piers)	17–23
,, ,, (,, wharf)	27

Turning Space

The navigable channel facing Boma is from half a mile to a mile wide.

Accommodation

220 yards of wharfage, 3 piers, and berths in the stream.

The average net tonnage of the ships using the port of Boma during 1935–1937 was 3,730 tons. Two ships of 3,000 tons and one of 5,000 tons can be berthed simultaneously.

Quays

Total Length	*Feet*
Stone-built quay	660

Lifting Facilities	*Capacity in tons*
1 floating crane	5
1 steam derrick (on the quay)	20
1 hand derrick	3
1 crane (mounted on a wall of the floating dock), radius 37·7 feet	3
2 railway steam cranes, radius 21·5 feet	5

Lighters

Lighters are available.

Warehouses

Dimensions

According to information derived from Belgian sources, the port contains:

	Sq. ft.
Customs warehouse	12,000
Brick and iron warehouse	12,900
Iron warehouse	4,600

Port Facilities

Floating Dock	*Feet*
Length overall	238·5
Length over blocks	213·25
Width between walls	59·0
Width overall	76·25
Height of walls above pontoon deck	23·0
Height of blocks	3·3
Depth over blocks to which dock can be submerged	16·0
	Tons
Lifting power	1,765

Repairs

Minor repairs can be effected.

THE TOWN

Description

Boma is the headquarters of the territory of Bas-Fleuve, in the district of Bas-Congo and province of Leopoldville, and has been constituted a European township. It stands on the right bank of the

Congo, at the confluence of the small stream called the Kalamu or Crocodile river. The town is well laid out and lies at the centre of a semicircle of hills which are too distant to offer any protection from the prevailing winds. It consists of two portions—Boma-Rive and Boma-Plateau—the former being the business part of the town, on the flat ground facing the river; on the latter, a small hill at the back, 190 feet high, are the houses of the officials, European and native hospitals, and barracks. The post office and custom-house occupy premises which formerly belonged to a trading firm, the Magasins Généraux. The public services include railway, pilotage, police courts, telegraph, telephone, water-supply, and electric light. Portugal has a consulate. The Place de la Marine, planted with mango trees, is near the botanical garden. At the confluence of the Crocodile river are a steam saw-mill, ice factory, and workshops of the Marine Department. There are several hotels—the Concordia, Royal, and Heindroffer & Schneider's—and a cinema. There are also tennis-courts. Missions are represented by a Roman Catholic Vicar Apostolic, the Mission of the Rev. Fathers of Scheut from Brussels, and the Christian and Missionary Alliance. The Brothers of the Christian Schools, from Brabant, keep a school for European children. Fort Shinkakasa stands on a hill to the west, 130 feet high.

Trade

The volume of trade is measured by the returns of rail and river traffic. From 1935 to 1937 the railway line between Boma and the Mayumbe country carried the following traffic:

	Imperial tons		
	1935	*1936*	*1937*
From Boma . .	6,750	8,597	12,610
To Boma . .	52,768	69,106	99,208
TOTAL . . .	59,518	77,703	111,818

The goods railed up-country consisted largely of foodstuffs and cotton piece goods. Some idea of the nature and course of the export trade is given by the following railway returns for the months January to May inclusive, in the years 1935 and 1937:

	Imperial tons	
Description	*1935*	*1937*
Palm oil . . .	3,400	4,090
Palm kernels . . .	4,900	4,470
Timber (logs and planks) .	10,350	31,090

The down traffic included small quantities—50 tons, more or less—of coffee, rubber, maize, cocoa, and fibre, and, in 1937, 117 tons of bananas. The figures show a marked increase from 1935 to 1937, and this development of the export trade has done a little to revive some of the vitality which Boma lost when the capital was removed to Leopoldville. The improvement in the timber market has been specially noteworthy since 1933. Most of the timber is shipped in logs, but some timbers, especially Limba (which is in great demand), are also shipped in planks.

The returns of river traffic for the same two years were as follows:

	Imperial tons	
	1935	*1937*
Imports	9,780	10,210
Exports	53,180	90,760
TOTAL . . .	62,960	100,970

Cattle were introduced into the island of Mateba near Boma by the Syndicat de Mateba, founded in 1887. They did very well and the meat ration reduced the death-rate among railway labourers and was perhaps the one thing which made railway construction possible. Between 1895 and 1910, 13,150 head of cattle were sold or slaughtered: the number sold during 1936 was 1,300, besides 400 pigs. During the same year the Compagnie des Produits du Congo imported 700 tons of refrigerated provisions from Antwerp and 100 tons from Cape Colony.

Banking is represented by the Banco de Angola, Banque Belge d'Afrique, Banque du Congo Belge, and Banque Commerciale du Congo. In the large commercial quarter a Liverpool firm, Messrs. Hatton & Cookson Ltd., has a store. Among other businesses are contractors, garages, watch-repairers, shipping companies, and a travel agency (Compagnie Maritime Belge).

Shipping

The traffic of the port during the years 1935–1937 was as follows:

	Vessels entered		
		Tons	*Tons*
Year	*No.*	*net*	*gross*
1935 . .	110	431,740	670,000
1936 . .	159	499,650	785,000
1937 . .	146	479,245	735,000

In 1898 there were five shipping lines running between Europe and the Congo, viz. the combined services of the Compagnie Belge Mari-

time du Congo—'C.B.M.C.'—and the Société Maritime du Congo (Antwerp); the combination of the Chargeurs Réunis (Havre) and Fraissinet & Cie (Marseilles); the Woermann Linie (Hamburg); and the African Steamship Co. and British & African Steam Navigation Co.—agents, Messrs. Elder Dempster & Co. Ltd. (Liverpool). The fifth was L'Empreza Nacional de Navegaçao (Lisbon) which ran to Cabinda or San Antonio, where a Congo Free State steamer picked up passengers and mails for the Congo.

The C.B.M.C. were closely linked with Elder Dempster. They took over the old E.D. ships; e.g. the first *Bruxellesville* was originally the *Zungeru*. In 1908 a Belgian, Captain Van Rooy, became master of a later *Bruxellesville*. Until then the Belgian steamers had almost always had British captains, and there were British engineers on the 'Ville' boats until 1916.

In 1930 the C.B.M.C. amalgamated with one of the principal Belgian shipping companies—the Lloyd Royal. The combine took the name of Compagnie Maritime Belge Lloyd Royal (C.M.B.). Some of the C.M.B.'s cargo steamers are constructed to carry palm oil in bulk. The M.V. *Moanda*, launched in 1937, was built to carry 1,170 tons of palm oil in four tanks. Another special traffic is the banana trade: all the passenger steamers were fitted up for this in 1935.

In 1938 ten Belgian cargo steamers, of 4,000 to 8,000 tons each, ran between Antwerp and Boma. The *Mobeka* and the *Moero* (8,000 tons each), which were put in commission in 1937, were driven by Diesel engines, developing 3,400 h.p. The latest mail steamers or 'Ville' boats consisted of the *Anversville* (7,694 tons), *Elisabethville* and *Thysville* (8,300 tons each), *Albertville* (10,630 tons), and *Leopoldville* (11,439 tons). In 1938 an order was placed for the building of a new steamer.

There has been, for some time, a bi-weekly service between Boma and Matadi and a weekly service between Boma and Banana.

Local Industries

These include fishing and manufacture of bricks, tiles, ice, and soap.

Communications

Estuary and River

W. Banana (50 miles).

E. Ango Ango (26 miles); Matadi (30 miles).

Roads

Banana (70 miles); Cabinda (85 miles); Tshela (90 miles); Matadi (65 miles).

Railway

N. Tshela (87 miles).

The quay is connected with the railway and steamers discharge direct into trucks.

3. NOQUI (NOKI)

Lat. 5° 51′ S., long. 13° 26′.

This is a small river Congo port in the Portuguese colony of Angola and is mentioned here only to make the list complete. It lies on the east bank, 1½ miles south of Ango Ango and 5½ miles downstream from Matadi. Steamers can, with some difficulty, anchor close in to the bank.

4. ANGO ANGO

Lat. 5° 50′ S., long. 13° 26′.

SITE

The port of Ango Ango lies on the left bank of the Congo between the Devil's Cauldron and Noqui (Noki) on the frontier of Angola. Steamers can draw in to the eastern bank at three places. The first has a floating pontoon and is inside the concession belonging to the Société des Pétroles au Congo (Petrocongo), above the confluence of the river Ango Ango. The next, just below the Ango Ango river, has been acquired by the Huileries du Congo Belge (Lever Bros.) for the eventual extension of its installations for the storage and shipment of palm oil in bulk. The last is the public port and lies between the Huileries' concession and the frontier. These landing-places are all served by an extension of the railway which connects Leopoldville with Matadi.

HISTORY

Ango Ango was developed in order to avoid the unloading of inflammable oil or explosives at Matadi, and also to enable craft which were too slow to force the passage of the Devil's Cauldron and the narrows, opposite the old mission station of Underhill, to discharge their cargoes alongside and not into lighters: at high river



68. *Quay at Boma. Note timber from Mayumbe awaiting shipment*



69. *Ango-Ango. Oil tanks and jetty*



70. *General view, Matadi*



71. *Quay at Matadi*



72. *Port warehouses and marshalling yard at Matadi*

the current runs at from 10 to 11 knots. The original idea was to erect a concrete jetty. The work was given out on contract in 1926 to a British firm, Messrs. Perry & Co. (Bow) Ltd., of London, who for the purpose of this and similar contracts formed a Brussels company, the Société de Constructions Coloniales et Continentales (Construcol), but in 1929 the contract was cancelled and the work transferred to the Public Works Department, in collaboration with German consulting engineers. The results, however, were unsuccessful, and in July 1930 the idea of a concrete jetty was abandoned after a total expenditure of 50,000,000 francs. The Minister for the Colonies then decided upon the construction of an iron jetty parallel to the bank and connected with it by a bridge, and gave the contract to the Compagnie du Chemin de Fer du Congo. The work was begun in 1931 and taken over in 1932; it cost 6,250,000 francs. The connecting bridge had to be repaired in 1935. To prevent the buckling of the piles, they were packed in stone.

Detailed Description

Depths

Throughout the year there is a minimum draught of 25½ feet. Steamers discharging oil to Petrocongo lie in 10 fathoms depth alongside the floating pontoon.

Turning Space

The navigable channel is over ½ mile wide.

Accommodation

Tankers up to 9,800 tons can berth at Ango Ango.

Pier	*Feet*
Length	390
Width	39

Lifting Facilities

None.

Warehouses

At the Public Port:

One warehouse (147 feet × 49 feet).

Storage Tanks	*Tons*	*Gallons*
Storage tanks for petrol in bulk :		
2 tanks, each 528,000 galls.	3,360	1,056,000
1 tank	1,050	330,000
4 tanks, each 264,000 galls.	3,360	1,056,000
8 tanks, each 220,000 galls.	5,600	1,760,000
Barge *Mazout II*	1,050	330,000
TOTAL	14,420	4,532,000

THE TOWN

Description

Ango Ango lies in the sub-district of Matadi, in the district of Bas-Congo and province of Leopoldville. There is very little to describe beyond the establishments of the two companies already mentioned. Ango Ango is a commercial depot, not a residential town. It contains the office of the local administrator. The railway premises occupy a terrace behind the Government wharf and the Government station lies between two hill streams. There is a 4-inch rising main from Ango Ango to Leopoldville, for pumping crude oil to Stanley Pool.

Trade

The trade returns are included in those of Matadi, but, as Ango Ango was built expressly as a depot for the reception of inflammable goods, it may be taken that most of the petrol, petroleum, and fuel oil is landed here and that the exports are few. The imports for the colony for 1934–1936 were:

	Imperial tons		
	1934	*1935*	*1936*
Petroleum	845	1,290	1,677
Petrol	10,536	11,060	16,525
Fuel oil and other combustible oil	210	277	3,406
Lubricants	1,898	2,168	2,085
Other industrial oils	122	158	164
Industrial grease	86	157	161
TOTAL	13,697	15,110	24,018

Of the 1935 total, 9,486 imperial tons were landed at the beach of the Société des Pétroles au Congo.

Shipping

The shipping consists mainly of oil tankers. The 7,000-ton tanker *Président Francqui*, which belongs to the Société des Pétroles au

Congo, was specially built for this traffic and can moor here at all seasons. Occasionally, underpowered vessels, unsuccessful in their efforts to breast the 10–11 knot current in the Devil's Cauldron which bars the entrance to Matadi harbour, tie up at Ango Ango and discharge passengers and freight. The shipping returns are included in those of Matadi.

Communications

River

Down. Noqui (1½ miles); Boma (26 miles); Banana (76 miles).
Up. Matadi (4 miles).

Roads

NE. Matadi (4 miles); San Salvador (90 miles); and Maquela do Zombo in Angola (160 miles).

Railways

Matadi (4 miles); Leopoldville (232 miles).

5. MATADI

Lat. 5° 49′ S., long. 13° 28′. Population (estimated) 10,000, including 370 whites. Hotels. Hospitals. Garages. Cinema.

SITE (Fig. 53)

Matadi is the highest point to which ocean-going vessels ascend the Congo (Fig. 2). Two miles above it are rapids, but, from the head of the estuary to Matadi, a distance of 30 miles, the river is nearly a mile wide and the channel, in places, 200–300 feet deep. A little below the rapids the river rounds 2 points on the south bank, 2 miles apart. Between these there is a slight bay, with 20 feet of water near the bank, sheltered from the current. Half-way round the bay the bank has been filled in at two places—Venise and Fuca-Fuca—and faced with quays for half a mile. There is a sandbank at either end of the harbour. Matadi, or Matari, means 'rocks'. The rocky hill-side does not leave much space for shore installations, but the site was chosen as the terminus of a railway, and a tunnel through the eastern headland admits the line from Leopoldville. In the other direction the railway skirts the river to Ango Ango.

History

Matadi is associated with two explorers. In 1485 Diego Cam passed it going upstream and in 1877 Stanley, going down. It was a saying of Stanley's that without a railway the Congo was not worth

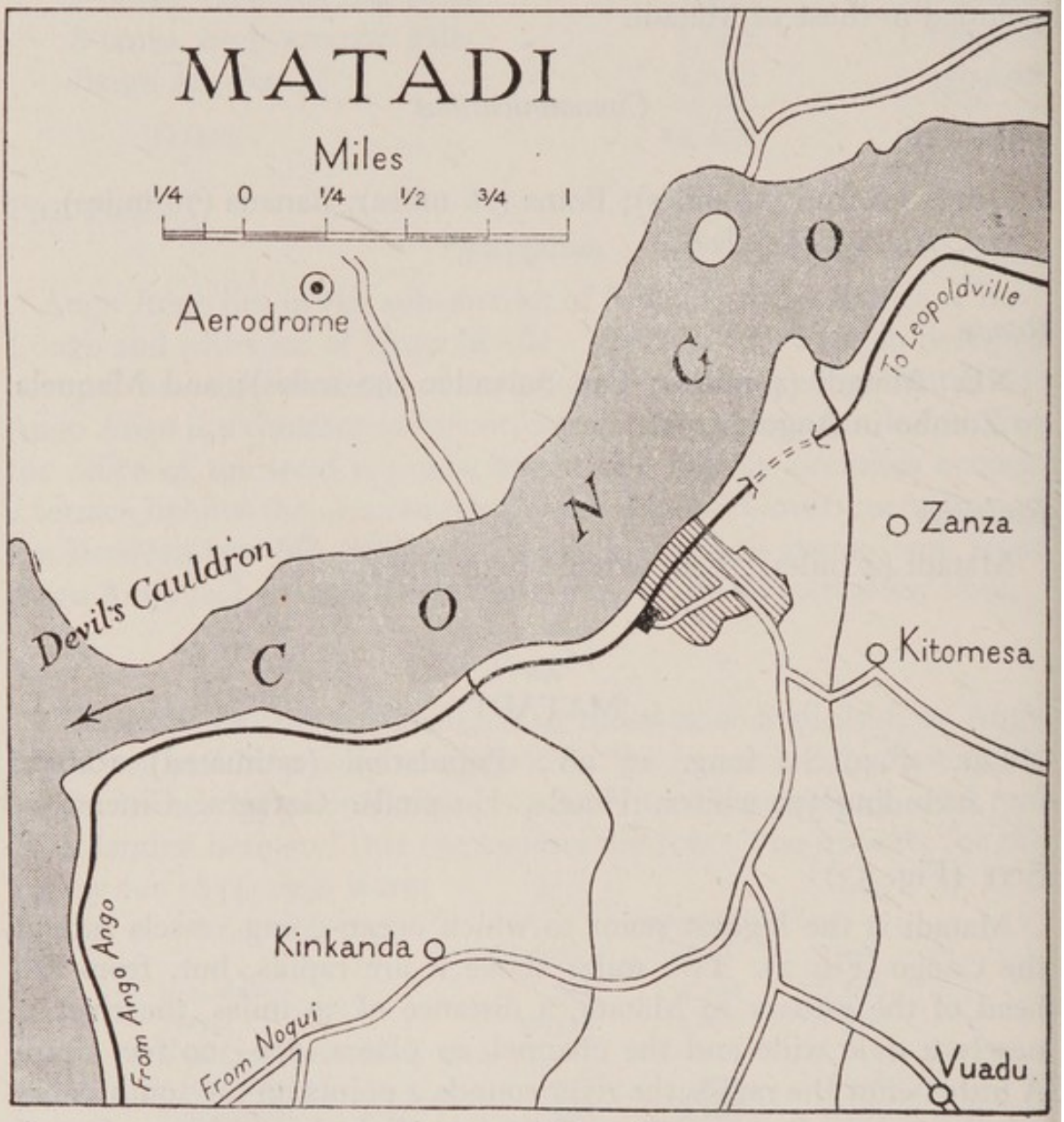


FIG. 53 *Matadi*

two shillings. In 1887 Captain Thys (afterwards General Thys, commemorated in ' Thysville ') arrived at Matadi to start the survey for the railway and pitched his tents on the narrow strip between rocks and river. The Compagnie du Chemin de Fer du Congo (C.C.F.C.) was floated in 1889. Construction was begun in 1890 and a site for a station cleared by blasting. In 1898 railhead reached Stanley Pool.

By an agreement entered into in 1889 between the Congo Free State and the C.C.F.C., the company agreed to construct and enlarge the port of Matadi in exchange for the right to levy tolls till 1997. In 1890, just before railway construction began, an iron pier was erected and it was there that component parts of the first three locomotives were landed. A second pier was built in or shortly after 1897. The T-heads of the two piers were extended till, by 1907, each head was over 100 yards long. Each pier carried two railway tracks, and port facilities included steam cranes and barges of 50–100 tons. At this period Matadi was the best-equipped port in western equatorial Africa and, with the exception of Boma, the only place where ships could load and discharge directly from and into railway trucks.

In 1911 the Minister for the Colonies approved the proposal of the C.C.F.C. to connect the T-heads of the two piers and extend the quayage. During the War of 1914–1918 the railway was continued to Ango Ango, and after the war the gauge of the railway was increased from 2 ft. 6 in. (0·75 m.) to 3 ft. 6 in. (1·067 m.). A large new warehouse was built in 1914, and in 1919 a new custom-house was erected. In 1937 the custom-house was taken to pieces and reconstructed on its present site. Two warehouses were added in 1922 and 1925. The quays (which had to be built above flood level) were too high for small craft. In 1921–1922, therefore, the C.C.F.C. constructed for Government a pier to which a pontoon was moored, and this was connected to the other quays in 1924–1925. In 1924 and 1926 the foreshore at Fuca-Fuca and Venise was reclaimed. The Government decided to extend the harbour by constructing a quay at Fuca-Fuca. In 1926 a contract was placed with the Société de Constructions Coloniales et Continentales, but the contract was afterwards cancelled and the work transferred to the C.C.F.C. A conflict of interests between the Government and the railway shareholders led to the voluntary liquidation of the C.C.F.C. in 1936; it was replaced by the Otraco (page 327), which now manages the railway lines and the port. The Otraco has a small shipyard downstream and adjacent to the port. There is very little space for the enlargement of the shipyard, as the hill rises steeply from the water's edge and much of the space already used had to be excavated. The Compagnie Maritime Belge also has a yard and an insurance department. When the C.C.F.C. was replaced by the Otraco the Government undertook the cost of development of the port, and the Otraco became liable only for working expenses.

While these railway and port works were in progress a few

bungalows had been erected, and the railway company had in 1911 established a stock farm and a European hospital in care of 4 nuns and 3 priests from Ghent. In 1898 the streets were lit by paraffin lamps. This installation is now defunct and has not yet been replaced by a public electric-lighting scheme. In 1900 the railway company constructed a reservoir and brought water by pipe-line into its concession. The Government raised the level of the dam in 1903 so as to increase the capacity of the reservoir to 660,000 gallons, but mains were not laid in the commercial quarter till 1928. During the interval the town was supplied by stand-pipes connected with the railway main. As the town climbed the hill-side, more reservoirs had to be constructed at higher levels: this was done in 1930–1933. In December 1927 an epidemic of yellow fever at Matadi carried off 17 Europeans. This led to the building of several kilometres of concrete drains. In 1932 a new hospital was erected at public cost to replace two small native hospitals. There is also a Home for African seamen called, in the Lingala ('Bangala') language, Ndako ya Bisu ('Our Home').

Detailed Description

Summary

Depths	*Feet*
In channel of approach. Depth depends on control of shifting sand banks, minimum in 1939 . . .	25·5
Alongside quay at low water	26·3
Anchorage, at a distance of 164 feet from shore (at low water)	26
Note. There is a difference between flood and low water of about	23

Accommodation

Steamer quay. Eight ships of 5,000 to 6,000 tons.
Anchorage. No information as to number of ships.

Quays

Lengths	*Feet*
Steamer quay	3,411
Quay for barges	138

Lifting Facilities

Pier	*Capacity in tons*
10 electric wharf cranes	3
1 „ „ crane	1
1 travelling crane	50
Warehouses	
6 steam cranes	1½
3 „ „	3
3 „ „	5
Unspecified positions in port	
1 travelling crane	2½
1 „ „	10

Warehouses

Matadi pier	*Sq. feet*
3 warehouses, called A, B, and C, each 148×66 feet (9,768 sq. ft.). Total area	29,304
2 warehouses (M. and N.). Total area	30,138
TOTAL	59,442

Port Facilities

The Otraco yard is suitable for assembling barges and trawlers up to 200 tons capacity. There are two patent slips, or marine railways, each 321 feet long, with a gradient of about 1 inch per foot, for handling vessels sidewise. A third slip is projected. The workshop is very old-fashioned, but is under process of modernization.

Otraco also act as agents to clear goods through the customs and as warehousemen.

No oil fuel is available.

Repairs

Above-water repairs can be affected.

THE TOWN

Description

The town lies on the hill-side, between the spurs of Point Leopold II and Kala Kala. The slope limits building space, and some of the streets are so steep that they end in steps. Since 1930 the roads have been improved. The principal streets have been paved with concrete

flags, and port and railway station are connected by a 20-foot concreted thoroughfare.

The gradual growth of certain amenities, such as water-supply, has been described above (p. 320). The waterworks are in the charge of the Government. In addition to the dams, an Otto filter, with a capacity of 27,500 gallons per hour, and a sterilization plant have been installed at an altitude of 1,000 feet. The water is distributed through 7 miles of pipes from two reservoirs, at altitudes of 800 feet and 300 feet respectively. The former has a capacity of 125,840 gallons and the latter a capacity of 88,000 gallons. A small extra reservoir of 6,600 gallons capacity is provided in the native quarter. The water is delivered to European premises through branch pipes and meters; the price in 1938 was two centimes per gallon. The inhabitants of the native quarter enjoy a free water-supply at 10 stand-pipes and 12 washing-places.

Matadi, like Banana and Boma, is a European township. The native quarter has been mentioned: it has been created a *centre extra-coutumier*, or detribalized native zone. Matadi is the headquarters of the sub-district of Matadi and is in the apostolic vicariate of Leopoldville. The Administrator has his office here, but the Vicar Apostolic lives at Tumba, half-way up the railway line. Matadi is a station of the Redemptorist Fathers and of the Swedish Protestant Mission. There is a church in the centre, a cemetery at the east end, and a primary school for European children within the boundaries. Among other public institutions are the government hospitals for Europeans and natives, post office, railway station, locomotive erection and repair shops, Chamber of Commerce, office of civil status (registration of births, deaths, and marriages), notary's chambers, and British, French, Norwegian, and Portuguese consulates. The Banque Belge d'Afrique, Banque du Congo Belge, and Banque Commerciale du Congo have branches. Hotel-restaurants comprise the Congomane, Compagnie du Kasai, Damar, Métropole, Plantations et Élevages de Kitobola (P.E.K.), and Union. Moving pictures are shown at the Ciné-Palace. Business premises include cold storage, garage (Durant & Huberlant), and shipping offices. Among the trading companies are two British firms—Messrs. Hatton & Cookson Ltd. and Messrs. G. B. Ollivant & Co. Ltd.

Trade

Over half of the imports and exports of the Belgian Congo pass through Matadi. During the period 1935–1937 the goods handled

at the port, exclusive of petroleum and petrol landed at the beach of the Société des Pétroles au Congo at Ango Ango, were as follows:

	Imperial tons		
	1935	*1936*	*1937*
Imports . . .	93,995	131,005	188,412
Exports . . .	255,044	280,782	343,861
TOTAL . .	349,039	411,787	532,273

Shipping

The traffic of the port during the years 1935–1937 was as follows:

	Vessels entered		
		Tons	*Tons*
Year	*No.*	*net*	*gross*
1935 . .	120	330,730	530,000
1936 . .	133	379,365	600,000
1937 . .	144	422,860	665,000

A comparison between Belgian shipping in 1927 and 1936 shows the development of the port:

Belgian cargo steamers in the port of Matadi . .	*1927*	*1936*
Total stay in port (days)	729	400
Average idle period (days)	31·6	10
	Imperial tons	
Tonnage handled per ship per day . . .	152	537

It will be seen that the tonnage handled has nearly quadrupled. It frequently happens, moreover, that the average tonnage handled is greatly exceeded. In 1937 the British steamer *London Corporation* established a record by loading 5,412 tons in 6 days, or an average of 902 tons per day; and in the same year the *Carlier* handled 1,937 tons in one day. The shipping of palm oil in bulk will further speed up traffic.

The shipping lines using the port in 1940 were:

American West African Line: Matadi–New York.
Compagnie des Chargeurs Réunis.
Compagnie Française du Bas et du Haut Congo.
Compagnie Maritime Belge.
Companhia Nacional de Navegaçao.
Deutsche Ost-Afrika-Linie.
Elder Dempster & Co. Ltd.
Hamburg–Afrika Linie.
Navigaziona Libera Triestina.

Société Africaine de Transports.
Thesen Line: Capetown–Matadi.
Woermann, Brock & Co.

Communications

River

Ango Ango (4 miles); Noqui (5½ miles); Boma (30 miles); Banana (80 miles).

Railway

Leopoldville (232 miles).

Road

Banana (130 miles); Cabinda (150 miles); Boma (65 miles); Tshela (120 miles).

II. RIVER PORTS

INLAND water transport fills so large a place in the life of the Belgian Congo that some description of river and lake ports must be given. In Stanley Pool and on Lake Tanganyika they differ little from minor seaports. On the other hand, many landing places have no facilities other than a gangplank. The important ones are those where bulk is broken between water and railway traffic. The ports herein described are those which provide facilities and installations for dealing with cargo and where ships can lie alongside.

1. LEOPOLDVILLE

Lat. 4° 20′ S., long. 15° 21′. Altitude 1,017 feet. Population (1939) 41,511. Hotels. Hospitals. Cinemas. Garages.

SITE (Fig. 54)

Four hundred miles from its outlet to the Atlantic the Congo contracts to a width of a mile, and for over 100 miles it hurries westwards through the Channel till it expands into Stanley Pool, 14 miles wide and 20 miles long, with its large central island, Bamu, which is really a cluster of sandbanks, covered with bush. Fishermen land on some of these sandbanks to smoke their fish. Below Bamu the river contracts to 2½ miles, and it gradually narrows till, 5 miles farther on, its width has shrunk to a mile and it drops over the ledge of the Kintamo rapids. Leopoldville lies stretched out along the southern bank, which is not, however, all occupied. The river front is split by Kalina point, rising abruptly 50 feet from the water. The current

races round this cliff. To the east lie the docks and shipyards of Kinshasa and Dolo. These include the premises of the Huileries Congo Belge (H.C.B.), public port, landing-stage, the docks and shipyard of the Otraco at Port Citas, and the shipyard and workshop of the Ateliers et Chantiers Navals du Stanley Pool (Atena) at Dolo.

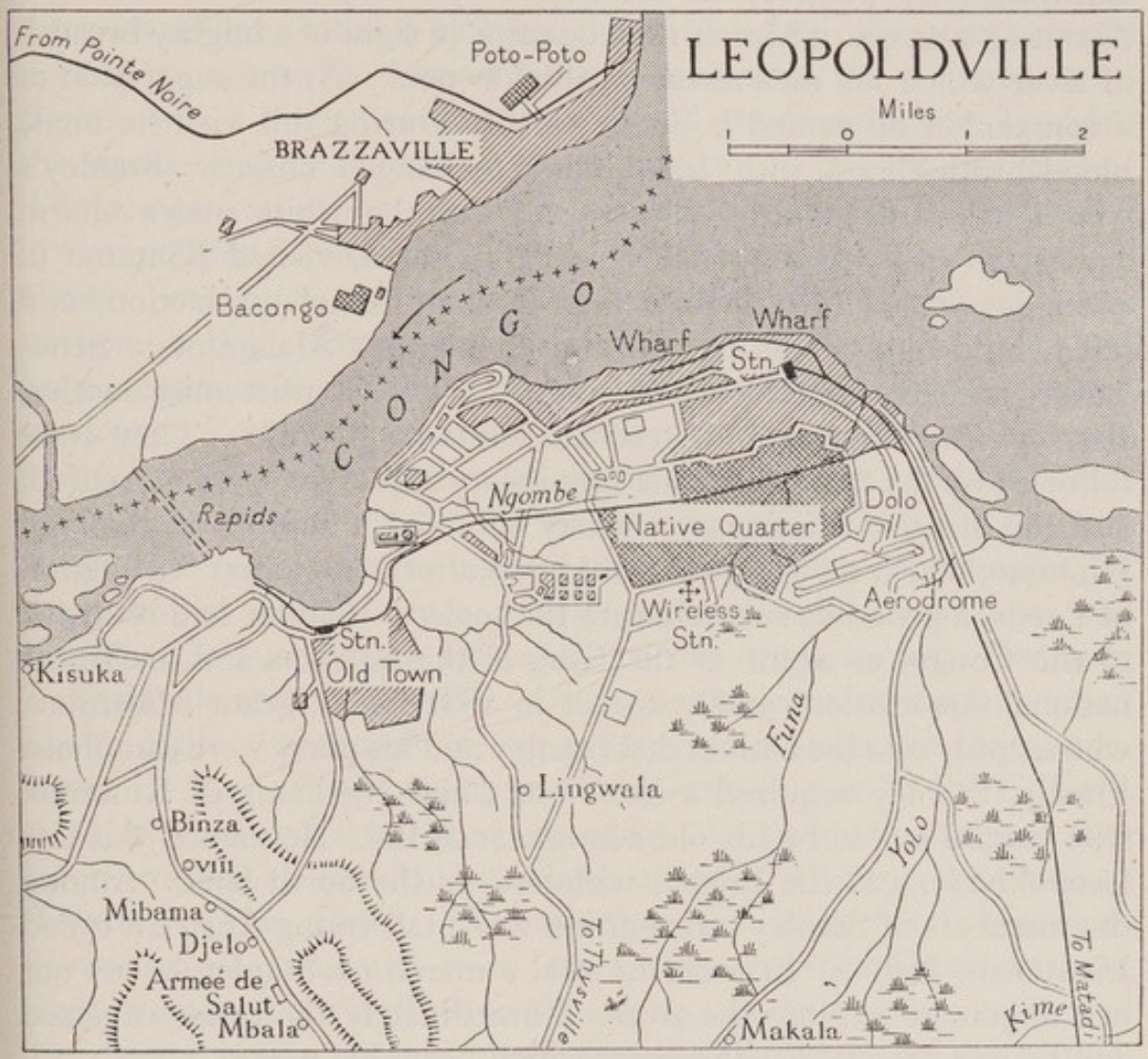


FIG. 54 *Leopoldville*

To the west is a series of bays; on the most westerly bay lies old Leopoldville and the yard of the Chantier Naval et Industriel du Congo (Chanic), where the original port of Leopoldville lay within 500 yards of the rapids. The railway line from Matadi approaches from the south and curves west to its terminus at old Leopoldville.

HISTORY

Recent discoveries of flint weapons prove that the shores of Stanley Pool were inhabited in very ancient times. The Wambundu claimed

to be the original owners of the site of Leopoldville before the Belgian development, but some Bateke had crossed the Congo and founded villages at Kinshasa and Kintamo. One of these Bateke was named Itsi. Originally a slave, bartered for a dish, he founded and colonized Kintamo and made it a depot for ivory. The country was opened to Europeans by Stanley, on his famous journey down the Congo. About 11 a.m. on 12 March 1877 he came in sight of a mighty breadth of river which his men at once called a 'pool'. At the suggestion of a companion he named it Stanley Pool. During this visit he made blood-brotherhood with Itsi. They exchanged charms: Stanley's was a half-ounce bottle of magnesia, 'as the white man's charm against all evil'. His French rival, De Brazza, visited Kintamo in 1880, persuaded the inhabitants to accept French protection, and left behind him, as his representative, Sergeant Malamine, a Senegalese, and one or two native soldiers. Two Baptist missionaries, Bentley and Crudgington, reached Kintamo in 1881. They were followed by the famous Baptist missionary explorer George Grenfell, and the Baptist Missionary Society founded a station overlooking Kintamo, which they named Arthington after Mr. Robert Arthington of Leeds, a generous subscriber to the society. Stanley had returned to the Congo, as agent of the King of the Belgians and his International Association, and was met in 1881 by Sergeant Malamine, who secretly told the natives that Stanley and his party were cannibals. Finally, Stanley acquired a site from Chief Ngaliema of Kintamo, who turned out to be his old acquaintance Itsi. He named this site Leopoldville, and the French withdrew to the north bank. Among the members of Stanley's expedition was a tall young Austrian called Lieutenant Kalina. In order to steal a march on Stanley he set out in a dugout to explore the river. Unfortunately the canoe capsized and he was drowned at the point which bears his name.

The station in 1883 consisted of a log blockhouse and a few bungalows built on a terrace cut in the hill-side, and a row of huts leading to the waterside. A quarter of a mile away, on the top of the hill, was the Baptist mission, commanding a view of almost the whole extent of Stanley Pool. Near the station were native plantations. The first European vessels to be launched in Stanley Pool are described in Chapter XV.

For some years after the settlement of Europeans at Stanley Pool the food-supply was a difficulty. There was not a large population on the southern shores of Stanley Pool, and the Europeans soon ate up all the available fowls, pigs, goats, and sheep. As a substitute for

cereals they ate 'kwanga', a pudding made from cassava flour and not at all unappetizing when fried. Fish—fresh or smoked—could sometimes be obtained from the native fishermen. There was very little game; altogether, the region of Stanley Pool, and especially the vicinity of Leopoldville, was not a happy place of residence in the eighties. Two hundred and thirty miles of difficult and wearisome travel connected it with the nearest seaport. Supplies brought over these 230 miles were expensive; moreover, the recruitment of porters was a matter of uncertainty, and goods would be stranded for weeks or months at Manyanga, midway in the cataract region. The completion of the railway in the nineties altered the position.

Competition for Africa led to the Berlin Conference of 1885. The Congo Free State was established in 1885, with the proviso that navigation of the Congo should be free. By 1898 a railway line had been constructed from Matadi to Dolo, on Stanley Pool. In 1908 the Congo Free State became the Belgian Congo. A concession was granted for the construction of a pipe-line to carry crude oil from Matadi to Leopoldville for the use of river steamers. The line was laid in 1911–14. After the lapse of 70 years it becomes the property of the Colonial Government. Development was interrupted by the War of 1914–1918, but in 1920 an air service was inaugurated between Leopoldville and Stanleyville. Owing to the growing importance of Leopoldville the capital of the colony was transferred there from Boma in 1923. River transport was originally run by the Government Marine and later by a company. In 1925 the company was reconstructed as the Union Nationale des Transports Fluviaux (Unatra). The Congo was affected by the general economic depression of 1934, and it is noteworthy that the Diesel-engined river steamers were the first to be laid up. Since Belgium took over the colony it has done a great deal for the health of the people, and in 1936 the hospitals and laboratories of Leopoldville were supplemented by the opening of a school for training native medical assistants. The Unatra having gone into liquidation, on 1 September 1936, the working of its fleet was handed over by the Colonial Government to the Office d'Exploitation des Transports Coloniaux (Otraco), which also works the public port.

Nineteen hundred and forty brought disaster to the mother country. On 28 May 1940—a day after the capitulation of Belgium to Germany—Governor-General Ryckmans, broadcasting from Leopoldville, declared that Belgium lived wherever her flag waved. The Government in Leopoldville threw in its lot with Great Britain,

and it was from Leopoldville that the French General de Larminat entered Brazzaville to set up a Free French government on 28 August 1940. The same year British military and economic missions visited Leopoldville. In November 1941 the first Miami–Leopoldville air clipper alighted on Stanley Pool.

Detailed Description

Summary

Depths

The river level at Leopoldville varies by about 23 feet, according to the year and to the season of year. At Leopoldville the Congo is at its lowest in July and August, but vessels can approach the quay at the public port at all seasons: when the river is at its lowest they may have to lie a few feet off, but within reach of cranes. In the pool the Belgian channel to the south of Bamu has a depth varying from 6 to 20 feet, while the French channel to the north is almost everywhere over 10 feet. For depths between Leopoldville and Stanleyville, *see* Stanleyville.

Quays

Total Lengths	*Feet*
Port Public	1,373
Port Citas	950

Lifting Facilities	*Radius in feet*	*Capacity in tons*
Port Public		
6 electric cranes, each		1·5
Port Citas		
2 electric gantries	57	1·5
2 travelling cranes	19·7	1·5
1 electric gantry	32·8	0·6
1 travelling steam crane		6
1 travelling electric gantry	14	15

besides a 10-ton crane at the shipyard of Otraco and a hand derrick, with a 15-ton capacity and a radius of 16·4 to 49·2 feet at the shipyard of the Société pour le Transport et le Commerce en Afrique (Tracoma): this yard is managed by the Ateliers et Chantiers Navals du Stanley Pool and hence is usually known as the 'Atena'.

Warehouses

Dimensions	*Feet*	*Sq. feet*
Port Public		
(*a*) Warehouse; 3 portions now transformed into one.		
Shed No. 1	157 × 131	
Covered yard	49 × 131	47,553
Shed No. 2	157 × 131	
		47,553
(*b*) Shed No. 6	114·8 × 41	4,706·8
(*c*) Shed No. 7	105 × 19·7	2,068·5
(*d*) Société Commerciale du Centre Africain (Socca) warehouse	275·6 × 65·6	18,079·3
(*e*) Atena	118·1 × 164	19,368·4
Port Citas		
Principal warehouse		75,448
Other warehouses		21,665
Total area		188,889

Petrol

Tanks	*Tons*	*Imperial gallons*
6 tanks, each 329,955 gallons	6,300	1,979,730
3 tanks, each 43,994 ,,	420	131,982
2 tanks, each 10,998·5 ,,	70	21,997
	6,790	2,133,709
Barges		
The barge *Louise* ,,	245	76,989
2 each 21,997 ,,	140	43,994
2 each 10,998·5 ,,	70	21,997
	455	142,980
Railway tank wagons, Matadi–Leopoldville		
10 tank wagons, each 4399·4 imperial gallons		43,994
14 tank wagons, each 6599·1 imperial gallons		134,387·4

Pipe-line

There is a rising main conveying oil from Ango Ango to Leopoldville.

Port Facilities

Floating Docks (2)	*Capacity in tons*
Chanic	784
Otraco	784

Slipways	*Length in Feet*
Chanic	
1 launching slip	590·6
1 repair slip	295·3

Otraco

4 slipways for large barges
9 slipways for smaller craft

Atena

1 slip 196·9 feet long and 11 cradles with a total capacity of 40 tons.

Note. During the months of July and August only vessels drawing less than 2 ft. 7·4 in. can use the slip.

The Town

Description

Leopoldville is the capital of the colony, the headquarters of the province of Leopoldville, and a European township situated in an urban district (Fig. 54). The Governor-General resides here. The government establishments include the Treasury, customs, posts and telegraphs, telephones, wireless station, Public Works Department, and other government offices and the superior and inferior courts. A new and powerful short-wave wireless station was opened on 16 May 1943 at Leopoldville for the purpose of securing constant and direct communication between occupied Belgium and its Government in London. Seven *avocats* practise in Leopoldville, and there is a notary's office. Near the government offices is the residential area for civil servants. The offices and quarters of the Huileries Congo Belge (H.C.B.) are at Pointe Anglaise, to the east of the government quarter. The European residential areas are laid out in squares, and the bungalows are enclosed in gardens. The medical establishments include European and native hospitals,



73. *Leopoldville. The quays. Stern-wheel passenger steamer, 'Kigoma', alongside*



74. *Leopoldville (Kinshasa). East of quays. A.B.C. hotel in centre. Cathedral to right of centre*



75. *Leopoldville West (Kintamo). Shipbuilding yard of Chanic in foreground*



76. *Stanleyville, north bank*

To right, modern stern-wheel passenger steamer, astern of her an 800-ton cargo vessel (also a stern-wheeler). In the bottom left hand is one of the H.C.B. steamers



77. *Stanleyville. Ferry*



78. *Kasenyi pier, Lake Albert*

government dispensary, consumptive sanatorium, medical school, V.D. clinic, and laboratories. Besides government medical officers there are the doctors in the service of Otraco and Chanic, medical missionaries, and, in 1940, a private practitioner. There were also one or two dentists and druggists (including the government dispensary).

The business quarter contains good and well-designed buildings. Special mention may be made of the two-story office of Otraco and the three banks. Near the latter stands the four-story hotel 'A.B.C.' There are five other hotels and five cafés. Great Britain, the United States, France, Denmark, Greece, Holland, Portugal, Sweden, Switzerland, Czechoslovakia, and Italy normally have consulates. Leopoldville has two cinemas and ten clubs. The shops are near the banks. Besides Petrocongo, petrol dealers include Shell, the Texas Co., and the Vacuum Oil Co.

Leopoldville is both a Roman Catholic and a Protestant mission station. The Roman Catholics are represented by a Papal Nuncio and a Vicar Apostolic. The Fathers of Scheut and the Brothers of the Christian Schools keep schools for boys and the Franciscan nuns and the nuns of the Sacred Heart manage girls' schools. The Canonesses of St. Augustine train native girls. Protestant missions comprise the Baptist Missionary Society, American Baptist Foreign Missionary Society, and Salvation Army, who also carry on educational work. The Baptist Missionary Society's premises lie to the east of the government quarter.

The headquarters of the Colonial Army (*Force Publique*) are at Leopoldville, and on the outskirts of the town there are artillery and infantry camps.

Mention has been made of the railway, which runs through the town, from east to west, and has two stations at Kinshasa, and another at old Leopoldville. The Sabena airfield is at Dolo, an eastern suburb of Leopoldville.

Trade

The principal trade consists in the import of European goods and the export of native products. Among the merchants may be noted Messrs. G. B. Ollivant & Co. Ltd. and the Compagnie Française de l'Afrique Occidentale (C.F.A.O.), both well known in British West Africa. The nature and quantity of exports and imports are shown in the traffic returns. Traffic comes by land, water, and air. The

water-borne goods traffic of the port of Leopoldville during 1935–1937 was as follows:

	Imperial tons		
	1935	*1936*	*1937*
Upstream . .	81,575	128,655	166,159
Down . .	249,573	278,425	343,003
TOTAL .	331,148	407,080	509,162

The principal products handled in the port during these years were:

	Imperial tons		
	1935	*1936*	*1937*
Copper . .	73,000	53,000	77,000
Palm kernels .	50,000	66,000	75,000
Palm oil . .	50,000	57,000	64,000
Cotton . .	25,000	29,000	36,000
Coffee . .	13,000	17,000	18,000
Copal . .	15,000	21,000	18,000
Timber . .	5,000	7,000	12,000
Maize . .	2,000	4,000	11,000
Cassiterite . .	5,000	5,000	8,000
Ground-nuts .	800	4,000	4,000

There was also a little rubber, tin, wax, ivory, and sesame. The export of rubber and also of tin has probably increased.

The railway traffic during the same period was:

	Imperial tons		
	1935	*1936*	*1937*
Upstream .	97,822	141,969	199,365
Down . .	253,572	284,618	339,297
TOTAL .	351,394	426,587	538,662

The air traffic for 1937 was:

	In	*Out*	*Through*	*Total*
Aircraft . .	228	224	..	452
Passengers . .	619	667	210	1,496
Goods and excess luggage	17 t. 6 cwt.	1 t. 3 cwt.	..	18 t. 9 cwt.
Mails (including printed papers and parcels) .	6 t. 17 cwt.	13 t. 1 cwt.	..	19 t. 18 cwt.

Leopoldville contains a Chamber of Commerce and offices of three banks—Banque Belge d'Afrique, Banque du Congo Belge, and Banque Commerciale du Congo. There are also half a dozen insurance offices. Other businesses include garages, cold storage,

transport companies, and shipping and tourist agencies, including Messrs. Cook, and in addition all the tradesmen common to a large centre.

Petrol and Petroleum

Petrocongo possesses a tetra-ethyl lead-blending plant, and by agreement with the Ethyl Corporation has the sales' monopoly for Belgian Congo as well as for French Equatorial Africa and Angola. 11,000 imperial gallons per day can be produced. The same company makes petrol storage drums and has produced annually 250,000 drums of 44 gallons and 60,000 drums of 11·8, 7·9, and 3·9 gallons.

For the supply of petroleum and petrol upstream from Leopoldville a train of barges leaves once a month. The transport of 110,000 imperial gallons per month can be relied on, and the organization exists for the eventual distribution of this quantity wherever required in the north-eastern Congo.

For imports of petroleum, *see* Ango Ango (p. 316). For petrol tanks, including barges and railway tank wagons, *see* p. 329.

Shipping

According to available and probably incomplete reports, the total number of river craft on the middle Congo and its tributaries was, in 1940, 109 steamers, 37 tugs, 316 barges, and 191 smaller craft. The total tonnage exceeded 100,000 tons. Existing reports give no indication as to the number of barges owned by the French fleets on the Ubangi river or the considerable number of small craft owned by private individuals. The tonnage figure is an estimate, no complete information on gross and net tonnage or carrying capacity being available. There are at least six fleets operating on the Congo river system.

(1) *The Otraco Fleet.* Otraco has the largest single fleet on the Congo and maintains regular passenger and traffic services to all important points. The composition of this fleet in 1940 was as follows:

				Tons					
Under 20	*20–35*	*35–145*	*145–245*	*245–490*	*Over 490*	*Over 980*	*Total*	*Large tugs*	*Small tugs*
9	10	9	4	3	4	3	42	11	25

According to the Director-General of Otraco, the total (unqualified) tonnage of the fleet in December 1941 was 66,165 tons, not including units under construction.

The goods traffic of Otraco during 1935–1937 was:

	Imperial tons		
	1935	*1936*	*1937*
Upstream . .	61,179	97,288	133,083
Down ,, . .	173,152	191,880	249,787
TOTAL .	234,331	289,168	382,870

The passenger traffic during 1934–1936 was:

	1934	*1935*	*1936*
Upstream . .	8,325	12,115	8,981
Down ,, . .	9,214	12,227	8,430
TOTAL .	17,539	24,342	17,411

(2) *Huileries du Congo Belge* (*H.C.B. or Huilever*) *Fleet.* The Huilever fleet is employed primarily in the transportation of palm-oil products, although its steamers are capable of carrying some passengers and general cargo. According to the only data available, in July 1942, the Huilever fleet comprised 38 steamers with a gross tonnage of about 9,840 tons and a net tonnage of about 4,920 tons. This does not include barges and smaller craft, the number of which must be considerable.

(3) *Compagnie des Cultures Fleet.* According to available data this comprises 18 small steamers, 1 motor-boat, and 2 barges.

(4–5) *French Fleets on the Ubangi River.* There are two French fleets which carry passengers and cargo between Brazzaville and ports on the Ubangi river. The Compagnie Générale des Transports Africains has eight steamers. These steamers usually operate with two towed barges. The total carrying capacity of these steamers and barges has been estimated at 2,310 tons. The Compagnie France-Congo has one steamer of about 500 tons. No other information on tugs, barges, and smaller craft is available.

(6) *The Service des Voies Navigables.* The Government of the Belgian Congo maintains a separate fleet upon the Congo and its tributaries to inspect the navigable channel, place buoys, beacons, and other signals, and conduct hydrographic surveys. This fleet comprises 2 small steamers, 1 snag-boat, 2 dredgers, 1 tug, 10 buoy-layers, and some smaller craft. This fleet could not be diverted to any other use, since all traffic on the Congo system depends upon the hydrographic work performed by its units.

Barges

The flotilla of barges based on Leopoldville comprises 44 barges with a net tonnage of about 8,170 tons.

Local Industries

Shipyards

(1) Chanic. Specializes in the construction of steamers, tugs, barges, bridges, and other iron and steel construction. The firm builds tugs of 850 h.p. and 428 tons deadweight, and lighters of 984 tons capacity and 295 tons deadweight. 150 pneumatic riveters can work simultaneously, and 1,200 men can be employed. The firm has also an oxygen and acetylene producing plant, and a well-equipped Ford agency and garage. Since the outbreak of war in 1939 Chanic has been manufacturing hatchets, shovels, axes, and castings for mining and agricultural companies which are cut off from European supplies. It has built machine-gun mountings, mess tins, and truck bodies for Fighting French and Congo forces.

(2) Otraco employed 43 Europeans and 750 natives in 1940. Every two years it overhauls three-quarters of the Otraco fleet of steamers and barges. The shipyard has its own light railway and is also connected with the main railway. Electricity is obtained from the Colectric company and a 450-kW. substation.

(3) The H.C.B. or Huilever firm owns the following shops: blacksmiths', foundry and pattern, carpenters', fitting and machine, and platers'. All these shops are well equipped with power-driven machinery.

(4) Atena. All information available has already been given under 'Lifting Facilities', 'Warehouses', and 'Port Facilities'.

Electric Light and Power

There are seven firms, of which the chief is the Société Coloniale d'Électricité (Colectric). It derives its current from Sanga power station, about 40 miles south-west of Leopoldville. The output of this station greatly exceeds the requirements of Leopoldville, and in 1937 an under-water cable was laid across the Congo to supply Brazzaville.

Brewery

The manufacture of beer by the Brasserie de Leopoldville for 1936–1937 was:

Imperial gallons	
1936	*1937*
179,080	232,320

Textiles

There is a large cotton mill at Leopoldville—the only one in the

Belgian Congo. This mill has recently been extended and has been made almost self-sufficient by setting up machine-shops to cast, finish, and repair loom parts. Between 11,000,000 and 13,000,000 yards of cotton cloth were woven in Leopoldville in 1937.

Various

There are soap-makers, brickfields, and mineral water manufacturers.

Communications

River

Aketi (Port Chaltin), 1,004 miles.
Stanleyville, 1,075 miles.
Port Francqui, 526 miles.

Roads

N. Across Stanley Pool it is connected with French Equatorial Africa.

S. To the south it is connected by road with Maquela do Zombo and Angola.

S.S.W. To Thysville.

Rail

Matadi (232 miles).

2. STANLEYVILLE

Lat. 0° 32′ N., long. 25° 13′. Altitude 1,400 feet. Population (estimated) 10,000. Hospitals. Hotels. Cinema. Garages.

SITE (Fig. 55)

Stanleyville is situated at the limit of navigation on the middle Congo, roughly 1,000 miles above Leopoldville and at the foot of the rapids known as Stanley Falls. It has two ports, one on each bank of the river. On the south bank is the railway quay, connected with the rail and river route to Katanga and Lake Tanganyika. A new port is under construction on this bank. The Otraco quay is on the north bank, with road connections to the Sudan, Uganda, and lakes Albert and Kivu. A serious obstacle to the unloading of large quantities of supplies at Stanleyville lies in the position of its main avenue,

which is alongside the Otraco quay (and its possible extension) and very close to the bank. This also limits the extension of the port. Next to the quay, on this side, the shore consists of sandy beaches.

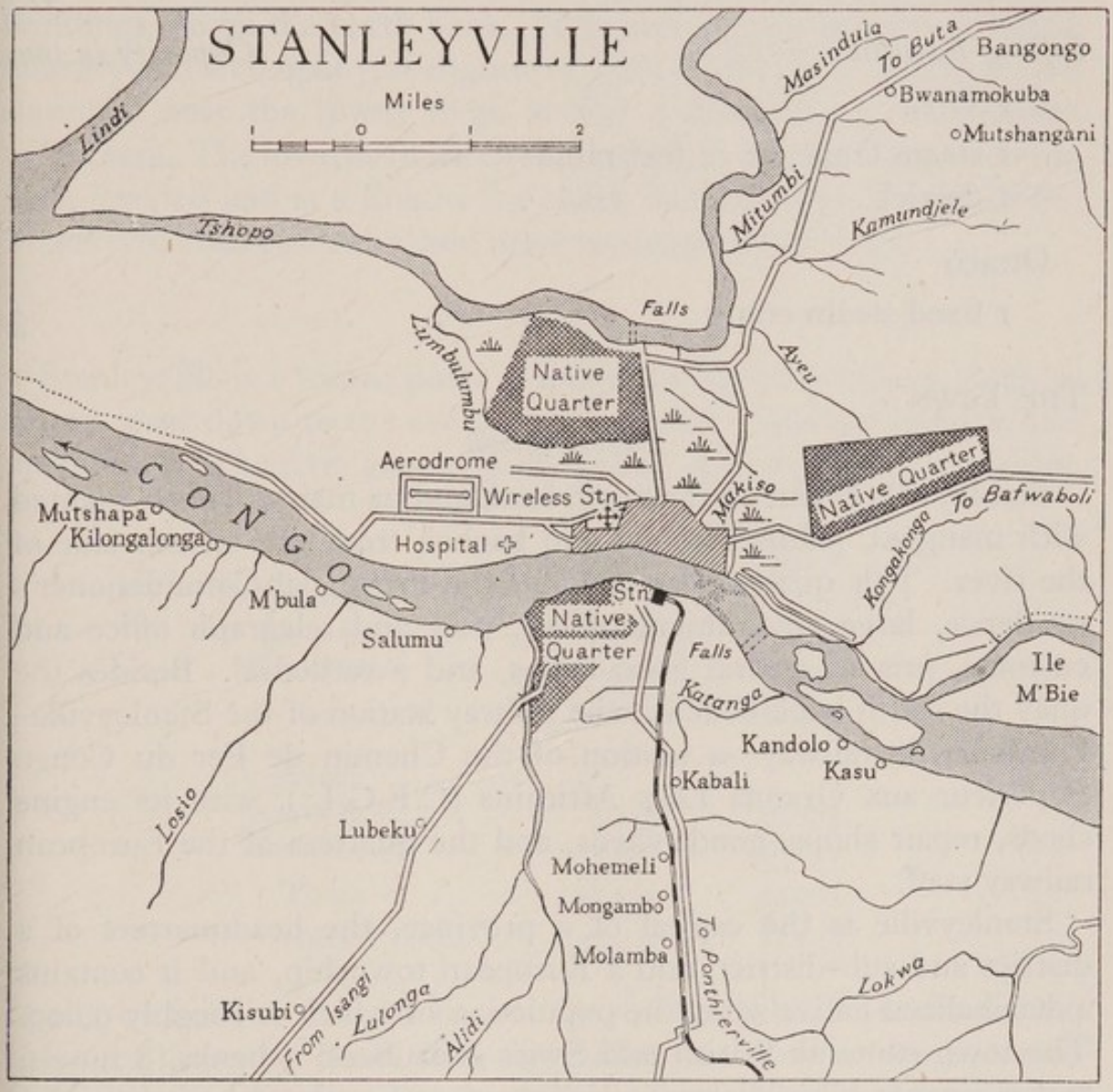


FIG. 55. *Stanleyville*

DETAILED DESCRIPTION

Summary

Depths

The draught of steamers on the Congo, between Stanleyville and Leopoldville, should not exceed 5·9 feet. Occasionally a draught of 6·6 feet is permissible, but this is not safe all the year round. At the Pool the Congo is lowest in June–July: in October the water begins to rise and is highest in January. The channels are buoyed, and 850-ton barges can approach Stanleyville at all waters.

Quays

Total Lengths	*Feet*
C.F.G.L.	524
Otraco	476

Lifting Facilities	*Capacity in tons*
C.F.G.L.	
1 steam crane, at 52 feet radius	3
1 derrick	20
Otraco	
1 fixed steam crane	3

THE TOWN

Description

Stanleyville began on the north bank and its main avenues, planted with mangoes, palms, almond and baobab trees, are on this side of the river. This quarter also contains the Provincial Commissioner's residence, large government offices, post and telegraph office and customs, prison, several good shops, and a cathedral. Besides the quay the south bank contains the railway station of the Stanleyville–Ponthierville railway—a section of the Chemin de Fer du Congo Supérieur aux Grands Lacs Africains (C.F.G.L.), with its engine sheds, repair shops, goods sheds, and the quarters of the European railway staff.

Stanleyville is the capital of a province, the headquarters of a district and sub-district, and a European township, and it contains a detribalized native zone, the population of which is roughly 9,600. The town contains British and Swiss consulates, 3 banks, 8 hotels, and a cinema (Ciné-Palace). European and native hospitals and a government dispensary care for the sick. Research is furthered by biochemical laboratories and medical education by a school for native *infirmiers*. The courts comprise Police Court, District Court, Parquet Court, Court of First Instance, and Military Court; there are two practising avocats.

Stanleyville is the seat of a Vicar Apostolic. The mission station of the Prêtres du Sacré Cœur, at St. Gabriel-des-Falls, lies at the end of a promenade running westward along the north bank: the Marist Brothers have a printing-press. The town is the educational centre for the eastern Congo. The system of evening schools has been especially developed. According to recent information the schools

are attended by more than 60 per cent. of the native working population. Besides elementary and secondary schools there are technical schools of various descriptions. A school for very young European children is maintained at the Franciscan convent. Most of the public buildings are on the north bank. In peace-time a company of native infantry and a company of engineers, both of the Force Publique, are stationed near the town: there is also a detachment of European volunteers. The town has a wireless telegraphic station. An airfield has been levelled and is a link in the chain, Leopoldville–Elisabethville. Stanleyville has electricity and a government water-supply.

Trade

Stanleyville is a transit port. Through it native products, such as cotton, pass down to the coast and European manufactures are sent up country. The river goods traffic during 1936–1937 was as follows:

	Imperial tons	
	1936	*1937*
Down-stream		
North bank . .	3,972	4,598
South bank .	28,703	32,827
TOTAL . .	32,675	37,425
Up-stream		
North bank . .	8,619	16,575
South bank . .	16,921	28,649
TOTAL . .	25,540	45,224
GRAND TOTAL .	58,215	82,649

It will be noticed that the figures for the south bank greatly exceed those for the north bank. The figures for the south bank agree with the railway returns (*see* 'Ponthierville', p. 341), that is, they relate to goods in transit. Some of the goods handled on the north bank are also in transit. Thus goods in transit considerably exceed those dispatched from or destined for the population of Stanleyville.

Banks comprise offices of the Banque Belge d'Afrique, Banque Commerciale du Congo, and Banque du Congo Belge. In the commercial centre are numerous stores and trading concerns which are in the hands of Belgian, British, French, Portuguese, Greek, and Indian firms, who have a Chamber of Commerce. British firms are represented by Messrs. G. B. Ollivant & Co. Ltd., and French by the C.F.A.O. Eight gold-mining companies have their head offices in Stanleyville.

Petrol

There is a depot on the north bank, which is one of the principal depots in the colony where stocks of petrol are kept in drums. Stanleyville also has two petrol tanks, each of 22,000 gallons (70 tons) capacity. Eastwards from Stanleyville distribution is made by seven petrol-tank lorries, each of 1,095 gallons capacity.

Shipping

A thousand miles of clear waterway lie between Leopoldville and Stanleyville and a good portion of the Leopoldville river shipping plies between the ports. The only particulars available are those of the goods handled on the north bank. These have been given under the subhead of 'Trade'.

Local Industries

Half a dozen companies managing coffee and other plantations, or which are interested in timber production, have their head offices in Stanleyville. There are saw-mills, rice mills, and soap-works, as well as a European bakery and an ice factory.

Communications

River

Leopoldville (1,075 miles).

Road

N. Buta (210 miles).
E. Irumu (400 miles).

Railway

Ponthierville (78 miles).

3. PONTHIERVILLE

Lat. 0° 21′ S., long. 25° 30′. Altitude 1,542 feet.

SITE

As regards installations, Ponthierville does not come up to the definition of a river port; yet, as a place at which goods are transhipped from river to rail and from rail to river, and not used merely for loading and unloading goods conveyed by river steamers, it

deserves mention. It lies on the left bank of the Lualaba, just above the highest of the series of cataracts extending over a curving stretch of 60 miles and known as the Stanley Falls. It is, therefore, the northern terminus of the Lualaba river navigation and, by the construction of the 'Falls Railway', it is connected with Stanleyville and the head of the Congo navigation. The line comes down to the water's edge at high river.

Detailed Description

Port Facilities

Railway workshop.
Ship-repairing yard.

The Town

The township of Ponthierville is named after a gallant Belgian officer who died in warfare against the Arabs. It lies in the sub-district, district, and province of Stanleyville. Besides the administrative and post and telegraph offices and railway buildings there is a mission station of the Fathers of the Sacred Heart nearby.

Trade

The commercial quarter contains about ten European and Asiatic stores. The railway traffic was 45,624 tons in 1936 and 61,476 tons in 1937.

These goods were in transit.

Shipping

There are no details of river craft between Ponthierville and Kindu.

Communications

River

S. Kindu (198 miles).

Road

None.

Railway

N. Stanleyville (78 miles).

4. KINDU

Lat. 2° 59′ S., long. 25° 56′. Altitude 1,800 feet. Hotels. Native hospital. Garage.

Site

Kindu, like Ponthierville, is worthy of mention, not because it is a fully equipped river port, but because it is a place of transhipment

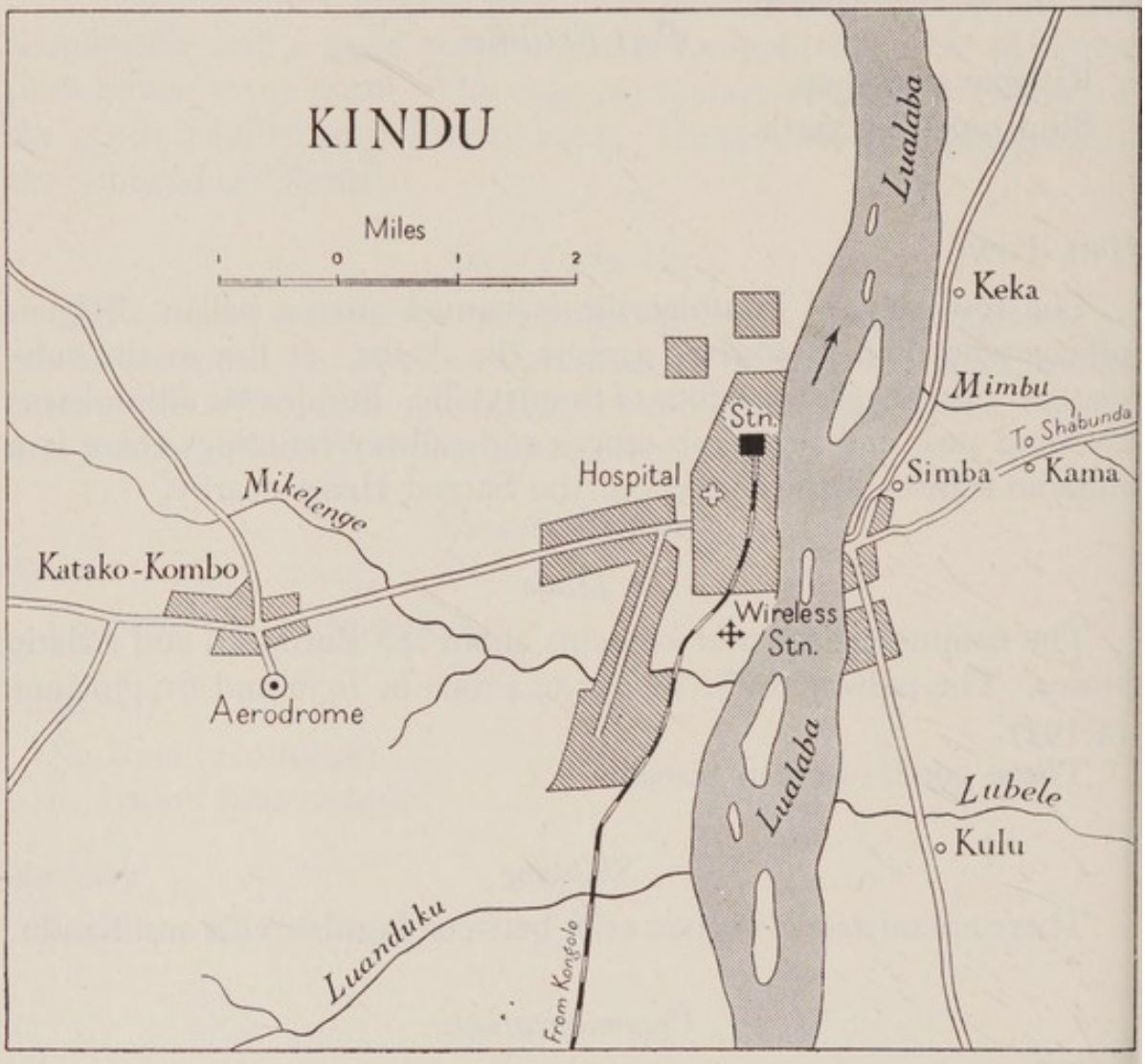


FIG. 56. *Kindu*

between rail and river. It lies on the left bank of the Lualaba, at the head of the Lowa reach of the river, which is unnavigable for most of the 200 miles above this point. The rapids are by-passed by the Manyema railway, a section of the Great Lakes railway, which connects Kindu with Kongolo.

Detailed Description

Port Facilities

The railway company (Chemin de Fer du Congo Supérieur aux Grands Lacs Africains) maintains repair shops at Kindu, in which repairs can be carried out to steamers as well as to locomotives and rolling-stock.

The Town

Description

Kindu is a township and the headquarters of the Kindu sub-district of the district of Manyema, in the Costermansville province. It contains government offices, railway buildings, police court, wireless station, garage, and two hotels (de l'Oasis and Moderne). Kindu is on the Sabena air route, and there is an airfield 4½ miles outside the town. The detribalized zone of Kindu, in 1937, had a population of 7,150. The Fathers of the Holy Ghost have a mission station.

Trade

Kindu has two banks—Banque du Congo Belge and Banque Commerciale du Congo. The commercial quarter is extensive for this part of the colony and contains general trading stores managed by European and Asiatic firms. Several gold-mining companies which operate in this region have their offices here. The Comptoir Colonial Belgika runs a cotton ginnery and a rice mill nearby. There is another rice mill and a garage. For railway traffic, *see* Kongolo.

Shipping

See Ponthierville.

Communications

River

N. Ponthierville (198 miles).

Road

N. Lokandu (39 miles).

Railway

S. Kongolo (221 miles); Kabalo (274 miles); Albertville (444 miles).

5. KONGOLO

Lat. 5° 22′ S., long. 27° 00′. Altitude 1,885 feet. Hospitals. Hotel.

Site

Kongolo lies on the west bank of the upper Congo or Lualaba, 140 miles directly west of Lake Tanganyika. Above it, the river is navigable to Bukama. Below it, the Portes d'Enfer and other rapids stop most navigation south of Kindu. A railway connects it with Kindu, and some little distance up-stream a 1,640-foot road and rail bridge spans the Lualaba and links it with Kabalo. The bank is steep-to, and the harbour is well constructed and connected to adequate railway marshalling yards.

Detailed Description

Depths

An adequate depth of water is always maintained by a dredger.

Quay	*Feet*
Total Length	950
or, including ramps	1,500

Lifting Facilities	*Capacity in tons*
1 stationary electric crane	20
2 travelling steam cranes	3

Warehouses

There are some large stores and warehouses, but particulars are not available.

Port Facilities

Slipways

Two 150-foot patent slipways, one operated electrically, the other by steam, to enable boats to be repaired.

Repairs

Well-equipped workshops with electric and oxy-acetylene welding plants and foundry. River steamers and barges are repaired and alterations carried out by skilled native labour under European supervision.

Stores

Some shipping stores are available.

THE TOWN

Description

The amenities of this small township include electric lighting, water-supply, hotel, two banks, European and native hospitals, and post and telegraph office. The railway yard with its sheds is prominent. The town is the headquarters of a sub-district of the district of Tanganika, in the Elisabethville province, and contains government offices and local courts. The Mission of the Fathers of the Holy Ghost is well established and is the residence of a vicar apostolic. To the south, the aerials of the wireless station are visible, and 'planes of the Sabena air service sometimes alight at the emergency landing-ground. There is also a military training camp, with accommodation for 600 recruits.

Trade

Kongolo is a transit port, and the main trade is the goods traffic by river and by rail. During 1936 the railway goods traffic was 43,374 tons. For river goods traffic see Bukama. Half a dozen general stores are run by Belgians, Greeks, and Portuguese, and the Banque du Congo Belge and Banque Commerciale du Congo provide banking facilities.

Petrol

Petrol is stocked, but no particulars are available.

Shipping

River shipping is managed by Otraco.

Local Industries

This is cotton-growing country, and the Société Cotonnière du Tanganika (Cotanga) has set up a ginnery. Brick-making is carried on at the mission, and there is a bakery in the town.

Communications

River

S. Kabalo (46 miles). Bukama (387 miles).

Road

N. Kasongo (135 miles).
SSW. Kabongo (235 miles).
W. Ebombo corner (80 miles).

Railway

N. Kindu (221 miles).
S. Kabalo (53 miles).

6. KABALO

Lat. 6° 06′ S., long. 26° 53′. Altitude 1,950 feet. Native hospital.

SITE (Fig. 57).

This small river port stands where the railway from Lake Tanganyika meets the Lualaba. The port, as well as the station, is on the east bank and consists of a quay with concrete ramps for the various levels of the river, and equipped with sidings. There is railway connexion with Kongolo down-stream, to the north, and east to

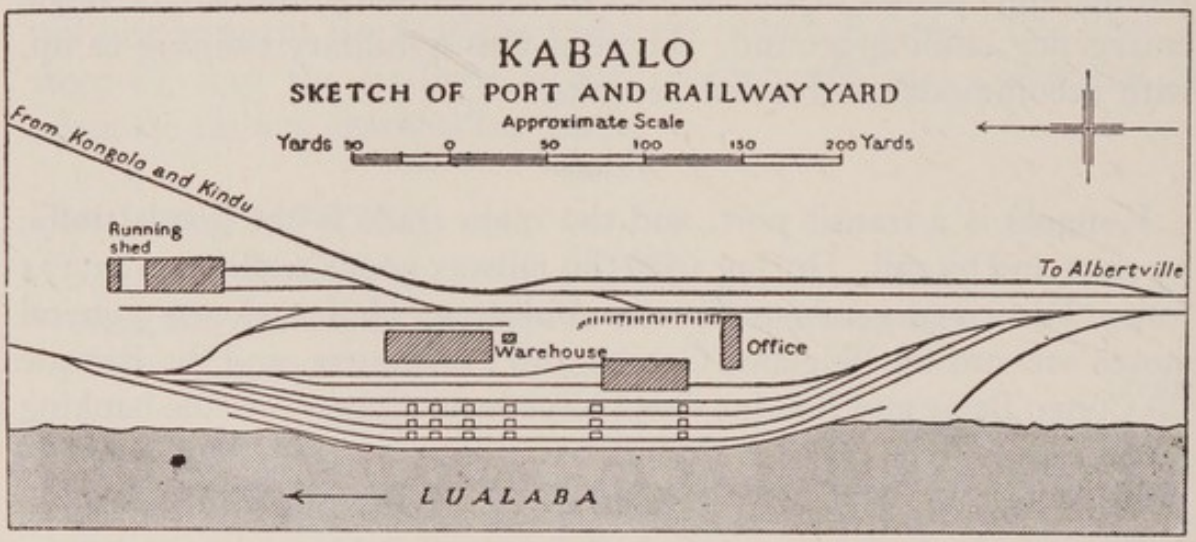


FIG. 57. *Kabalo*

Albertville on the lake. The banks are swampy and infested with mosquitoes.

DETAILED DESCRIPTION

Depths

Depth of water alongside always adequate for boats. *See* Kongolo.

Quay	*Feet*
Total Length	518

Lifting Facilities	*Capacity in tons*
2 steam cranes	5
1 steam crane	3

Light cargo is manhandled by natives.

Warehouses

1 railway warehouse, approximately 160 ft. × 50 ft.
1 „ „ „ 130 ft. × 50 ft.

Port Facilities

No special facilities.

The Town

Description

Kabalo is a township in the sub-district of Kongolo, Tanganika district, Elisabethville province. The buildings comprise administrator's office, river police station, police court, railway premises and government quarters, a few shops, and post and telephone offices. Accommodation for 50 officers and non-commissioned officers is possible in the village, and a warehouse might shelter 250 men. The village is infested with mosquitoes and tsetse-fly. The White Fathers and the English Garanganze Mission have stations near. Two miles from the post there is an airfield used by Sabena.

Trade

Transit traffic passes through Kabalo by river and rail. The Société Internationale Forestière et Minière du Congo (Forminière) has established a transit post here. The Government holds half the capital of this organization; the rest comes from Belgium and America. The goods traffic by rail between Kabalo and Albertville was 25,879 tons in 1936, and 36,823 in 1937.

Cotton and coffee are shipped: their production comes under the head of industries. There are half a dozen trading firms and a few native stores.

Petrol

Some petrol is stocked.

Shipping

In normal times there is a regular fortnightly service between Kabalo and Bukama with the addition of further services according to requirements.

Local Industries

Cotton-growing is the main industry. Coffee is cultivated at Katompe, 30 miles to the west. There is a goldfield in the valley of the Lukuga, and a gold-mining company, the Société des Recherches et d'Exploitations Aurifères au Katanga (Sorekat), is established at Nyunzu, half-way down the Albertville railway line.

Communications

River

N. Kongolo (46 miles).
S. Bukama (341 miles).

Road

W. Kabinda (316 miles).

Railway

N. Kongolo (53 miles), Kindu (274 miles).
E. Albertville (170 miles).

Note. Cranes can discharge from boats into trucks at all states of the river. This has been accomplished by constructing a series of broad steps from the surface of the ground down to the level of the lowest water. These steps are broad enough to take a line of rails on which a crane may run, and as the risers of the steps are parallel to the river, the difficulties imposed by a fluctuating river have been overcome. There is an adequate marshalling yard in conjunction with the harbour, with a loading ramp, but no built-up platform.

7. BUKAMA

Lat. 9° 10′ S., long. 25° 50′. Altitude 1,886 feet. Hospital. Hotels.

SITE (Fig. 58).

This is the head of steam navigation on the Lualaba-Congo. The river flows sluggishly between bare banks, 200 yards apart. The railway from Elisabethville to Port Francqui crosses the river and a sideline leads to the eastern bank, 300 yards below the bridge, where a quay has been built. Portions of the bank, north of the quay, could be used with little work as further wharfage. A little above the bridge a ferry, which can transport 10 tons, links the converging roads from Bukama and Kamina. The western bank is low and liable to flooding.

DETAILED DESCRIPTION

Depths

Approach

The depth of the waterway varies according to the season. It is, however, reported to be always deep enough to allow the passage of local river craft for at least about 8½ months in the year.

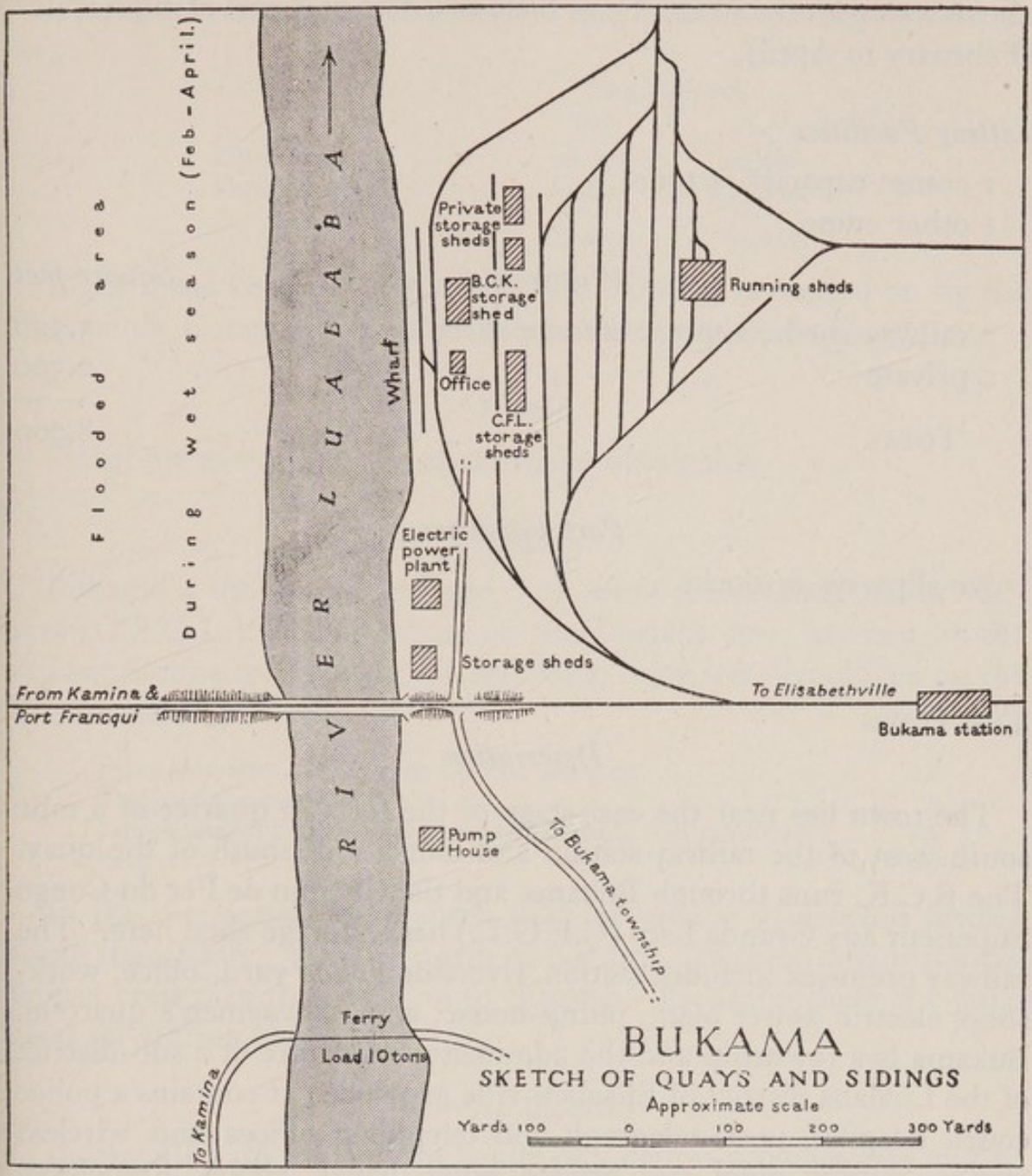


FIG. 58. *Bukama*

Quay

There is always sufficient water alongside the quay to float any of the units in the river.

Quay

	Feet
Total Length	650

The elevation of the wharf above water-level depends upon the season. At low water (July to September) it is approximately 20 feet

above water-level and can be as little as 4 feet or 5 feet at high water (February to April).

Lifting Facilities

1 crane: capacity, 4 tons.
1 other crane.

	Warehouses	*Square feet*
2 railway sheds, approx. storage space	. . .	5,500
2 private ,, ,, ,,	. . .	2,500
TOTAL	. . .	8,000

Port Facilities

No slipways or docks.

THE TOWN

Description

The town lies near the east stage of the ferry, a quarter of a mile south-west of the railway station and half a mile south of the quay. The B.C.K. runs through Bukama and the Chemin de Fer du Congo Supérieur aux Grands Lacs (C.F.G.L.) has a storage shed here. The railway premises includes station, riverside goods yard, office, workshop, electric power plant, pump-house, and railwaymen's quarters. Bukama is a township and the administrative centre of a sub-district of the Lualaba district of Elisabethville province. It contains a police court, hospital, post, telegraph and telephone offices and wireless station, railway hotel and private hotel, banks, shops, Franciscan Mission, and airfield on the Sabena route.

Trade

Bukama is a large commercial centre. For the period 1935–1937 the railway goods traffic between Bukama and Sakania was as follows:

	Imperial tons	
1935	*1936*	*1937*
1,292,275	1,318,375	2,680,000

For the goods traffic between Bukama and Port Francqui, *see* Port Francqui (p. 356).

The river traffic between Kongolo and Bukama during 1936–1937 was:

	Imperial tons	
	1936	*1937*
Up-stream . .	28,621	29,406
Down-stream . .	44,823	35,830
TOTAL . .	73,444	65,236

Eight firms keep general stores, and banking is carried on by the Banque du Congo Belge and Banque Commerciale du Congo.

Petrol

Petrol for motor vehicles is normally obtainable.

Shipping

Bukama is the terminus of the river route of the Great Lakes Railway (C.F.G.L.). The services on the Lualaba river are run by the railway company. In 1931 the following units were employed on the Bukama–Kongolo section:—

Stern-wheelers, of between 60 and 300 tons	11
Tugs, of 250 tons	2
Longboats and steam launches, whaleboats, and pontoons .	22
Barges	29

In the dry season larger craft may be unable to proceed farther south than Kiabo, 52 miles north of Bukama. In these circumstances lighter craft take the cargo on to Bukama. At Kiabo there is a large shed for storing cargo.

Local Industries

Bukama lies on the eastern fringe of a cotton-growing area and to the west of a tin-field. Coal-mining is carried on at Luena, 21 miles to the south, and the Compagnie d'Élevage et d'Alimentation du Katanga breeds cattle.

Communications

River

Kongolo (387 miles).

Road

N. Kabongo (179 miles); Rutshuru (1,079 miles) and Uganda.
SE. Elisabethville (296 miles); Livingstone (695 miles) and beyond.
NW. Port Francqui (700 miles approx.).

Railway

NW. Port Francqui (698 miles).

SE. Elisabethville (284 miles); Buluwayo; Kimberley; Capetown (2,600 miles): Salisbury; Beira.

W. Tenke junction; Lobito Bay (1,286 miles).

8. AKETI

Lat. 2° 42′ N., long. 23° 50′. Hotel. Cinema.

SITE

Aketi or Port Chaltin is a river and rail terminus. It is situated on the left bank of the river Itimbiri or Rubi and marks the limit of uninterrupted navigation from Stanley Pool: narrow-gauge railways from the north and the east converge at Komba junction, 19 miles distant.

DETAILED DESCRIPTION

Depths

The Itimbiri is always open to navigation, but only vessels drawing under 3·3 feet can pass at the lowest water.

Quays

Total Length	*Feet*
Quay	820

Petrol wharf (no details).

Lifting Facilities	*Capacity in tons*
1 electric derrick	15
1 „ crane	5
4 „ cranes	1·25

At the adjacent petrol wharf there is another electric crane of 1·23 tons capacity.

Warehouses

4 transit sheds.

1 warehouse for general merchandise.

No information as to capacity is available.

Port Facilities

No docks or slipways.

THE TOWN

Description

Aketi is the headquarters of a sub-district of Uele district in Stanleyville province and a township. It has a railway station and repair shops, post and telegraph office, offices of Otraco and of the river police, some stores, two banks, railway hotel—Hotel Mabinza—cinema, electric light, European and native hospitals, and a Mission of the Premonstratensian Fathers.

Trade

Aketi taps the trade of the Uele and of the agricultural district to the east. It is a transit port. The river goods traffic for 1936–1937 and 1939 amounted to

	Imperial tons		
	1936	*1937*	*1939*
Up-stream . .	15,629	20,664	18,652
Down-stream .	29,711	31,488	28,460
TOTAL .	45,340	52,152	47,112

During the period 1936–1937 the railway company (Vicicongo) transported:

	Imperial tons	
	1936	*1937*
By rail .	45,355	54,924
By road .	59,589	67,459
TOTAL	104,944	122,383

The town contains nine trading stores and branches of the Banque Commerciale du Congo and Banque du Congo Belge.

Petrol

There are two petrol tanks, each containing 55,000 imperial gallons, or 175 tons.

Shipping

Aketi is served by the shipping of the middle Congo. Traffic from Leopoldville to Aketi leaves the Congo above Bumba, ascending the Itimbiri to Aketi. The usual procedure is for barges destined for Aketi to be detached at Bumba, where they are picked up by smaller steamers or tugs and towed to Aketi.

Local Industries

Aketi stands in a rice-growing district. There are coffee plantations nearby, and the Compagnie Cotonnière Congolaise has a ginnery.

Communications

River

Leopoldville (1,004 miles).

Road

E. Buta (78 miles); Juba, on the Nile (695 miles). 'The Route Royale.'

S. Stanleyville, via Buta (288 miles).

Railway (Chemins de Fer Vicinaux du Congo, or 'Vicicongo')

N. Bondo (98 miles).

E. Mungbere (426 miles).

9. PORT FRANCQUI (ILEBO)

Lat. 4° 19′ S., long. 20° 37′. Altitude 1,160 feet. Hotel. Hospital. Population (estimated) 3,000.

SITE (Fig. 59)

The direct route from the industrial area of Elisabethville to Leopoldville is by B.C.K. railway to Port Francqui. The line descends from the plateau, between the Kasai and the Sankuru, and terminates in the fork, 12 miles above the confluence. The journey is continued by steamer down river.

The port lies on the north bank of the Kasai, where the river forms a pool 3 miles long and over a mile wide. Two islands split the current. Shifting sandbanks tend to deflect the greater part of the river's discharge to the south bank. To counteract this and drive the current into the north channel, a barrage has been built out obliquely from the south bank, above the port. Dredgers are also used to maintain the depth required at the quay.

The north bank is cut by the mouth of the stream Lutshwadi. The banks of this river, especially the west, are swampy. The port lies at the foot of the high ground between the south bank of the Lutshwadi and the Kasai. It comprises a quay connected to the railway, repair shop, explosives magazine, electrical power house, and other amenities which will be mentioned later.

DETAILED DESCRIPTION (Fig. 60)

Depths

Approach

At all times of the year a depth of 4 feet will be found in the navigable channel. For eight months of the year vessels drawing more than

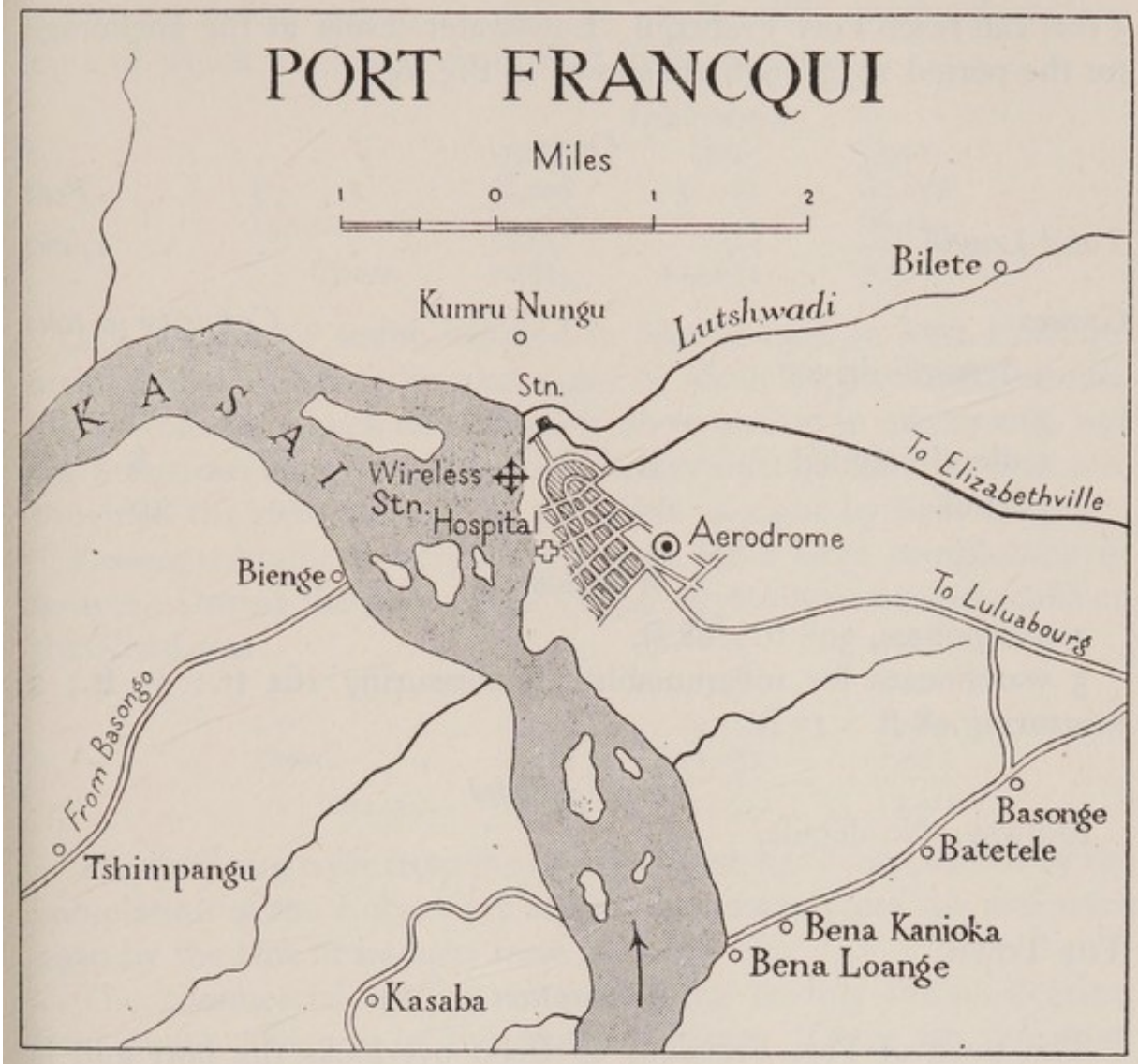


FIG. 59. *Port Francqui*

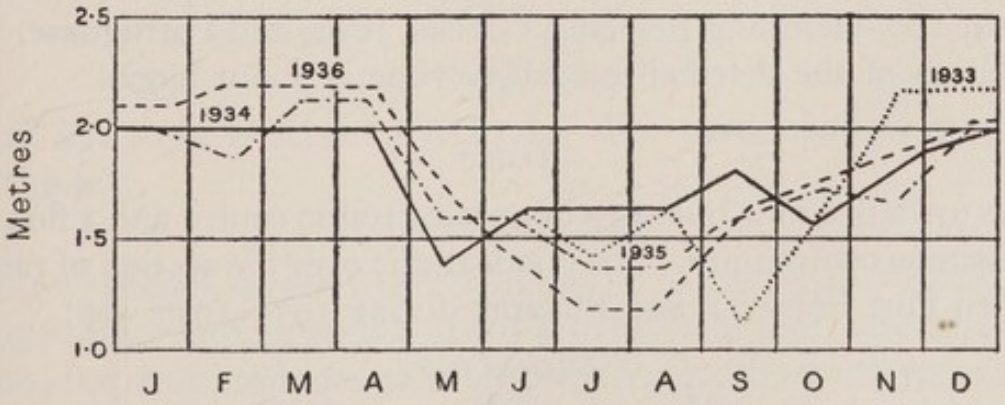


FIG. 60. *Port Francqui. Low-water levels at the anchorage*

5 feet can reach Port Francqui. Low-water levels at the anchorage for the period 1933–1936 are shown in Fig. 60.

Quay

	Feet
Total Length	1,660

Cranes	*Capacity in tons*
3 dynamo-driven	3
1 ,, ...	6
1 diesel-engined	8
1 hand	10

Warehouses

2 warehouses, 308 ft. × 68 ft.

5 warehouses for inflammables, 3 measuring 164 ft. × 17 ft.; 2 measuring 98 ft. × 17 ft.

Port Facilities

Slipway. No details.

The Town

Description

The town of Port Francqui or Ilebo overlooks the port and is well laid out. As a township in Bakuba sub-district of Kasai district in Lusambo province it contains administrative offices, River Police station, notarial chambers, post and telegraph office, wireless station, native hospital, trading stores, and banks. The amenities include a luxurious railway hotel—the Grand Hôtel des Palmes—managed by the Compagnie Internationale des Wagon-Lits. An airfield, on the Sabena route, adjoins the town. Its normal European population is about 100, including Belgians, Greeks, Jews, and Portuguese. The population of the detribalized native zone is about 2,900.

Trade

The town is a new but very important traffic centre and a flourishing business community. The goods traffic over the section of railway between Port Francqui and Bukama during 1935–1937 was:

Imperial tons

1935	*1936*	*1937*
197,313	181,646	272,968

During the period 1934–1936 the goods traffic on the Kasai, the bulk of which went to or from Port Francqui, was:

	Imperial tons		
	1934	*1935*	*1936*
Up . .	18,006	31,729	40,817
Down .	74,579	83,152	66,524
TOTAL .	92,585	114,881	107,341

The volume of traffic handled in March 1942 in Port Francqui amounted to about 1,180 tons a day or about 29,500 tons a month. 39,300 tons have been carried up or down stream in one month, and the numerous barges and tugs could carry over 98,000 tons a month, provided the river were made navigable at night by light buoys.

Passenger traffic is very slack except for a large complement of natives. During the same period (1934–1936) the passenger traffic on the Kasai was:

	1934	*1935*	*1936*
Up . .	8,325	12,115	8,981
Down .	9,214	12,227	8,430
TOTAL .	17,539	24,342	17,411

The traffic up river from the Congo mouth has been affected by the completion of the Lobito bay railway line some years ago and since 1939 by the lack of imports from Europe.

The commercial quarter contains nine trading firms—Belgian, Portuguese, and one or two South African. There are European building contractors. The town possesses two banks—Banque Commerciale du Congo and Banque du Congo Belge—and an office of Otraco.

Petrol and Petroleum

The provision of a *parc aux inflammables* containing five warehouses, at the mouth of the Lutshwadi, indicates that quantities of inflammable goods are stored, but no particulars are available.

Shipping

Port Francqui is served by Otraco. For particulars of the traffic, *see* 'Trade'.

Local Industries

Port Francqui serves many regions. To the north stretches the Great Forest, with its wealth of copal to be collected. The east grows cotton; the west produces palm oil and kernels; the south some fibres. Up river lie the rich diamond fields. The Compagnie du Lubilash

are planters and stock-farmers in the neighbourhood. In the town itself the B.C.K. produces electricity. One of the firms runs a mill, and there is a brick-field.

Communications

River

Leopoldville (526 miles).

Road

A motor-road runs south-eastward to Bukama (700 miles approx.), usually parallel to and continuous with the railway.

Railway

Bukama (698 miles); Elisabethville (982 miles).

III. LAKE PORTS

1. ALBERTVILLE

Lat. 5° 56′ S., long. 29° 13′. Altitude 2,535 feet. Hotel. Hospitals. Garages.

SITE

Albertville lies midway along the western shore of Lake Tanganyika, south of the end of the valley of the unnavigable Lukuga, which joins the river Lualaba 170 miles to the west. The railway follows, more or less, the course of the Lukuga. Lake Tanganyika provides easy water transport for a distance of 450 miles from end to end. At Albertville it is 50 miles wide: Kigoma, the ferry-port and terminus of the Tanganyika railway from Dar-es-Salaam, lies on the opposite shore, farther to the north, and is about 80–90 miles distant. Uvira and Usumbura lie at the north end of the lake and Mpulungu and Vua at the south.

The port is built on the point of land which forms the southern extremity of Lukuga bay, about 2 miles east-south-east of the place where the Lukuga river leaves the lake, and immediately to the north of the mouth of a small stream—the Kalemie. The harbour is protected by a sea-wall which projects 380 yards into the lake. A pier of reinforced concrete is joined to this wall.

Detailed Description

Depths

Vessels may be moored alongside the pier. The largest Belgian railway steamer is of 340 tons and the largest Tanganyika railway steamer is of 700 tons (S.S. *Liemba*).

Quays

Total Length	*Feet*
Pier	1,253

Lifting Facilities	*Tons*
2 steam cranes, capacity	3
1, or 2 ,, ,,	5

Warehouses

Large railway storage sheds. No particulars.

Port Facilities

1 dry dock, 360 feet × 59 feet.

The Town

Description

Albertville is the chief port on the western shore of Lake Tanganyika and is the administrative centre of the district of Tanganyika, as well as of the sub-district of Albertville, in Elisabethville province. The hills rise fairly steeply to a height of 2,000–5,000 feet, and the town is built on a hill-side overlooking the lake. The port was constructed during the War of 1914–1918 and the town is therefore fairly recent. There are the usual administrative buildings and courts, treasury, custom-house, post and telegraph office, telephone exchange, wireless station, two hospitals, and primary school for European children. It is the terminus of the Great Lakes Railway (C.F.G.L.) and contains a marshalling yard and railway and marine workshops. Other buildings include shops, offices, banks, and an hotel—(Hotel du Lac). The White Fathers have a station at Albertville; so has the Garanganze Evangelical Mission.

Trade

Albertville is a transit port and the head office of the 'Grands Lacs' company controlling a Belgian river, rail, and lake organization.

Particulars of the goods traffic by rail between Kabalo and Albertville have already been given (p. 347). Before Katanga was connected by railway with Lobito bay this line carried a considerable proportion of the copper exported from Katanga via Dar-es-Salaam, although, by this route, after the initial loading, goods have to be transhipped at Bukama, Kabalo, Albertville, and Kigoma. In the large commercial centre of the town both European and Asiatic firms have stores and shops. Banks comprise the Banque Belge d'Afrique, Banque Commerciale du Congo, and Banque du Congo Belge. The shops include the usual minor tradesmen. There are also half a dozen mining offices and a few contractors.

Petrol and Petroleum

No particulars.

Shipping

Albertville is the base for the flotilla of the Chemin de Fer aux Grand Lacs, and the company maintains weekly services between Albertville, Kigoma, and Usumbura. In 1931 the company had the following fleet:

Vessels	*Tonnage*
5 Steamers (including 2 of 340 tons each), total	820
Pontoons	610
Whaleboats and barges	3,350

Local Industries

Some coal is mined in the neighbourhood and used on the railway and by the lake steamers. Lime is also produced locally. The goldfield in the Lukuga valley has been mentioned (p. 347).

Communications

Lake

Tanganyika Territory through Kigoma; Northern Rhodesia through Mpulungu; Uganda through Usumbura.

Road

N. and then W. to Kabambare and Kasongo.

Railway

Kabalo (170 miles).

2. USUMBURA

Lat. 3° 23′ S., long. 29° 21′. Altitude 2,630 feet. Hotels. Hospitals. Cinemas. Garage.

Site

Usumbura, the port of Ruanda-Urundi, is a well-constructed lake harbour at the north-east corner of Lake Tanganyika, and contains a pier, custom-house, and immigration offices.

Detailed Description

Pier

	Feet
Total Length	225

Note. There is accommodation for craft on both sides. Two rail tracks, with a gauge of 3 ft. 6 in., run the full length of the pier, and hand-propelled trucks run on these tracks and convey goods from the pier to the sheds.

Lifting Facilities

One 3-ton travelling steam crane, running on one of the tracks on the pier.

Port Facilities

No docks or slipways.

The Town

Description

The township of Usumbura is situated at the north-eastern limit of Lake Tanganyika. It is the headquarters of the territory of Usumbura, in the residency of Urundi, and the capital of the mandated territories of Ruanda-Urundi. The shores of the lake are marshy in places, although part of this marshy bank is being reclaimed. The government station has been built a little way inland, at an elevation of 100 feet above the mean level of the lake. Usumbura is the seat of the Governor of Ruanda-Urundi, and Government House and the government offices are situated in the centre of the township. Government institutions include hospitals, printing press, and post and telegraph office. Sittings of a police court, court of first instance, and appeal court are held here. Military courts and military courts of appeal are also convened. Electric light has been installed. The

water-supply is uncertain and is delivered in motor trucks. Usumbura is served with wireless telegraphy. The airfield lies to the east and there are also large cantonments and native villages on the outskirts. In peace-time a territorial company of the Force Publique and a European volunteer detachment are stationed at Usumbura. Immediately to the north of the government quarter stands the church of the White Fathers, while the extensive and well-laid-out commercial quarter is situated to the north-west, close to the pier. Usumbura has four hotels and two cinemas.

Trade

The trade of Usumbura is comparatively small but is increasing. During the period 1934–1938, inclusive, it more than doubled. In 1938 the total tonnage handled in the port was 24,000 tons, of which one-third was in-coming traffic and two-thirds out-going traffic. The chief exports are coffee and cotton, cassiterite and hides. The quantities of these shipped in 1938 were:

	Tons
Coffee	2,860
Cotton	990
Cassiterite	1,325
Hides	282

The chief increases in exports have been in coffee and cotton, while the increase in imports has been mainly in petrol consigned from Belgian Congo and salt and building-materials from other countries.

Ruanda-Urundi has two main export routes—to the east and to the west. The former is by lake steamer to Kigoma and then by Tanganyika Railways to Dar-es-Salaam, while the latter crosses the lake to Albertville and continues by Belgian rail and river route to Matadi. All this traffic passes through Usumbura.

Since Ruanda-Urundi ceased to be a German protectorate and became a Belgian mandate, trade has been more and more diverted from the east coast to the west coast route. A comparison between 1935 and 1938 shows that the east coast overseas export trade remained more or less stationary at 1,700 tons, while the west coast overseas trade increased from 3,700 to 4,800 tons. Overseas imports from the east remained stationary at 4,500 tons, while overseas imports from the west, which in 1934 were only 500 tons, increased from 1,000 tons to 3,700 tons, due to the import of materials from Belgium and elsewhere for the development of the territory.

Most of the coffee is shipped via Matadi and only a little by the

east coast route. In 1938, 2,224 tons went by the Congo and only about 640 tons to Dar-es-Salaam. All the cotton goes to the Belgian seaport. In 1938 all the cassiterite was exported through the Belgian Congo. The bulk of the hides, however, goes east. Since 1937 the Belgians have shipped a small quantity via Matadi, but in 1938 only 2 tons went by this route, as against 280 tons to Dar-es-Salaam.

The commercial quarter contains shops and trading stores of all classes. Banking is carried on by the Banque Belge d'Afrique, Banque Commerciale du Congo, and Banque du Congo Belge. There is an Usumbura Chamber of Commerce. Several firms undertake motor transport into the interior of the country, and there are firms of contractors.

Petroleum

Petrocongo and the Vacuum Oil Co. have depots.

Shipping

The Belgian steamers from Albertville touch at Kigoma and then call regularly.

Local Industries

One company supplies electricity and another manufactures mineral waters. There is also a cotton ginnery and a soap-works, as well as a trade in hides.

Communications

Lake

Uvira, Albertville, and Vua, in Belgian Congo; Kigoma, in Tanganyika Territory, and Mpulungu in Northern Rhodesia.

Roads

E. Kitega (73 miles) and Uganda.
W. Uvira (20 miles).

Railways

None.

3. KIGOMA

Lat. 4° 50′ S., long. 29° 36′. Population 2,500 (estimated). Hotel. Hospital.

SITE AND DESCRIPTION

Kigoma is in British territory, but it is inserted here because the Belgian Government has a concession within the port. In 1921 the

British Government leased to Belgium in perpetuity, at the annual peppercorn rent of one franc, sites in the ports of Dar-es-Salaam and Kigoma. Belgian imports by this route thus escape British customs duty. Kigoma is the chief port on the east side of Lake Tanganyika. It lies on a bay, 4 miles north of Ujiji, where Livingstone was found by Stanley in 1871. The harbour is well-built, with the railway and marshalling yard alongside. The entrance to the anchorage is a mile wide. The minimum width of the approach channel is 1,700 yards and its maximum width 2,000 yards. Kigoma contains administrative headquarters, railway terminus, hotel, native hospital, and Belgian wireless station. There is an airfield 2½ miles to the east of the township.

Detailed Description

Depths

Anchorage	*Feet*
Entrance, minimum	19
Approach channel, minimum	16
At pier, maximum	10

Piers, &c.

Total Lengths

Quay wall of 1,000 feet.
Mole of 358 feet.

Lifting Facilities	*Capacity in tons*
1 steam crane	2
2 cranes	5

Warehouses

There are transit sheds with an area of 26,900 square feet.

Port Facilities

There is no dry dock, but there is a slipway which is power-operated and can take the biggest steamer on the lake. There is an excellent workshop attached. Both slip and shop are worked by, and belong to, the Tanganyika Railways.

Shipping

The only traffic figures available are for 1936:

Total number of ships entering port

	Number	*Net tonnage*
British . . .	64	13,013
Others . . .	225	75,905
TOTAL . .	289	88,918

The Tanganyika Railways maintain a fortnightly service between Kigoma and the British lake ports to the south including Mpulungu in Northern Rhodesia. The railway fleet in 1940 consisted of:

Vessel	*Cargo in tons*
Twin screw steamer	700
Single screw steamer	30
Motor-boat	..
Lighters (2 large and 2 small), total . . .	140

There were also, in 1939, eight privately owned dhows with a total registered tonnage of 60 tons.

The Union-Castle agents are the Agence Belge de l'Est Africain.

Communications

Lake

Albertville, Mpulungu, and other lake ports.

Railway

Tabora (258 miles); Mwanza, Lake Victoria (493 miles); Dar-es-Salaam (789 miles).

4. MINOR PORTS

Smaller places which are visited by lake vessels but hardly come up to the level of ports are Uvira, on Lake Tanganyika; Kasenyi, on Lake Albert; Kasenga, on the Luapula river flowing into Lake Mwero, and Pweto on that lake. For information as to these, *see* the Gazetteer and the chapter on communications.

CHAPTER XII

AGRICULTURE AND FORESTRY

AGRICULTURE

(Figs. 61 and 62)

AGRICULTURE in the Belgian Congo falls into two broad divisions: Native, or subsistence; and European, or plantation and economic.

As natives generally produce their own food-supplies, the total acreage under native food crops is large, but in proportion to the population, and not in proportion to the vast area over which it is spread. Over and above food for his family the native often produces ground-nuts, cotton, and coffee for sale. As there are over four hundred natives to every European settler, it follows that agriculture must be predominantly of native type. But the two types of agriculture interact and intertwine; natives supply labour for plantations, whether great or small, and not infrequently native tools are used thereon. Moreover, both Europeans and natives often cultivate the same crops or plant the same trees, e.g. coffee and oil palms.

As elsewhere in Africa there is a sharp division of opinion as to the relative merits of the two methods of agriculture. The general trend seems to be for cotton, ground-nuts, some coffee, oil seeds, and oil palms to be relegated to the natives. The efficient cultivation of tea, sisal, and sugar-cane, as well as cattle-ranching, on the other hand, demands more capital than they possess and much more business organization than they can contrive.

In that which follows the crops grown under the two headings are treated separately. Coffee, for example, is mentioned twice, first as a native then as a plantation crop, for the two are distinct. Land tenure is also dealt with in both sections.

Before crops are discussed in detail it will be well to glance at the steps the Government have taken to organize agriculture as a whole.

Official Organization

Few tropical African colonies have devoted so much time and money to agricultural research and experiment as the Belgian Congo. The University of Louvain in Belgium has, in the colony, its own stations known as Cadulac (Centres Agronomiques de l'Université de Louvain au Congo) for improving native agricultural methods.

Both agricultural and veterinary research is carried out by Inéac (Institut National pour l'Étude Agronomique du Congo Belge), which was established in 1933. The principal experimental stations of Inéac are at Yangambi near Stanleyville, where rubber, oil

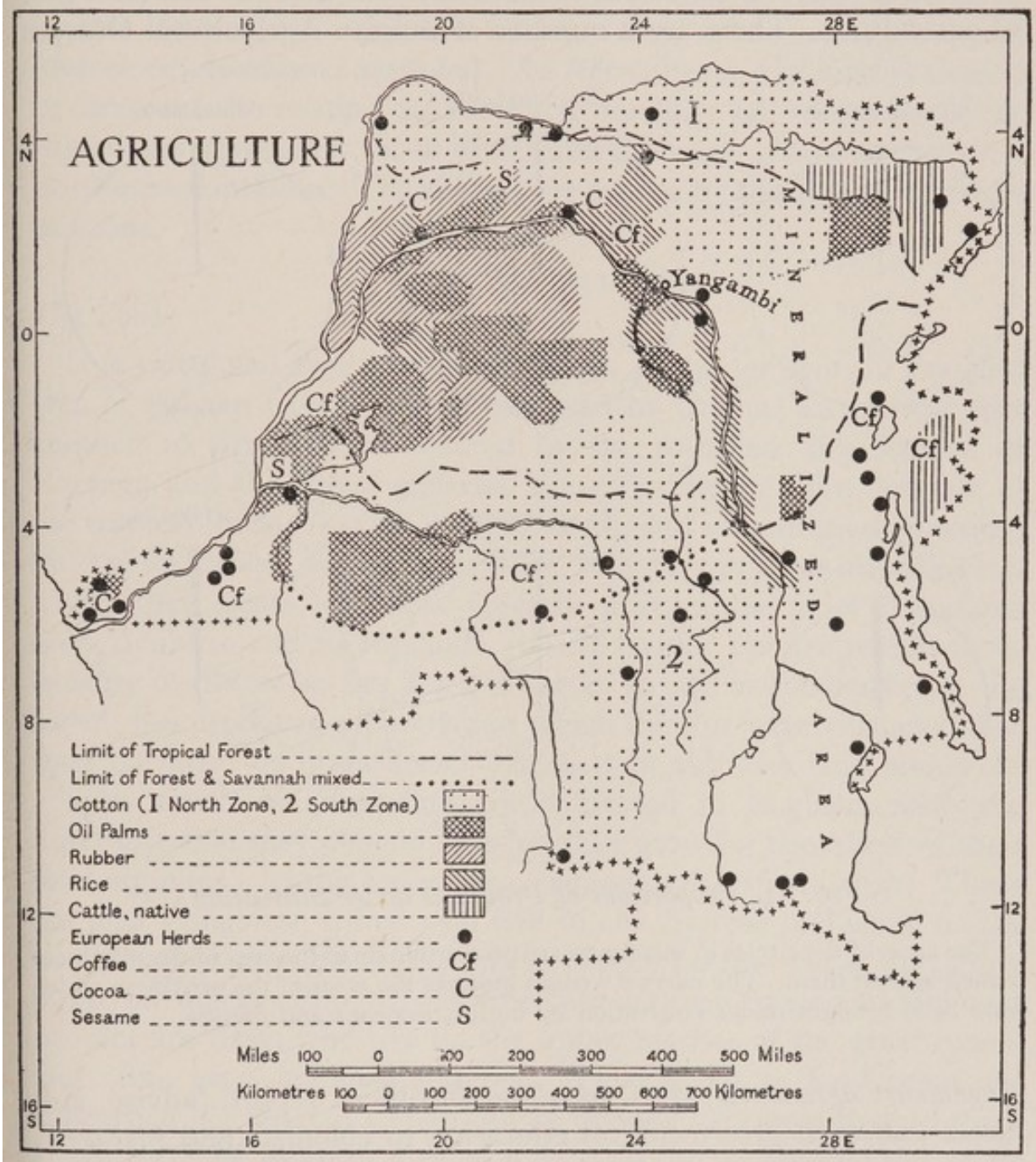


FIG. 61

palms, coffee, and native foodstuffs are studied; at Gazi (about 18 miles north of Yangambi), where the work is concentrated on rubber and cocoa; at Lula, for robusta coffee; and at Bacumba for soils as well as oil palms and cocoa. The staffs at the cotton stations of Bambesa in the Uele district and Gandajika in the Sankuru

district study pest-control as well as seed-selection. Only seed approved by Inéac is distributed to native cultivators. There is also a stock farm at Nioka, near Lake Albert, where native cattle and mixed farming are studied.

The Agricultural Service is more concerned with the practical side of agriculture. There are a number of Belgian Agricultural Officers

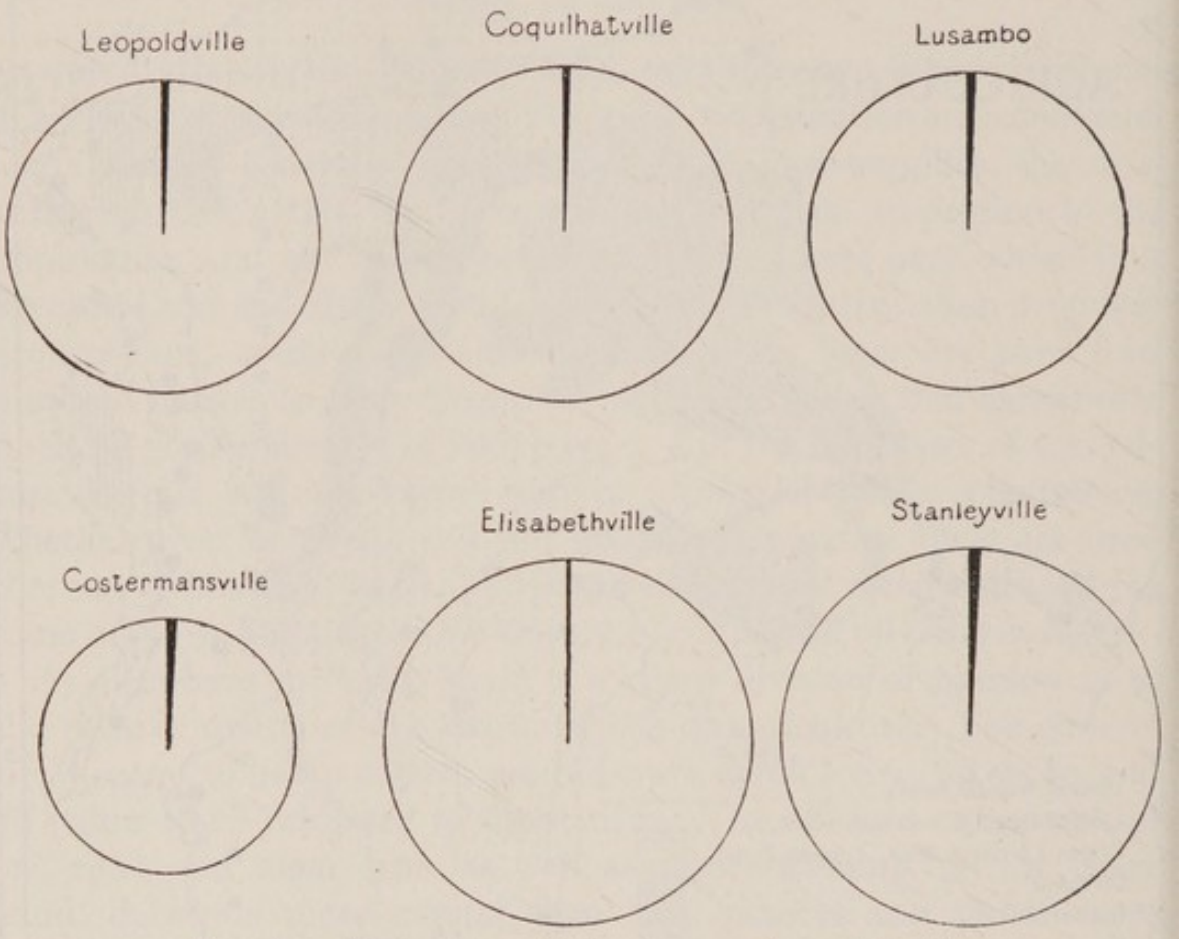


FIG. 62. *Proportions of Provinces under cultivation*

The areas of the circles in this figure are proportionate to the area of the provinces named against them. The narrow wedges indicate the areas of the provinces which have been brought under cultivation by both Europeans and natives.

(*Ingénieurs agronomes*) who, to quote an official report, 'advise, aid, direct and even give technical education to colonists and planters'. They are also concerned with native agriculture. There were, besides, roughly 3,500 native Agricultural Instructors (*Moniteurs agricoles*) employed up and down the country in 1937. These men were often of the old sergeant-major type with not much knowledge, and are being replaced by other natives who have been educated in the agricultural schools of the country. How far replacement has proceeded is not known.

Agricultural Schools for Natives

Two schools of agriculture have been maintained since 1933, one at the Roman Catholic mission station at Kisantu, in the Bas-Congo, and the other at Bunia, Stanleyville province. A third was under construction at Kaponde, Lusambo province, in 1938. In these schools natives are educated to take their place as Agricultural Assistants (*Auxiliaires agricoles*). An Agricultural Assistant is trained to carry out the routine duties which normally fall to the lot of the Ingénieurs agronomes, or to undertake the work of an overseer on a European plantation. The schools are staffed by the Roman Catholic missions.

Native Agriculture

The Zones

It is calculated that somewhere about 40–45 per cent. of the land area of Belgian Congo is overshadowed by tropical forest, and that another 10 per cent. is covered by the so-called 'dry forests' of Katanga and the forest galleries along the rivers. The interior of the tropical forests is often gloomy, dank, and sometimes depressing, but, nevertheless, tribes have been able to settle, or to cultivate, within their shade. Obviously forests must impose strict limitations on agriculture and its methods. Cattle cannot pasture within them because of the tsetse-fly. Lack of cattle, as well as the density of the forest, has produced a population which lives in large villages rather than on farms or in gardens. The natives cultivate land about the villages much as allotments are cultivated in England, with the difference that they depend on what they grow for the whole of their food-supplies. In the forest area manioc is the staple crop. There are also Congolese tribes who live in the fly-free highlands to the north-east of the colony, and these people possess cattle and grow maize or millets. Roughly intermediate between forest and highland peoples are those who live on the upper reaches of the great rivers, and often grow bananas and rice. Thus as far as food crops are concerned the Belgian Congo can be divided very broadly into three zones: (1) The forest or manioc zone; (2) The banana and rice zone; (3) The maize zone.

These zones encroach into and overlap one another, for there is no hard-and-fast boundary between them.

Native Land Tenure

In so great a country, containing so many tribes, it cannot be expected that the tribal system of land tenure is, or has been, one

and the same throughout its length and breadth. That there were rigid native rules concerning land is now recognized, however much they were ignored by Europeans in the early days of settlement.

In Bas-Congo (below Stanley Pool) the soil within a native town was not originally held in common and apparently it is not now so held. Each family possessed, and possesses, enough land for all purposes within the village boundary. Outside the village boundaries rights to land have 'the character of a privilege based on the membership of the community, entitling every member to the beneficial use of the community lands, for grazing, hunting, collecting fruits or cultivation'. Thus even apparently unoccupied lands have a master, for they belong to the people, and it was recognized that individuals could claim rights in woodlands, or bush. They could claim the produce of these lands, that is the palms, vines, and the wild fruits which grew on them. If a native wished to find more land in another neighbourhood than his own he would have to seek the permission of the local chief of that area. The authority which a chief possessed, or possesses, to dispose of tribal land, other than by granting permission to settle, is at best undefined, although some natives say that he 'owns' it.

In the Bangala district, 500 miles farther up the river, there is a description of the purchase of a site for a mission station in 1890, which throws some light on the local tribe's conception of land ownership fifty years ago. The site was on the bank of the Congo, and contained about 6 acres. Most of the inhabitants of the native 'town', male and female, attended the 'palaver', because the matter concerned them all. The negotiations were conducted by headmen. The price paid for the land was 1,500 pieces of brass wire, with other trifles, in all worth about 38 shillings. The purchase price was divided among the headmen and their followers. By this transaction the mission obtained the right of user in the land as long as they cared to exercise it. None of the natives concerned considered that they had alienated the land in perpetuity, or even that land could be so alienated. The account of the transaction continues:

'The land surrounding a town belongs to the people who live in the town. Certain landmarks, such as streams, forests, &c., are agreed upon as boundaries. The land reaches right up to the boundary of the next town, but if the town is some distance from the forest boundary, then the ground between the boundaries is neutral land in which folk of both towns can hunt, cut timber, &c., as they please. Within the boundary the people of the town are free to make their farms and build their houses where they

like, provided the land is not already occupied by someone else. Priority of occupation is the only title recognised. There is no such thing as unclaimed land. It is either within the boundary and is claimed by the town living on it or it is between boundaries and is for the benefit of the near towns for neutral hunting, &c., but no one can sell that land without the consent of these towns that are mutually benefited by it. . . .'

Among the Bayaka tribe in the south, whose chiefs were men of considerable force of character and powers, it appears that at least some hunting-grounds were private property, and the owner of a part received a leg of any animal killed on it. The chief, therefore, did not own everything.

The Azande in the north-east at one time lived in isolated homesteads often widely separated from each other. Homesteads were settled after a chief, or his deputy, had granted permission. In Ruanda and Urundi, where there are powerful hereditary chiefs, the greater part of the land seems to be vested in them, but there are all sorts of unexpected rights accruing to clans or individuals.

Enough has been said to show that the laws of native land tenure are complex, or were complex, before Europeans interfered with them. One fact is clear, that the notion of land as a saleable commodity is foreign to native thought. It is the produce of the land rather than the land itself of which the native thinks. A native may say that he has sold his farm. By that he means that he has sold the crops now standing on the farm, and after that the right to cultivate where they stood. But when he sells he can give no better title than he himself possesses, and that title is vague. In general it may be said that land for cultivation is allotted by a chief, or by the headmen of the village, although, as noted above, individual ownership is not unknown. The cultivated plot is practically a man's own as long as crops grow on it. The rest of the untilled village land is more often than not communal, and all have equal rights over it.

Shifting Cultivation

The system described above is bound up with the practice of shifting cultivation. So long as land is abundant a plot can be abandoned when the soil is exhausted. After three to five years of intensive cultivation soils which have not received any nourishment become exhausted. Then a new plot is chosen and is cleared by cutting and burning the bush; a process which provides fertilizer in the form of ash, cleans the soil for cropping, and destroys the insects which infest everything in Africa. Shifting cultivation is often

destructive and is frowned upon by experts. Valuable trees are destroyed, and erosion carries soil away from the bared plot. Nevertheless, shifting cultivation is still practised and must be until manure takes the place of fallowing.

The Family at Work

It is usually asserted that the woman is the great agriculturalist among Congo tribes; but men, too, play their part. Indeed there are very definite tasks for men and women, which vary from tribe to tribe and area to area. Among the Bangala, Mangbetu, Wangata, Balesa, Batetela, and Basonge the men first clear the land. They ring-bark, fell, and burn the trees, and their women help them in this task. Among other tribes it is usual for the men to prepare the land without the help of their women, who come on the scene only after the land has been cleared of timber and undergrowth. On the Aruwimi river, in parts of Kivu province, and south of the Lukuga river in Elisabethville province, men are not ashamed to be seen with their wives actually tilling the soil after it has been cleared. Elsewhere a man will scorn to use, or even to be seen with, a hoe, which is looked upon as a woman's implement. (Sir Harry Johnston records that, fifty years ago, if a prisoner of war was handed over to the women of Bolobo they dispatched him or her with hoes.) Palms, banana groves, sugar-cane, and tobacco are often planted and tended by men. In the lower Congo the women plant pumpkins and calabashes, but they must observe certain taboos before doing so. It is not surprising that charms, taboos, ceremonies, and incantations enter into agriculture as they do in all other native activities.

Tools

The majority of Congolese have neither seen nor heard of a plough. There remain the tools which are common to most Africans, and which they have evolved themselves for their own type of agriculture. They are simple and number but three or four. An axe, a hoe, a slashing knife or tool, sometimes a primitive rake, and perhaps a dibber, or planting stick, complete the list. By the aid of these simple appliances any native worth his salt (a phrase which means what it says in the Congo) can establish himself. He can build his house, and prepare his land, if he but uses them diligently.

The native has discovered that he can buy from European traders tools more durable than those manufactured out of soft local iron by the village smith. The imported axe or hoe follows the native design

in as far as the head consists of a cutting-edge with a spike at the other end to pass through a knob on the helve. Many tribes had their own ancestral design of hoe, heart-shaped, shield-shaped, ribbed, and so on. Some tribes used a long helve, some a short. Because of the 'trade hoe' there is now a tendency towards uniformity, but short-handled hoes are preferred in light forest soil.

A hoe takes the place of plough, spade, or pickaxe. It is especially adapted for work in places where a plough could not work, e.g. between the tree stumps, or in awkwardly shaped plots. With it the women are accustomed to carry out work for which we should think half a dozen tools insufficient.

Native Food Crops

(Fig. 63)

The Manioc (Cassava) Zone

Manioc is planted mainly in forest lands and is the staple food of more than half of the native population. The root is familiar to us as tapioca. Some competent observers hold that the native preparation is, if possible, even more revolting than that glutinous tapioca pudding which made their school-days unhappy. The solid boiled puddings, usually known as 'kwanga', made from manioc flour are the natives' bread. Porridge and gruel are also made from it, and the leaves make excellent spinach. The plant is said to have been introduced by the Portuguese in the seventeenth century from South America. There are several varieties of manioc, but there are two main classes: sweet manioc (*Manihot Aipi*) and bitter manioc (*Manihot utilissima*). Bitter manioc is semi-poisonous; its tubers have to be well soaked in water and washed before use, for they contain a certain amount of prussic acid, whereas sweet manioc is almost free from it. The cultivation of manioc of both types is simple, and the returns are generally large; but it speedily exhausts the soil. The plant has knotty stems growing to a height of as much as 8 feet, though generally not more than 3 or 4. The roots swell into large tubers of buff colour. What quantity of manioc the Congo produces is unknown, but in 1936 it was estimated that at least 825,000–826,000 acres were devoted to its cultivation. In 1937 the acreage was much reduced. The greatest manioc-growing district was Kwango (Leopoldville province), the next Kivu (Costermansville province).

As will appear, rice and bananas are also grown in the manioc zone.

The Rice Zone

The total area under rice ranks third in the list (Fig. 63). The majority of the rice-cultivating peoples live in the Stanleyville and Costermansville provinces. Arabs penetrated into these provinces in the decades immediately before the formation of the Free State, and brought with them from East Africa rice seed which did well along the banks of the Lualaba and Lomami rivers. Two main types of rice are in question, the hill and the swamp varieties. The first grows at high altitudes without special irrigation, the second grows in hot, humid

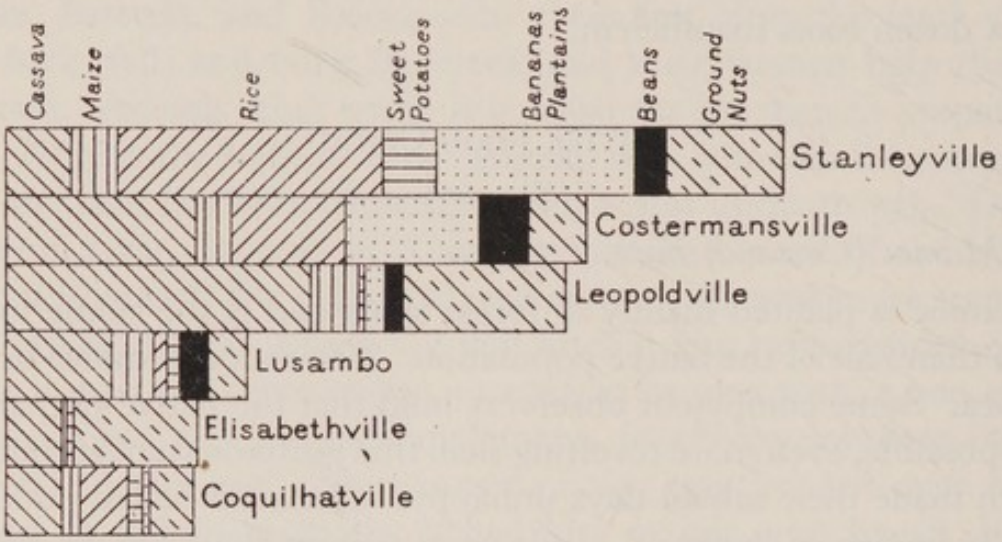


FIG. 63. *Native Food Crops. Comparison of areas under cultivation in each province. 1937*

regions where water is plentiful. The Congo river system provides water in plenty and the climate is suitable, but the cultivation of rice is more difficult than that of manioc. The plant when ripening requires constant watching or multitudes of birds will devour the seed. Some natives dislike rice and will only eat it *faute de mieux*, but quantities are grown not only for the home but also for feeding native labourers in the mining and industrial districts. In 1937, 33,760 tons of paddy, or unhusked rice, were produced in Stanleyville province alone. Rice is also cultivated about Bumba in Coquilhatville province.

The Maize Zone

Maize is not indigenous to Africa, although it is now cultivated widely. There are many varieties of the plant. Some varieties produce a large cob, some a small; in some cobs the grains are whitish, in others they are yellowish-red or red. Some grains are hard, some are soft. Those natives who grow maize for their staple food are particular

about the type they grow. The women usually dislike a hard gritty grain, in spite of its keeping qualities, because of the labour expended in grinding it. Maize when ground is prepared in various ways, but generally as a stiff porridge or a thin gruel. It is also used for beer-making. Maize is cultivated in quantities on the highlands. Elsewhere it is regarded as a snatch crop to be put in while manioc is still growing and to be reaped before manioc is ready for use. Another advantage is that it can be eaten before it has ripened. Maize is a commodity of internal trade, as appears in the chapter on Trade.

Other Crops

Millets. Millets thrive in the drier open savanna country, and their cultivation is usually associated with cattle-owning peoples. Millets include Eleusine (*Eleusine coracana*), Bulrush millet, and Sorghum (also known as Great Millet, Guinea corn, Dhurra, Kaffir corn, or Broom corn). Millets are used for beer brewing as well as for food.

Sorghum is a tall plant reaching 9 feet in height, with a knotty stalk as thick as an ordinary walking-stick. The corn grows in ears which hang in feathery clusters, and which when ripe often bend the stalk down to the ground. The leaves are very like those of the maize plant. The corn (which is about the size and shape of pearl barley) is either red, white, or almost black. The red variety is prized for its beer-making qualities. The leaves and stalk make excellent fodder for cattle, as they contain a little sugar. Boys and girls in the millet-growing areas may be seen chewing stalks of sorghum for the sake of its sweetness.

Bulrush millets describe themselves. The small brown grains are encased in a head very like that of a bulrush. The plant thrives in a drier climate than that of the Congo basin. Eleusine grows low on the ground on a slender stalk.

Where millets are used for food they are pounded in wooden mortars in order to break them up and to remove the husk. The bruised seed is then ground to flour on a stone. A thick porridge or a thin gruel is made from the flour.

Bananas. Bananas and plantains are cultivated as a food mainly in Stanleyville and Costermansville provinces. As one author puts it: 'The fruit of the plantain supplies food for multitudes of people; indeed it is to the inhabitants of the torrid zone what bread and potatoes are to those of the north temperate zone. . . . It has been said that a pound of plantains contains more nutriment than three pounds of meat, whilst as a food it is in every sense superior to the best

wheaten flour. . . .' This is the view of an enthusiast and not of a modern specialist on diet. The fact remains that the natives who eat plantains, or the flour prepared from them, seem to do remarkably well on it, as for example the Lokele tribe, west of Stanleyville. The banana, it is said, was introduced by the Portuguese into Africa; the plantain may be indigenous to west central Africa. The plantain produces a firm ribbed fruit which may be 18 inches long, and is eaten cooked. The soft sweet fruit of the banana does not need description except to remark that there are probably as many varieties of bananas as there are of apples. There are few tropical plants so easy to cultivate. Both the plantain and the banana send off side shoots, or 'suckers', which grow into a bunch of stems. A half-dozen or so plants growing together may be seen in most native plantations; all that is necessary is to separate a young sucker from its parent and transplant it in suitable soil. It usually grows vigorously. Bananas are used for beer-making as well as for consumption; plantains are boiled, pounded into flour, and made into solid puddings.

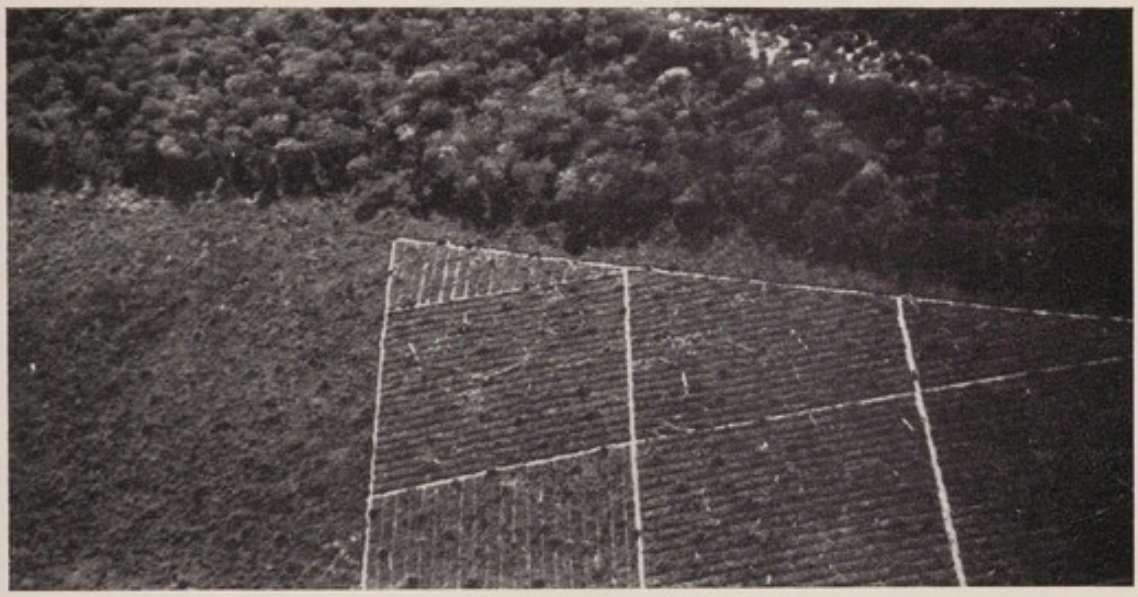
Ground-nuts (*Arachide*). The acreage planted with ground-nuts is second only to that of manioc, but they are not grown only as a food. Cultivation for export has received much attention from the Government. In Coquilhatville province, for example, the natives are compelled by law to cultivate ground-nuts.

The plant is small and bushy, and stands about a foot high. After the flowers have fallen, the stalk turns downwards, burying the ovary in the soil, where the familiar nuts are formed. The nuts consist of two or three seeds, deep red or brown in colour, which are encased in a single, tough, and much wrinkled shell or pod, of parchment colour. The seeds contain a certain amount of oil used for cooking or converted into margarine and soap. Natives use them in a variety of ways for their own culinary purposes. Ground-nut oil is not the equal of palm oil in nutritive value, yet it is excellent for cooking, and ground-nuts are a wholesome and welcome addition to the monotonous diet with which natives are content, and several varieties of relish are made from them. The plant is comparatively quick growing. When the crop is ripe it is hoed up, and the nuts, taken off the plants, are dried in the sun. The familiar 'monkey nuts' or 'pea nuts' are ground-nuts at this stage. Cultivation sounds simple enough, but like all other African plants it is prone to be attacked by pest and disease. 'Rosetta' disease, which withers the leaves and injures the seeds, is the chief plague.

Sweet Potatoes. Sweet potatoes are sometimes confused with yams,



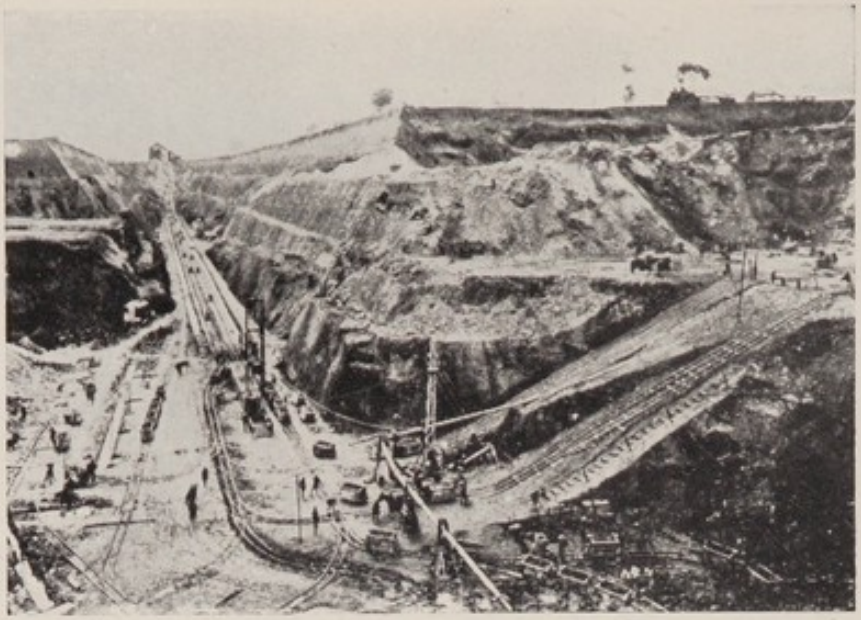
79. *Plantains on sale, Stanleyville*



80. *European agriculture. Plantation cut out of forest*



81. *Coffee plantation near Lake Kivu*



82. *Open cut mining. Ruashi copper mine, Katanga*



83. *Diamond mine, Kasai*



84. *Copper smelting works, Lumbumbashi, Katanga*

which are also grown to a small extent in Congo. The sweet potato plant is a convolvulus with a trailing stem and purple flower. The stems are from 6 to 8 feet long, and send out roots at every node, or knob, where it rests on the earth. Where they root the stems produce tubers of varying sizes and shapes, as does also the original root. There are several varieties of sweet potatoes, but broadly they can be divided into two types, the red and the white or buff. Both types are considered to be more nutritious than the common potato known to us. Plants are propagated by cuttings from the stems. It is in the east (Stanleyville province) where they are most extensively grown, probably because of its contacts with east Africa where sweet potatoes are a very common crop. Of the acreage under cultivation in 1937, 53 per cent. was in Kibali-Ituri district, 13 per cent. in the Kwango, 18 per cent. in the Tshuapa, 5 per cent. in Tanganika, and 11 per cent. in the Kasai districts. Very little appears to be grown in the lower Congo.

Sweet potatoes are a great stand-by in times of food shortage when the stocks of grain are running short, but they require careful cultivation and will not survive under the perfunctory treatment usual among the forest tribes.

Beans. Beans and peas are grown more in the east of the colony than elsewhere. The type of bean usually grown is the 'haricot', in size and shape like the 'Heinz baked bean' of tomato sauce fame, but of a different colour. They are black, purple, red, or variegated, and a pot of beans is a delight to a child because of its mixed colours. Beans are grown in the Kwango and Kasai, as well as in the Kibali-Ituri and Kivu districts. Of the total food crop cultivated beans and peas contribute less than 5 per cent.

Tobacco. Besides the foodstuffs described above, natives usually plant a patch of tobacco for their own use. It is said that tobacco cannot have been introduced into the west coast of Africa until well into the middle of the sixteenth century, yet it has penetrated deep into the innermost recesses of Congo as well as elsewhere in black Africa. Both men and women use tobacco, and some prefer it as snuff.

Gourds. Gourds (calabashes) are grown for household use, usually on the rubbish-heap. Without gourds a native housewife would be hard pressed indeed. Dried gourds serve as bottles, water dippers, cups, rattles for a dance, and for many other domestic purposes. The gourd grows on a vine not unlike that of a vegetable marrow.

Sugar-cane and Fruits. Before Stanley discovered the Congo a limited amount of sugar-cane was cultivated along the river and its

tributaries, though it cannot have been known in the Congo before the beginning of the seventeenth century. Sugar-cane is still grown, though not extensively. Besides using it as a sweetmeat, riverside tribes make a fermented drink from the juice. It may be regarded as a sort of extra to native cultivation much as fruit-trees in an English garden. While mentioning fruit it will be well to note that little is grown for home consumption. Paw-paw may be seen in most villages and perhaps a mango tree, whilst an orange or a lime may be planted by the more sophisticated, but generally fruit-trees are remarkable for their absence. There are, however, quantities of pine-apples growing in the forests of the lower Congo.

Native Improvidence

No description of the food crops of the native can be complete without reference to his improvidence. The catalogue of crops, given above, might lead one to imagine that the native lives in a land of easy plenty. The plenty is apparent rather than real. Diseases and insect pests, flourishing in tropical profusion, reduce his crop, whilst elephant, buffalo, and antelope, floods and tornadoes, may, in a few hours, destroy next year's food supply. Yet an African native is constitutionally incapable of exercising any sort of economy. If he has a stock of food, small or great, he will use it freely until it is exhausted, making no attempt to husband it. Because of the uncertainty of his harvest, and his own negligence, the native may often be without food. In such times he takes to the forest or bush and collects roots, wild herbs, insects, wild fruits, and manages to eke out an existence until he can gather a harvest once more. Fine crops can sometimes be seen growing in the fields while villages go hungry. They have been caught between crops, having exhausted the old before the new is ripe.

Native Economic Crops

Official Policy

The native agriculturalist also cultivates cotton, coffee, and other crops which he uses not at all, or very little, for himself. European wheat and potatoes are grown occasionally for the market. Groundnuts the native consumes or sells to traders as he is inclined. But to understand the cultivation of native economic crops it is necessary to make an excursion into recent history.

In August 1933 the British Consul at Leopoldville, reviewing the economic situation in the Belgian Congo, wrote:

'. . . In this time of acute depression agriculture has, in the general policy of the Colony, retaken pride of place, for it is only in agriculture that there is, at the present time, any genuine hope of employing and feeding the bulk of the native population. The late demands for labour for purposes of colonial development and industry have dwindled, temporarily at least, to insignificant proportions. Cotton, coffee, and rice have passed from the experimental stage into the staple economic life of a large agrarian population. . . .'

Elsewhere in the same report he speaks of the years 1929 and 1930 as the peak period of prosperity in all branches of endeavour in the Belgian Congo, when 'the tables at cafés and hotels served as "exchanges" for the frenzied buying and selling of existent and non-existent produce at boom prices'. In short, in 1931–1932 the bottom fell out of things in the Belgian Congo, as elsewhere. Many Europeans left the country in despair. Meanwhile on 25 July 1933 the present King of the Belgians, who had returned from a visit to Belgian Congo, made an important speech in the Belgian Senate. The gist of the speech was that the tropical colonies which had proved best able to meet economic disturbances were those in which the development of the land remained mainly in the hands of the natives. In their own colony of Congo, he thought, European agricultural activities should be restricted to those beyond the powers of the natives. Scientific research and experiments in tropical agriculture, the purchase, processing, transport, and export of natural products, or economic crops, were quite beyond their abilities. They could grow valuable products, but they did not know what to do with them when grown. It is now a matter of record that the colony, since 1933 particularly, has developed its valuable agricultural resources by exploiting crops, particularly cotton, coffee, and ground-nuts, which natives are able to cultivate with little help in the way of implements other than their own hoes.

Compulsory Cultivation

In British colonies the Government takes power to compel natives to plant sufficient food crops to guard themselves against any sort of food shortage. Beyond this our governments have generally been loath to proceed. In Uganda, however, the cultivation of cotton has been made compulsory, and in the Belgian Congo the cultivation of certain economic crops is also compulsory. Compulsion was first introduced during the War of 1914–1918. By virtue of the law natives must plant and maintain sufficient food crops and also 'des cultures

de vivre ou des produits d'exportation imposés à titre éducatif'. The cultivation of economic crops is deemed to be educative, but any produce grown by natives under this law is their own, and can be disposed of by them. Cotton, coffee, oil palms, and ground-nuts are some of the crops grown in consequence.

Economic Crop Zones

As has been stated there are three native food zones in Congo, but European, or government, intervention in agriculture has produced another set of zones which do not coincide with the former. Those for economic crops are:

1. Cotton Zone, north.
2. ,, ,, south.
3. Oil Palm—Rubber Zone.
4. Coffee Zone.

Zones 1 and 2 are usually on the highlands, 1 to the north-east, and 2 to the south of the forest, though they may intrude into it. Zone 3 is roughly identical with the Congo forest, and lies, therefore, between 1 and 2. As has been pointed out the native manioc zone is usually within the forest, and roughly coincides with Zone 3, but not entirely so since rice is also grown in the forest. Zone 4 corresponds to the area of Arab penetration.

The Crops

Cotton. Cultivation of the cotton plant is a native industry which is carried on in and around the native villages. It is also one of the most valuable crops in the Congo. Government fixes the price of the plucked, or raw, cotton for some time ahead, thereby protecting the natives from the perplexity of following the fluctuations of the market. Raw cotton, when purchased, passes to a European ginnery (usine d'égrenage du coton).

The colony is divided into two cotton zones, north and south. In the northern zone are the administrative districts of Uele, Kibali-Ituru, Stanleyville, and Congo–Ubangi. In the southern zone are Sankuru, Kasai, Lac Leopold II, Manyema, Kivu, Lualaba, and Tanganika. In 1937, 42 per cent. of the total crop came from the Uele district.

The production of cotton has advanced steadily from small beginnings. In the season 1917/1918 only 104 tons were produced in the whole colony, by 1923/1924 the total reached 3,360 tons. In recent years the acreage under cultivation was as follows:

TABLE I

	Acres		
	North Zone	*South Zone*	*Total*
1935 . .	398,680	268,600	667,280
1936 . .	420,720	331,210	751,930
1937 . .	512,490	379,450	891,940
1938 } 1939 } . .	No figures available		
1940 . .	573,700	390,000	963,700
1941 . .	578,100	393,000	971,100

In the Kasai region several native varieties of cotton have been known for many years, but the cotton now planted in Congo is from an imported seed known as 'Upland Big Boll'. The length of staple grown in the North Zone is from ½ inch to 1¼ inches. In the South Zone it is from ¾ inch to 1 inch. The quality appears to be good.

As elsewhere in Africa, cotton plants have many enemies; white ants, red bollworm, and cotton-stainer bug, are but a few of them. The burning of all old plants at the close of the season is a safeguard against such pests, but it is difficult to persuade a native to adopt even this simple measure of precaution.

Palm Oil and Palm Kernels. The oil palm (*Elaeis guineensis*) is a native of west tropical Africa. In the Congo it grows between latitude 3 degrees north and 6 degrees south. The palm tree produces clusters of reddish-yellow, or brown, fruits which nestle in a great bunch at the root of the palm fronds. From this fruit palm oil is extracted locally, either by the natives or in European factories. Palm oil is orange-yellow or red in colour, and is used by natives for cooking, for anointing the body, for lighting, and for a variety of other purposes. The seed, or 'nut', of the palm remains after the oil has been extracted, much as the stone of a date remains after its flesh has been eaten. Monkeys and parrots, which abound in the forests, pluck the fruit and carry it away with them. Having eaten the fruit they drop the nut as being too hard to crack, and by so doing help to spread palm growth. The oil from the kernels inside the nuts is whitish, and is recovered generally in Europe. There is a considerable export of these palm kernels (*palmistes*).

Natives have cultivated the oil palm for more years than can be told. Now the increase of oil-palm plantations is a matter of government policy, enforced by the law of compulsory cultivation. The idea is not to foster the cultivation of a few palm trees near a village, but rather to establish large plantations of palms in selected areas. The plantations are sited and laid out so as to be easily accessible by

land or water transport or by both. In them native planters are given as large holdings as they and their families can manage. The ideal aimed at is 100–110 acres per family. This procedure of allocating holdings obviously introduces a new element in native land tenure, for the Government allots the land and not the chief. Of course, the produce of a holding belongs to the native in question. Government distributes selected seeds for planting from the State Botanical Gardens at Yangambi, and it is estimated that 36 per cent. of the seed germinate. One of the seeds favoured by an oil-producing company (the H.C.B.) is known as 'Lisombe', named after the locality in which it was found. It produces a thin-shelled nut, and the fruit has a 35 per cent. oil content as against 20–22 per cent. oil content of most other seed. After 5 years' growth young palms bear fruit, after 7 to 8 they are in fair production, and after 10 to 12 in full production. They continue in full production for another 30 or 40 years or even longer.

In Leopoldville province, Mayumbe area, natives planted about 175,000 palms from 1935 to 1937. In the Cataract region of the Bas-Congo and about the Kwango there are native plantations. In 1938 it was estimated that there were 40,000 hectares, or about 156 square miles, of palms under native cultivation. The production of palm oil is very much a native affair, but more will be said on this subject when European agriculture is considered.

Rubber. Practically all rubber collected in the early days of the Free State's existence came from wild climbing vines, shrubs, and other uncultivated plants which grow in the forests. The collection of wild rubber was, of course, the task of natives who, in those days, were forced to produce rubber in lieu of tax. This practice nearly killed the goose which laid the golden egg. In their hurry to collect their quota of rubber natives hacked and slashed the latex-giving vines, which literally bled to death. The Government, when it realised the position, attempted to make the natives re-plant, but this panic legislation did not have the desired effect. Meanwhile experiments were being carried out on rubber trees (not vines). Various species were tried, and on balance it was thought that the *Hevea Brasiliensis* was best suited to local conditions of climate and soil. The Hevea is a large forest tree which may grow as high as 100 feet. It seems hardly the type of tree which natives will naturally plant, cultivate, and tend, yet they are being encouraged to do so. For example, near Bongandanga in Coquilhatville province, 60,000 slips were distributed to, and planted by, natives in 1937.

Coffee. Only in Stanleyville and Costermansville provinces do natives cultivate coffee seriously, for these are the provinces in which Arab influence was paramount forty or fifty years ago. An Arab without coffee is unthinkable, and the Arab habit of cultivating the plant has been handed on to their servants and erstwhile slaves.

Both Robusta and Arabica types of coffee are grown in a small way. Arabica takes five or six years to produce a commercial crop. Robusta, which is essentially an African plant, will grow at lower altitudes, produces more quickly, and its yield is good.

In 1937 there were 750 natives about Yanonge (Stanleyville province) who planted Robusta, with an average of 300 plants each. In the same province, about Bafwasola, there were 440 native planters, about Wamba 1,100, and at Paulis 4,500 (these places are in the northern cotton zone). Near Faradje it was estimated that there were 6,700 native planters, and about Mahagi they cultivated both Robusta and Arabica. In Costermansville province there were nearly 2,000 acres of native grown coffee, both Robusta and Arabica. Much of this coffee is sold to Europeans in berry.

Sesame. Only a comparatively small quantity of sesame is grown. In Coquilhatville province nearly 600 tons were produced in 1937. A certain amount was produced in Elisabethville province also. Gingelly oil is extracted from the seed. The oil is used for cooking, soap-making, and perfumery.

Jute. A certain amount of jute, such as the *Urena lobata*, has been cultivated by natives in the Bas-Congo area. From a first crop of 20 tons production increased to 2,120 tons in 1937.

Silk. It is worth noting here that experiments have been conducted by Government experts on silkworm breeding. It seems to have been proved possible in selected areas of the Congo, and steps have been taken to introduce it. Some villages have been chosen as suitable for the task. What the results will be remains to be seen, but it is not unlikely that Congo will produce silk among its many other riches.

Honey and Beeswax. In the savanna country of the north-east natives have long since been in the habit of collecting wild honey from the decayed trees in which it is stored. Natives also contrive beehives of their own and hang them in trees not far from their villages. The Government, always anxious to develop incipient native agricultural industries, has given bee-keeping a good deal of attention. Native agricultural instructors have been trained in bee-keeping at Kisantu, in the Bas-Congo district, and tour the countryside explaining

modern methods and exhorting all concerned to adopt them. In the hilly country about Faradje and Djugu, in the north-east of the Stanleyville province, there are also native agricultural instructors. A new type of beehive (the Monte-Hawa) has been distributed in the neighbourhood.

European Agriculture

(Figs. 64 and 65)

Types

The term European agriculture may suggest a picture of farms and farm-houses scattered throughout the country much as farms are scattered over the countryside in Europe. But this picture will not square with facts.

European agriculture is sharply divided into two groups, and may be divided into three. In the first place the Belgian Congo still retains some of those large concessions characteristic of the Free State regime, and in more recent times further large concessions for the cultivation of the oil palm have been granted. Some of the original concessionaire companies were concerned with agriculture to a greater or less extent. To-day there are companies such as the Compagnie Foncière Agricole et Pastorale du Congo, Colonisation Agricole au Mayumbe, Compagnie Sucrière Congolaise, Compagnie Cotonnière, and Huileries du Congo Belge—to name a few at random and not in the order of their importance—which are interested in agriculture in one or more of its various forms. Usually they have established plantations, and they may employ European agriculturalists.

In the second place there are non-native colonists, who have taken up land in order to farm. They own, or rent, relatively small plantations, and cultivate coffee, fruit, vegetables, flowers for scent-making, and such other products as a European can manage either by himself, or with a small staff, over and above an adequate amount of native labour. There is a third class of agriculturalist, related to the second, but differing from him to the extent that agriculture is but a second, or third, string to his bow. He may be engaged in commerce, and run an oil-palm and rubber-producing estate as well. He may be a transport driver and plant coffee, and he may combine several businesses with several types of agriculture.

Naturally the farmer colonist who seeks to make a home in the country will wish to live in the pleasantest region that can be found compatible with earning a living. So it is that Costermansville pro-

vince, which includes the healthiest region of the country (Kivu district), contains the most farmer-settlers. Elisabethville, in the Katanga, with its sub-tropical climate and its opportunities in the way of markets, comes next in order of popularity. The highlands of Stanleyville attract some colonists and there are also some in the Bas-

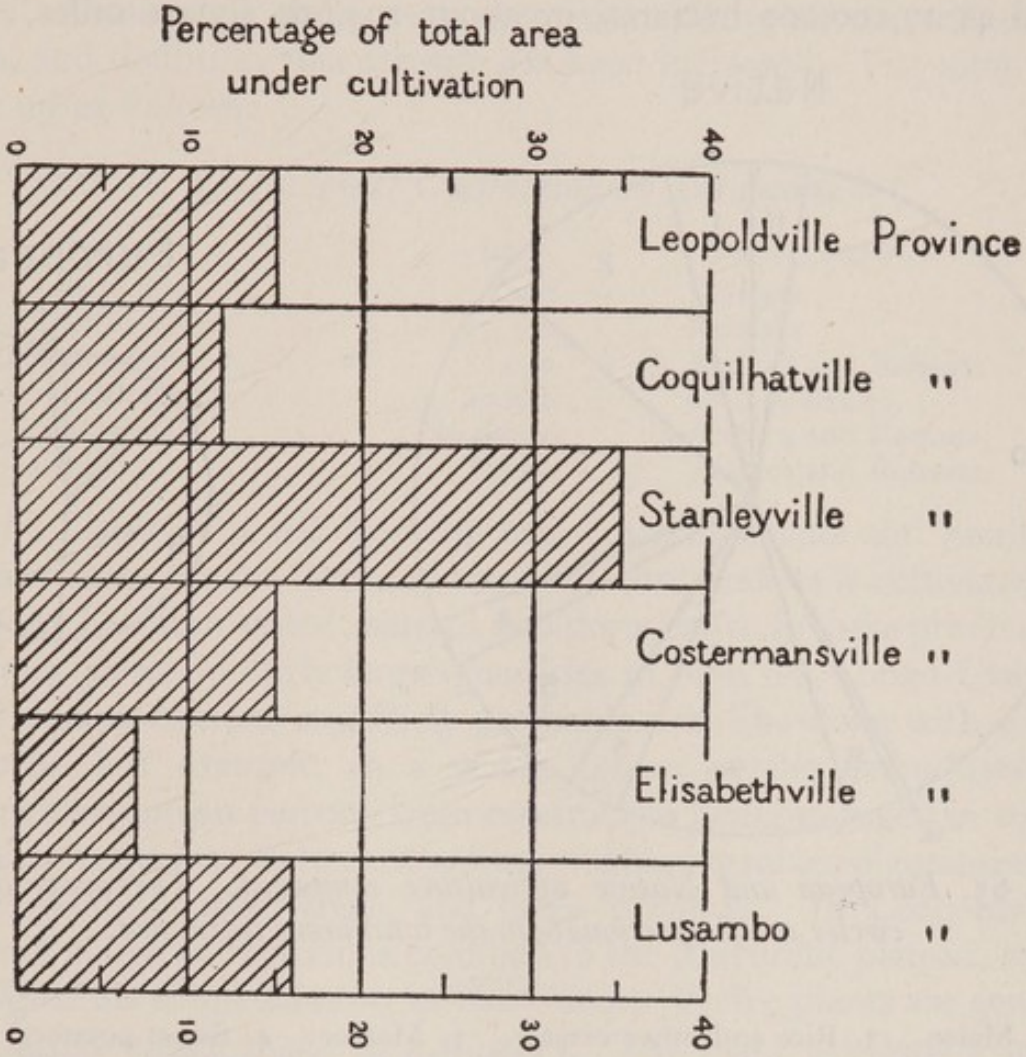


FIG. 64. *Area under cultivation in each province expressed as a percentage of the colony's total.*

Congo region—in Mayumbe particularly. The forest-covered portions of Leopoldville, Coquilhatville, and Lusambo provinces attract very few, if any, of the genuine farmer colonists unless they have some other business which ties them to the area. On the other hand, it is in and about the forest that great oil palm, and rubber, plantations have been, or are being, established. European agriculturalists are employed on these plantations, but they are not settlers.

Alienation of Land

From what has already been said concerning native land tenure it is plain that in the past a settler would have had to come to terms with

the natives before he could occupy the land. Since those days, fifty or sixty years ago, the Belgian Government has become the great landlord of the country. The Government is not, however, the only non-native landlord. The total area covered by grants of freehold when the Congo Free State was annexed by Belgium in 1908 has been calculated as 27,100,000 hectares, or about 104,600 square miles. This

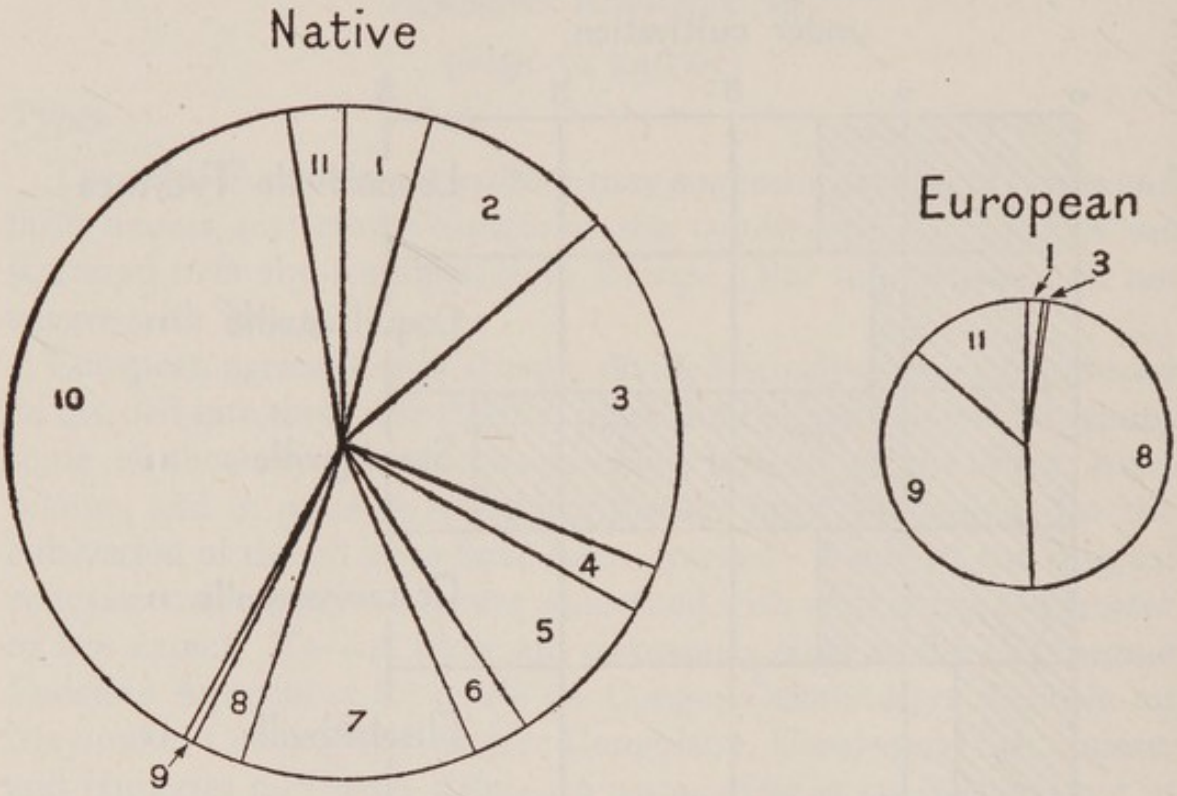


FIG. 65. *European and Native agriculture compared. The areas of the circles are proportionate to the total areas cultivated.*

KEY

1. Maize. 2. Rice and other cereals. 3. Manioc. 4. Sweet potatoes. 5. Bananas. 6. Beans. 7. Ground-nuts. 8. Oil palms. 9. Coffee. 10. Cotton. 11. All other crops.

total was almost entirely divided up between concessionaire companies who still hold considerable areas under certain conditions. A special arrangement has been applied since 1928 to the Kivu region. The Compagnie du Chemin de Fer aux Grands Lacs had a concession which, as revised in 1921, gave it an option over nearly 1,000,000 acres (400,000 hectares). Later the Government was able to reconstruct the company, and the new Comité National du Kivu, which takes its place, and in which government holds a controlling interest, is charged with the development or colonization of a great area. Another change in land policy was made in 1929. It was then announced that no further mining concessions would be granted, and only one-

third of the country was to be open for large and one-third for small agricultural concessions.

European Crops

Coffee. Coffee is cultivated by Europeans in each of the six provinces. About 1932 there were approximately 140,000 acres under coffee, and doubtless this acreage has been increased. The total was made up as follows:

TABLE II. *Coffee under Cultivation by Europeans*

Province	*Acres*	*Type of coffee*
Leopoldville . . .	6,330	Robusta
Coquilhatville . . .	23,500	Robusta
Stanleyville . . .	52,930	Arabica and Robusta
Costermansville . .	42,680	85% Arabica
Elisabethville . . .	No figure	Arabica and Robusta
Lusambo . . .	11,280	Arabica and Robusta

From Table II it will be seen that Costermansville and Stanleyville provinces are the favoured areas and that Arabica is cultivated in both. As has been stated, natives also grow coffee in these provinces. Coffee is grown in fairly large quantities in both the Congo-Ubangi and Tshuapa districts as a fairly profitable side-line along with other produce. For example, in a recent census of the Coquilhatville province seventeen persons were returned as being engaged in commerce, or transport, or in contracting, and having mixed plantations of coffee, palms, rubber-trees, and other products. In Leopoldville province coffee cultivation is confined to the Mayumbe plateau, or to the highlands about Kisantu in Bas-Congo. Coffee plants are generally started under shade in a nursery. The plant develops a long tap-root, and great care has to be exercised in transplanting it. The plants are spaced about 9 to 12 feet apart, and come into bearing two to five years afterwards. Robusta is quick growing, Arabica is slow. Whether coffee be planted at high or low altitudes the bush is far too often attacked by disease and pests. Constant watch has to be kept and spraying is often necessary. Successful experiments have been made with pyrethrum used as a spray.

The average yield of the Robusta plant in the Congo is said to be 500–550 lb. per acre and slightly over half that amount for Arabica, but the latter is the more valuable.

Cocoa. Cocoa is not one of the great products of the Belgian Congo, but a certain amount is cultivated. The work is almost entirely a European enterprise, but a few natives have planted cocoa in

Stanleyville district. By far the greatest amount is grown in Mayumbe, in the Bas-Congo district, where experiments in cocoa cultivation were being carried out as early as 1913. In 1937 the total acreage under cocoa in the whole colony was 14,600. Roughly 9,000 acres were in Mayumbe, 4,000 acres in Coquilhatville province, and the remainder in Stanleyville province. Cocoa is not grown in Ruanda-Urundi, at least not in sufficient quantity for export.

Fruit. Fruit-growing by Europeans is practically confined to Bas-Congo and to Elisabethville province at the other extreme of the colony. The comparatively large European populations of Leopoldville, Elisabethville, and the mining towns, create a demand for fresh fruit which can only be satisfied locally, since soft fruit cannot be hauled over long distances without specially designed transport. Thus the demand for fruit and vegetables which can be grown near a European centre is likely to remain constant, but fruit will not grow everywhere and good fruit-farms are prizes to be sought.

In the south of Katanga, about Elisabethville, the climate is semi-tropical. Apples, peaches, plums, and other European fruits are grown. About Jadotville, 70 miles to the north-east, oranges and strawberries are especially mentioned.

In the Bas-Congo bananas were being cultivated for export to Belgium at the outbreak of the war. Some ships of the Compagnie Maritime Belge were especially fitted for carrying the fruit.

Pyrethrum. A little pyrethrum has been cultivated in the colony. There were perhaps 100 acres of the flower on the highlands to the north-west of Lake Kivu in 1937.

Quinine. Some cinchona was also grown in the same region, chiefly on coffee plantations.

Tea. A mere beginning has been made at tea cultivation in the Kivu region.

Rubber. In 1932 only about 100 tons of rubber were produced in the Congo and rubber plantations were derelict, or in bad condition; yet it had been the principal source of wealth not many years before. Conditions changed and by 1938 there were some 15,000 acres of plantations in good condition and they were all devoted to the Hevea tree. In Coquilhatville province derelict plantations have been re-opened by enterprising companies. At least two new companies were formed in 1937 to cultivate Hevea alone. Companies and individual settlers were prepared to risk all their eggs in one basket and to plant Hevea to the exclusion of all else. As things are it seems more than likely that their faith will be justified.

The following table shows how the cultivation of Hevea has increased:

TABLE III. *Particulars of European Plantations of Hevea, in acres*

Year	*In bearing*	*Young plantations*	*Total*
1934	7,874	3,177	11,051
1935	8,886	4,080	12,966
1936	11,379	2,720	14,099
1937	12,357	2,666	15,023

Oil Palms. Although cultivation of oil palms is largely in the hands of natives, it is anything but their prerogative. Europeans, and particularly big firms such as the Huileries du Congo Belge (or H.C.B.), have large plantations of oil palms, and individual planters add to the total. The particulars given in Table IV show that Coquilhatville and Leopoldville provinces—that is two of the forest-covered provinces—have the greatest areas of palms as they have of rubber.

TABLE IV. *European Oil-palm Plantations, in acres*

Province	*Natural or forest plantations*	*Areas planted up and in production*	*Areas planted up but not in production*	*Totals*
Leopoldville	27,435	13,930	20,805	62,170
Coquilhatville	27,810	24,130	13,480	65,420
Stanleyville	6,040	12,925	11,970	30,935
Costermansville	785	2,315	125	3,225
Elisabethville	..	35	175	210
Lusambo	2,620	6,525	2,315	11,460
TOTAL	64,690	59,860	48,870	173,420

The grand total in round figures is 174,000 acres under oil palms, or roughly 45 per cent. greater than the acreage of palms cultivated by natives.

Ground-nuts. While on the subject of contacts between European and native production, ground-nuts should be mentioned. They have been grown by Europeans as an economic crop, but the acreage tends to decrease:

TABLE V. *Areas under Ground-nuts cultivated by Europeans*

Year	*Acres*
1933	930
1934	333
1935	279
1936	286
1937	380

The largest European plantation was in the Bas-Congo district. It is obvious that European production is only a small proportion of the total.

Livestock

(Fig. 66)

Statistics

At the beginning of 1937 a count of the cattle and pigs in Belgian Congo gave the following return:

Table VI. *Cattle and Pigs, 1937*

Province	*Cattle*		*Pigs*	
	European owned	*Native owned*	*European owned*	*Native owned*
Leopoldville	21,120	85	2,340	67,375
Coquilhatville	1,180	35	2,040	4,800
Stanleyville	17,540	123,450	2,000	1,190
Costermansville	900	95,000	1,200	24,000
Elisabethville	36,925	290	3,360	10,060
Lusambo	39,475	445	500	48,500
Total	117,140	219,305	11,440	155,925

A later return estimates that the cattle owned by Europeans are over 140,000 and by natives 243,000 (Fig. 66). The total number owned by natives is certainly greater than that owned by Europeans. On the other hand, nearly all the native cattle are concentrated in portions of the two provinces of Stanleyville and Costermansville, whereas Europeans have contrived to introduce cattle, in greater or less numbers, into all provinces, fly-infested though some may be. This explains the remark made earlier in the chapter that cattle-ranching is a function of European rather than of native agriculture. The native could not have accomplished the task of getting cattle to Coquilhatville, for example. To do so must have required capital, knowledge, and care.

European Livestock

European cattle in Leopoldville province are mostly concentrated in the Bas-Congo. There are cattle farms on Mateba island in the Congo estuary, at Kolo, and at the Kisantu mission station of the Jesuit Fathers. The stock has been bred from Angola cattle, crossed with Dahomey, Guinea, South African, and even British strains. In

Coquilhatville province nearly all the cattle are the property of the great missions. The cattle are of Dahomey and Guinea stock. As mentioned above, the Institut National pour l'Étude Agronomique du Congo Belge (Inéac) has a farm at Nioka in Stanleyville province in which there are some 1,500 head. At Kerekere in the same province the Kilo-Moto gold-mines company has a farm with over 7,000 head. Both places, Nioka and Kerekere, are in fly-free areas. The cattle are

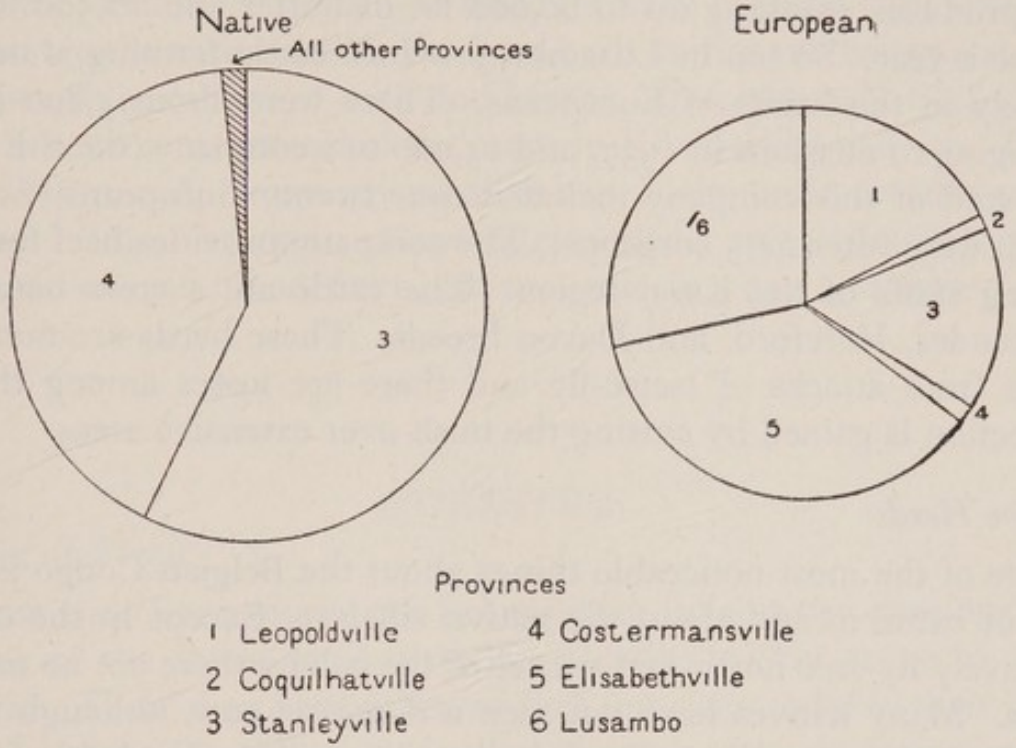


FIG. 66. *Cattle owned by Europeans and Natives. The native cattle are concentrated in the two provinces of Stanleyville and Costermansville. The Europeans have cattle in each province. The areas of circles are proportional to the numbers owned.*

a cross between native breeds and Friesland and Shorthorn. In the highlands of Kibali-Ituri there are several herds numbering between 100 and 700 head belonging to settlers and to missions, while near Stanleyville itself there are one or two dairies which supply milk to the town.

The colonists in the highlands of Costermansville province do not trouble with cattle overmuch as their wants can be supplied by numerous native herds, but some keep a few native beasts for domestic purposes. Nevertheless, in Costermansville province there has been an attempt to breed a higher-grade sheep—a cross between the native sheep, Romney Marsh, and Merino.

In Elisabethville province European enterprise has created a cattle-ranching business. Two ranching companies, directed by veterinary

surgeons, run herds of anything from 15,000 to 20,000 head in order to supply the mining towns with beef. Near the towns of Elisabethville and Jadotville a few settlers keep milking herds of Frieslands crossed with Afrikander-Friesland, but this breed shows signs of degeneracy and efforts are being made to improve it by introducing cattle from Northern Rhodesia.

The Comité Spécial du Katanga (C.S.K.) also has a large dairy and produces anything up to 60,000 lb. of butter and 17,500 lb. of cheese a year. So too in Lusambo province cattle-farming is nearly entirely in the hands of Europeans. There were about 4,800 head belonging to missions in 1937, and 25,000 to a company (the S.E.C.). The staff of this company included over twenty Europeans, five of whom were veterinary surgeons. The company provides beef for the mining staffs of the Kasai region. The cattle are a cross between Afrikander, Hereford, and Devon breeds. These herds are not immune from attacks of tsetse-fly and there are losses among them. Protection is gained by cutting the bush over extensive areas.

Native Herds

One of the most noticeable things about the Belgian Congo is the lack of cattle in and about the native villages. Except in the comparatively fly-free north-east corner of the colony there are no native herds. Many natives have not seen a domestic cow, although they may have seen the wild red buffalo, nor can cattle be herded in forest areas until the tsetse-fly has been mastered. The African goat seems to be immune from trypanosomiasis and from almost any other disease and might help to supply milk if natives would drink it, but it is doubtful if many would touch milk, either cow's or goat's. The Bangala, about Nouvelle Anvers, used to (and some of them still do) consider goat's milk to be an unclean drink because of their belief that it was the spirit or soul of the mother. Natives are not usually without goats, or those hairy African sheep which look so like them. There are also a considerable number of pigs in the villages. All these animals are used for food, and goats, sheep, and pigs roam at will tended by small boys. Probably one of the most prolific causes of trouble in a village is the destruction of crops by small stock.

In Leopoldville province a few years ago it was estimated that there were round about 15,000 sheep, 14,000 goats, and 67,000 pigs owned by natives. Other provinces also contain similar quantities of small stock, but details of the numbers are wanting, except in the case of pigs (Table VI). As for large stock, the cattle-owning tribes in

the Stanleyville province graze their herds in the north-east and east of the Kibali-Ituri district, in the region of Aru on the borders of Uganda, and, more to the south, in the neighbourhood of Lake Albert. In Costermansville province the grazing-grounds are the highlands in the east. The long-horned Zebu breed is common in the north and humpless cattle in the southern sector, but there is an intermixture of breeds. Gold-mine labour camps absorb a good many of the cattle, and there appears to be some trade in cattle with Ruanda. About Aru the native authorities have built dairies and have produced a respectable amount of milk and butter. Unfortunately East Coast fever takes a constant toll of the cattle in Kibali-Ituri district. Even in this favoured climate trypanosomiasis is the most dreaded cattle disease. The Veterinary Department made 30,000 microscopical examinations of blood from native cattle in 1937 and gave 6,000 injections.

FORESTRY

Classes of Forest

From time immemorial the tribes which inhabit the clearings and fringes of the forest have used the portions within range of their villages. There they have gathered fuel, cut poles to build their huts, picked berries, dug up roots, collected snails, and set snares in the game-runs and fish-traps in the streams. By occupation of this sort they have established rights of ownership which are recognized by the Government. Such portions are called Native Lands. Their boundaries, though well understood by the natives, are not demarcated, although the government forestry experts are constantly trying to pin down the natives in the exercise of their rights and complain that indiscriminate use makes the scientific development of the forest impossible.

All the remainder of the forest is considered by the Government to be unoccupied and is claimed as State forest or 'Crown land', but the Governments of the Congo Free State and of the Belgian Congo have from time to time granted freehold or leasehold concessions, sometimes over vast areas, in lieu of cash payments for the construction of railways, or in order to develop a minefield or other area in which the Government held a stake. Generally speaking, the forestry laws apply only to forest which is not a concession area, and concessions are subject to special rules.

Native Lands and Private Forests

Such lands and forests are outside the general scope of the forestry laws. This means that the native owners or the proprietors can fell timber free from any regulation or payment, and that timber firms can purchase trees or logs from native lands. This is a matter of some importance, especially as regards native lands whose boundaries are in dispute, because certain species of trees of commercial value frequently occur on native lands. Such trees are considered as native property when they grow on lands regularly cultivated by natives. The Governor-General, however, has power to make regulations to protect trees serving as boundary marks and for the general control of the felling of timber, and these regulations may apply to any forest whatsoever except areas of afforestation or reafforestation planted by a proprietor or concessionaire on his own initiative. Under this provision measures have been taken affecting native lands. Ebony is protected in the province of Coquilhatville, and felling of the African oak (*Chlorophora excelsa*) is restricted in the districts of Lac Leopold II and Kwango. In the sub-districts of Mayumbe and Bas-Fleuve felling on unregistered lands requires the special written permission of the District Commissioner.

State Forests

Rights of the Public. The rights of members of the public to cut timber in State Forests depend upon the section of the community to which such persons belong. For this purpose the inhabitants are divided into two classes. The first consists of Europeans and other non-natives as well as of natives who are engaged in commerce or manufacture and employ clerks or workmen. These native employers pay a tax which is called Personal Tax. The second class consists of the bulk of the native population who support themselves and their families by farming their own plots or working with their hands at their own trades. Such natives do not pay personal tax.

Native non-payers of personal tax have the State Forests at their disposal. This does not mean that they can burn them down and make farms. Their own lands are reserved for that. Nor does it mean that they have a right to collect fruits, although in practice collection is probably permitted except where the fruits are of commercial value and can be exploited by the Government. It does mean, however, that they can help themselves to what wood they require, whether for firewood or for building their huts or for any other village

use. Moreover, they can cut wood for sale. These privileges do not apply to Forest Reserves or to lands which have been leased by the Government.

The only wood which natives liable to personal tax and non-natives can take without permission is firewood for their own use. This they can also purchase from natives, but if they require timber to enable them to erect buildings, to make furniture, or to fire bricks, they can get a free permit from the Administrator of the sub-district authorizing them to cut timber for construction not exceeding 30 cubic metres (39 cubic yards) and 1,000 cubic metres (1,307 cubic yards) or *stères* of firewood. Permission to work a section of the forest not exceeding 200 hectares (494 acres) may be obtained from the District Commissioner on payment of a fixed fee of 500 francs and payment for the timber according to scale.

To prevent persons from circumventing the law by buying from natives, would-be purchasers of timber intended for resale or for industrial use must obtain from the District Commissioner a licence which costs 500 francs and have also to pay for the timber bought, *pro rata*. As boundaries are conspicuous by their absence, 5 per cent. of the price is paid into the local native treasury in case part of the timber sold may have been taken unwittingly from native lands.

The purchase or collection of wood fuel for steamers requires no licence or permit or payment *pro rata*, but each vessel is taxed on its tonnage. Mission vessels are exempt.

Holders of mining concessions pay for wood fuel according to consumption and for timber for buildings according to number of employees. Payment can be made in a lump sum according to normal use and consumption.

Protective Measures. The District Commissioner or the Administrator of a sub-district can insert special conditions in the felling permits which he issues to non-natives and to natives liable to personal tax, and mention has already been made of the Governor-General's reserved powers to make regulations to control felling in any forest whatsoever.

A District Commissioner can also suspend, in areas decided by him, the free use of timber by natives and non-natives and the issue of free permits to fell trees for building purposes. Felling in such areas can proceed only under cover of a permit of the sort which is issued in respect of timber intended for industrial or commercial use. The result is that the exploitation of forests in these areas is entirely controlled by the District Commissioner, who can impose special

conditions, localize and limit working, and allocate portions of forest for the free exercise of the customary rights of natives not subject to personal tax.

Penalties for breaches of regulations are provided in the shape of imprisonment up to 2 months and a fine up to 2,000 francs as well as forfeiture of permit or licence.

Holders of felling permits or purchasing licences must keep registers and make periodical returns of the quantities felled or purchased. Holders of felling permits must work their areas by sections. They must not fell trees whose circumference at the height of 1·5 m. (4 ft. 11 in.) is less than 1·5 m., except for firewood, nor trees of any reserved species, nor those near watercourses or springs.

A Government Forestry Department was established in 1936 and consisted, in 1937, of a Director (*Inspecteur principal*), 6 Forestry Officers, and 63 Native Forest Guards who are also Game Wardens. The Forestry Officers are technical advisers to the commercial companies holding concessions, as well as conservators of the forests. The duties of the Forest Guards are to prevent or report breaches of the law, collect information, and generally assist in protective measures.

Concessions covering State Forests. The Governments of the Congo Free State and of the Belgian Congo have granted concessions of freehold or leasehold rights over large areas, including forest, as already said. The leases are of two types—*Emphytéose* (a 99 years' lease of the surface with certain mineral rights) and *Superficie* (a 50 years' building lease, confined to surface rights). At common law both classes of tenants have the full enjoyment of the forest, provided—in the case of the tenant for 99 years—that he keeps up the value of the property by working the timber systematically and by replanting. Various restrictions, however, have been imposed by statute.

Concessionaires pay a felling tax, which varies according to the value of the timber and the situation of the land. They must either leave a specified proportion of the timber standing or replace it with plantations of superior value. They are not allowed to fell trees whose diameter at a height of 1·5 m. is less than 50 cm. (1 ft. 7 in.) except for purposes connected with the working of the concession. The concession must be worked by sections or parcels. Concessions measuring over 500 hectares (1,236 acres) must be approved by Royal Decree after submission to the Colonial Council.

The Comité Spécial du Katanga or 'C.S.K.', and the Comité National du Kivu or 'C.N.Ki.', are on a special footing. The C.S.K. administers an area of over 173,000 square miles, somewhat after the

style of a chartered company. With certain exceptions the forestry laws of the colony do not apply; for instance, natives are not entitled to a free supply of wood. The C.S.K. has its own forestry regulations and has full powers to regulate felling by the mines. It has also for some years had its own forestry service. So has the Institut National pour l'Étude Agronomique du Congo Belge (Inéac).

The C.N.Ki. has not the same administrative powers as the C.S.K., but is charged with the development and colonization of over 30,000 square miles of Crown land. This organization also has its own forestry regulations, but the forestry laws of the colony apply more fully than in the case of the C.S.K.; thus, for example, the customary forest rights of natives are safeguarded.

Forest Reserves

It takes time and trouble to settle the various forest rights claimed by natives, and the surest way of establishing State ownership is to create a Forest Reserve.

The first step was taken in 1910 when reserves of over 2,000 square miles were proclaimed round five posts in the Belgian Congo. This decree, however, remained a dead letter. In 1912 another decree established the Governor-General's power to suspend felling rights wherever he judges it expedient. This power was first exercised to create a forestry reserve at Lukolela which no longer exists, its place being taken by a later reserve in the same region created in 1935.

The next two forest reserves were established in 1915 and 1917 between the road from Leopoldville to Kalina and the banks of the Congo. These also have been superseded by later reserves. Another old reserve which still exists is situated on the Kasai, between the rivers Lubi and Binza, and was created in 1919. In 1923 reserves were established at Sangaie and on the west shore of Lake Tanganyika. The latter has been abolished. Finally, in 1924, the existing reserve near Buta was established. The number of reserves at the end of 1924 was therefore seven. After this, reserves multiplied, as the table on the following page shows.

Two reserves cover entire sub-districts. One of these is the reserve embracing Gemena and three other sub-districts in the district of Congo-Ubangi. Its regulations prohibit non-natives and natives liable to personal tax from cutting firewood for personal use or from obtaining free permits to fell timber for the construction of houses. Natives not subject to tax, however, retain all their rights. It is evident that this does not give very effective protection.

The other reserve which embraces whole sub-districts—Mayumbe and another—is situated in the district of Bas-Congo. This is a more effective reserve because it applies to all classes of persons and to all lands except registered properties. It applies, therefore, to native lands, and free collection of wood is permitted only in portions selected by the District Commissioner.

Number of Forest Reserves

Year	*Reserves created*	*Reserves abolished*	*No. at end of year*
1924	..	..	7
1925	5	..	12
1926	3	..	15
1927	7	..	22
1928	4	..	26
1929	8	..	34
1930	4	2	36
1931	40	3	73
1932	14	..	87
1933	5	3	89
1934	5	6	88
1935	6	6	88
1936	15	11	92
1937	14	2	104

To the forest reserves may be added the National Parks and the lands annexed to them. Within these parks trees are absolutely protected. Another area which may be added to the list is the reserve constituted round the Botanical Gardens at Eala. In Katanga the C.S.K. have created numerous reserves. In Ruanda-Urundi three reserves have been established. One of these is on the Congo–Nile watershed, another in the volcanic regions north-east of Lake Kivu, and the third is an island in that lake.

All these reserves which have been mentioned do not afford the same degree of protection. Some are absolute reserves, in which all felling of trees is prohibited, e.g. the island in Lake Kivu, Eala Botanical Gardens, part of Kivu district, and the National Parks. Others—and these are the more numerous—simply restrict the liberties allowed by the forestry laws and place all tree-felling under government control. The exploitation of these forests thus comes under the direct control of the Forestry Service, which can regulate felling to the future advantage of the forest.

Forest Fires

It is the general practice to fire grass and bush, but its advantages are debatable. Savanna owes its characteristics and often its very

existence to the repeated action of fire, and bush fires are the quickest and easiest method of regenerating pastures.

The first measure taken to control bush fires was in 1893, when District Commissioners were authorized to prohibit such fires in places favourable to the growth of forest outside lands subject to private rights. Such orders, however, often remained a dead letter. Recently, ordinances of 1933 and 1937 prohibited all fires except those in connexion with farming operations. Clearings must be made to prevent fires from spreading to houses and plantations.

In certain excepted cases fires have been permitted for other than agricultural purposes, for instance, for health reasons in zones infected with tsetse and mosquitoes, and to provide pasture in game reserves. Finally, every cattle-owner is allowed to fire the old grass of his pastures to an extent proportionate to the size of his herd.

The law is not yet completely effective, but has the advantage of being simple and uniform in principle. It leaves the matter to the discretion of the local authorities instead of imposing a total prohibition, which would be impracticable.

Reafforestation

Compulsory cultivation of foodstuffs and commercial products was introduced in 1914–18. A law of 1936 added tree-planting to the list of compulsory work. The new law gives the District Commissioner, or Resident, power to compel tree-planting. Such planting is usually communal and the proceeds of sales are paid into the native treasuries. By the end of 1936 the area replanted by natives in Ruanda-Urundi had risen to over 34,000 acres, chiefly planted with eucalyptus. There were, however, 370 acres of cypress on the hills, besides a similar area of the durable *Maesopsis eminii* planted on lands infested with white ants. An arboretum has been established at Astrida by the Forestry Service, and plantations have been made along some of the roads.

In the Belgian Congo there has been less reafforestation by native communities. In Kivu district the area replanted measured 3,420 acres in 1936, but there was an extensive programme in hand. In Leopoldville province at the same date, 1,483 acres had been planted by natives in the region of the Channel. Throughout the colony clumps of trees have been planted near villages and some large plantations have been made in the east.

Plantations have also been made by concession companies. Agrifor has plantations of limba in Mayumbe. Exforka and Forminière

have planted teak and other trees, and Otraco have made plantations to supply fuel for their steamers. The C.S.K. has undertaken reafforestation in Katanga, while experimental planting has been carried out at the arboretum in Elisabethville. Finally, plantations have been made by colonists, missions, and at Government stations, both in Ruanda-Urundi and in the Belgian Congo.

Ruanda-Urundi

The Governor-General has power to apply the laws of the colony to the mandated territory, and, under this power, Forest Reserves have been created and reafforestation accomplished, as already stated. The reserves are patrolled by Forest Guards, but a large part of the territory is cattle country, not forest, and the policy has been to interfere as little as possible with native lands. Thus, out of the total area of 20,000 square miles, the State has taken over for its own purposes only 900 square miles, of which 125 square miles form part of the Albert National Park and 700 square miles are within the Kagera National Park. The Albert Park is situated partly in Ruanda-Urundi and partly within the colony. The parks, as mentioned elsewhere (p. 398), are subject to the forestry laws and are, in fact, the strictest kind of reserve, but the rights of the natives living within their boundaries are preserved.



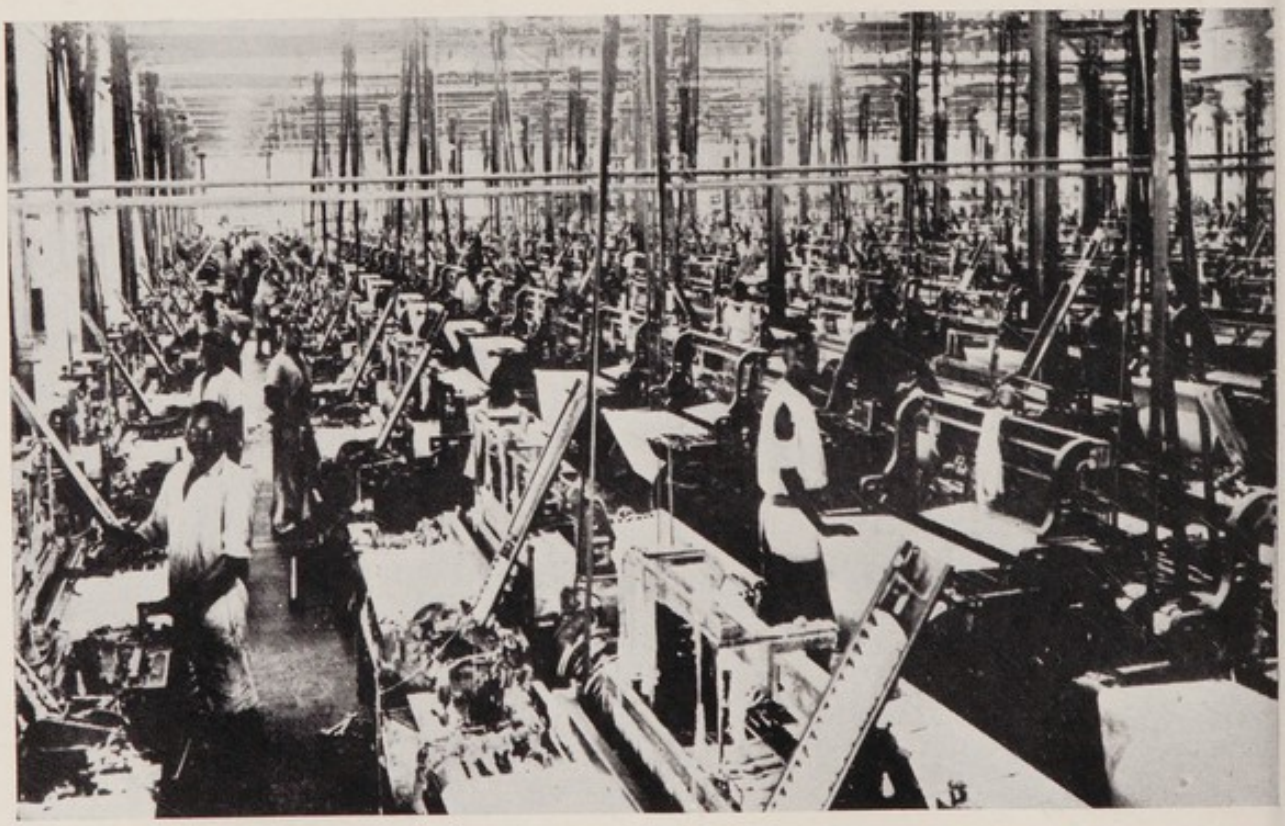
85. *General view of copper treatment plant at Panda, Katanga. Native labour lines in foreground*



86. *Part of the plant of the tin mines, Katanga*



87. *Native Industry. Making floats for fishing*



88. *Leopoldville textile factory. A weaving shed*

CHAPTER XIII

MINERAL ECONOMICS

(Fig. 67)

THE mining industry of the Belgian Congo is of great importance, mineral products to the value of some £12,000,000 accounting for just over two-thirds of the annual export trade of the colony. The relation of the industry to world trade may be observed from the following table, in which is given an indication of the approximate proportion of world output of various minerals attributable to Congo mines.

TABLE I. *Statistics of Mineral Production*

	Production, 1938	*Approximate proportion of world output*	*Production, 1939*	*Approximate proportion of world output*	*Production, 1940*	*Approximate proportion of world output*
Copper, metric tons (smelter production)	123,943	6·0%	122,649	5·5%	156,000	*
Tin, long tons (metal content of ore)	8,820	5·5%	9,663	5·8%	12,232	5·5%
Diamonds, metric carats	7,205,620	62·7%	8,344,765	66·8%	10,900,000	77%
Gold, fine oz.	455,264	1·2%	494,462	1·2%	*	..
Silver, fine oz.	3,117,014	1·2%	2,085,000	0·8%	*	..
Radium and uranium	*	About 60%	*	About 60%	*	Over 60%
Platinum and palladium, fine oz.	1,800	0·3%	*	..	*	..
Lead, metric tons (metal content of ore)	4,625	0·3%	*	..	*	..
Zinc, metric tons (metal content of ore)	4,140	0·3%	*	..	*	..
Tantalum-niobium, metric tons (exported concentrate)	61·2	*	*	..	*	..
Manganese ore (56%), metric tons	7,725	*	*	..	*	..
Coal, metric tons	42,000	..	*	..	*	..

Belgian Congo is also a leading producer of cobalt.
* Data not available.

Accounts of the principal economic minerals are given below.

Copper

The copper-producing districts of the Belgian Congo form part of one of the largest copper belts in the world, extending over a territory approximately 250 miles long and 60 miles broad, oriented in a SE.–NW. direction throughout southern Katanga and Northern Rhodesia. Of this belt, approximately four-fifths lie within the

Belgian colony containing over a hundred copper deposits. The combined Congo and Rhodesian production accounted for 18·5 per cent. of the world output of copper in 1938.

The mines within Belgian Congo are operated by the Union Minière du Haut-Katanga, a company founded in 1906 with rights to

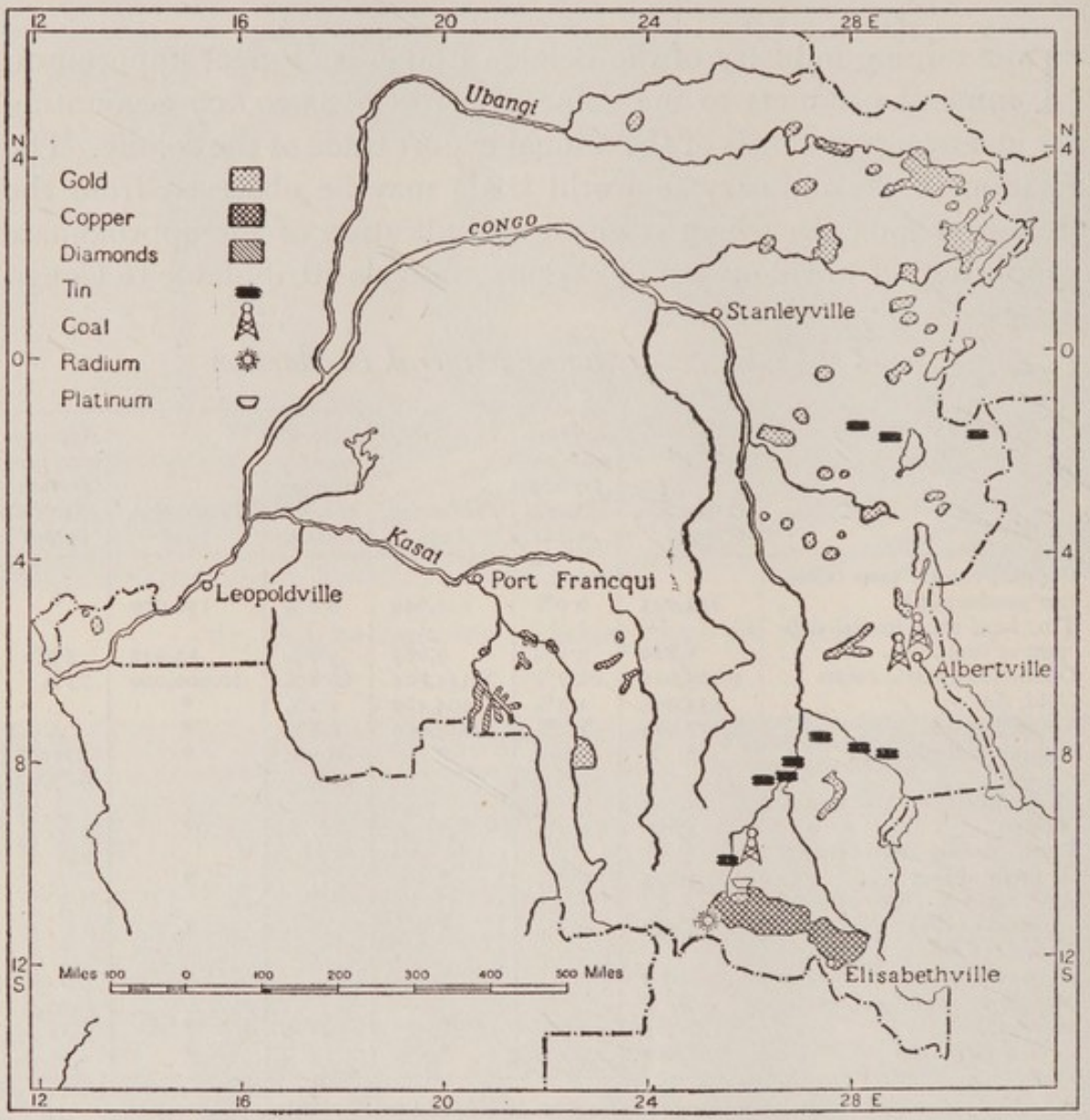


FIG. 67. *Minerals*

work copper until 1990 over an area of 15,000 sq. km. (7,776 sq. miles) and with further concessions (5,400 sq. miles) for tin. Commercial operations were begun in 1911, since when production steadily increased until 1930, concomitant with railway development and the establishment of power plants, concentrators, leaching plant, and smelters. From 1923 (output, 56,221 metric tons) to 1930 (138,949 m. tons) Belgian Congo ranked third in world copper production,

following the United States and Chile. For a few years the Union Minière produced more than any other single company in the world. In the following period of depression production was limited, and the 1930 figure was not surpassed until 1937 (150,588 m. tons) and 1940 (156,000 m. tons). Rapid development of Rhodesian and Canadian deposits has, however, now relegated the Congo to fifth place in the list of producers of copper.

The primary ore in depth is chalcopyrite and bornite (copper-iron sulphides), and averages about 4 per cent. copper; but most of the deposits worked consist of high-grade oxidized ore (principally malachite—basic copper carbonate, and chrysocolla—copper silicate) with a copper content of 6 to 8 per cent. The mineralization is along NW.–SE. fault lines in schists, quartzites, and especially dolomites, of Lower Palaeozoic age. Ore reserves were estimated in 1925 to exceed 75,000,000 tons, with a metal content of 5,000,000 tons. To the south of Elisabethville a sulphide deposit has recently been developed, containing 15,000,000 tons of 4 per cent. chalcopyrite ore, of a similar nature to the exploited sulphide ores of Northern Rhodesia. The primary sulphide ores, though poorer in copper, are easier to smelt than the richer secondary assemblages from the zone of oxidation.

The mines may be divided into three groups as follows: (1) the south-eastern section comprising those around Elisabethville (where the Lubumbashi smelter is situated) and including the Star of the Congo (*l'Étoile du Congo*) and Prince Léopold or Kipushi mines; (2) the central section in the vicinity of Jadotville (where there is a large concentrator and leaching plant), including the important Kambove mines; (3) the western group around Ruwe, where development of deposits believed to contain 2,000,000 tons of copper was reported in 1940. With only one important exception (the Prince Léopold, which has two shafts to a little over 1,000 feet), all the mines are of open-pit type, and the ore is excavated along benches by steam and electric shovels to depths of 100 to 130 feet. To overcome labour difficulties modern machinery, such as drilling machines and portable loading devices, is used throughout.

In 1939 the metallurgical plant comprised eight water-jacketed furnaces and one reverbatory furnace at Lubumbashi, together with reverbatory and leaching-electrolytic plants at Panda-Jadotville, the total annual capacity exceeding 200,000 tons. Even in 1940, a year of record production, these plants were only working at three-quarters of their capabilities. Within recent years the policy of the

company has been to refine the largest possible proportion of its copper in the Congo, instead of exporting matte to the refineries in Belgium (Oolen) and also in the United States (New York City) which formerly dealt with Congo concentrate. Electric power is derived from a hydro-electric plant at Cornet Falls, consisting of three turbo-alternators, each of 15,000 h.p. Coal is railed from the Luena coal-field and from Wankie in Southern Rhodesia.

The provision of adequate labour has constituted one of the major problems of the Union Minière since the inception of the company, for Katanga possessed a very sparse native population, only about five inhabitants per square mile. Of recent years most of the native labour has been recruited from the populous areas of the Lomani and Ruanda-Urundi, respectively 500 and 1,000 miles to the north, regions which possess over 100 natives to the square mile. Although not over-strong, the Bantus from these districts are said to be mechanically minded and proficient in running mine machinery. They receive free transport from their villages to the mining settlements, and back to their villages at the expiry of their contract; the company also provides food, clothing, shelter, medical services, and a guarantee of continued work. Late in 1938 employees were estimated to total nearly 1,000 Europeans and about 13,000 natives, average wages per day of eight hours being approximately £1. 0*s.* 10*d.* for Europeans and 3*s.* 5*d.* for Africans.

Following upon the German invasion of Belgium in May 1940, sales of Belgian Congo copper were placed on a cash-and-carry basis, f.a.s. Matadi or f.a.s. New York. From 1 June to 31 December 1940 the colony exported 32,270 metric tons of matte (all to the U.S.A.) and 59,709 tons of cathode copper or ingots, of which 59 per cent. went to the U.S.A., 30 per cent. to Britain, 8 per cent. to France, and 3 per cent. to other countries. Early in 1941 Britain contracted for 126,000 tons of Congo copper, to be delivered at a rate of 12,000 tons per month.

Cobalt

The Belgian Congo possesses one of the largest deposits of cobalt ore in the world, and in recent years the colony has probably led world output of this metal, although this supremacy has been challenged by Northern Rhodesia, Canada, and French Morocco. Output from the Congo was 708 tons (metal content) in 1929, 674 tons in 1936, and 1,300 tons (Imperial Institute estimate) in 1938.

There are three principal cobalt mines: Luiswishi, 9 miles north

of Elisabethville; Kamwali, 75 miles north-west of Elisabethville; and Mindigi, 40 miles west of Jadotville, all belonging to the Union Minière du Haut-Katanga. The ore, mainly linnaeite and cobaltite (cobalt sulphides) in depth, heterogenite and stainierite (cobalt hydroxides) in the superficial zone, is associated with the copper deposits. After concentration it is smelted at Elisabethville, the cobalt ore being 'slagged off' in a cobalt furnace, and the slag sent to the plant at Jadotville, where it is treated in electric furnaces which produce a copper-cobalt-iron alloy. Formerly this was shipped to the refinery at Oolen near Antwerp; but in 1904, 7,843,828 lb. (3,500 tons) of cobalt alloy, value $3,364,294, were exported to the United States. The erection of a new concentrator at Kabolela and expansion of the roasting and electrolytic plants at Lubumbashi and Shituru were reported in that year.

Cobalt metal is employed principally in cutting-tools, drills, dies, valve steels, magnet steels, &c.; the oxide is used in the glass and ceramic industries, and salts are utilized in the preparation of driers for paints, varnishes, and linoleum.

Radium and Uranium

The occurrence of extensive deposits of uranium ore enabled the Union Minière du Haut-Katanga, with its subsidiary the Société Générale Métallurgique de Hoboken, practically to control the world's radium and uranium supplies for over a decade, and for close on twenty years the colony has been the leading producer of these metals. The ores were discovered in 1913 at Luiswishi and in 1915 at Shinkolobwe, respectively 10 miles north and 120 miles north-north-west of Elisabethville. Production began in 1922, almost wiping out the radium-uranium industry of Colorado and Utah, where at that time the bulk of the world's medical radium was being produced from low-grade carnotite ores. The virtual monopoly of the Belgian operators ceased following the discovery and exploitation of the high-grade ores of Great Bear Lake, North-West Territories of Canada, worked from 1933 by Eldorado Gold Mines Ltd.; but in 1938 the Canadian and Belgian companies reached a five-year agreement whereby world sales were to be shared on a 40:60 basis in favour of the Congo mines.

The principal deposit is at Shinkolobwe, where the ores are pitchblende, torbernite (copper-uranium phosphate), kasolite (siliceous lead uranate), curite (lead uranate), and other minerals, many more or less peculiar to the district. These occur as irregular veins and

disseminations in schistose dolomitic rocks, and are commonly accompanied by cobalt and copper ores. All mining is open-cut and little advance development is carried on: consequently no reliable data on reserves are obtainable. The ore is loaded into sacks, which, after 10 miles' journey by motor truck, are shipped by rail and steamer, passing through Rhodesia and the port of Beira in Mozambique. The crude unconcentrated ore is said to average 3 to 4 per cent. uranium and the recovery of radium is approximately 1 gramme from 30 to 60 tons of hand-picked ore, yielding 7 to 10 tons of high-grade concentrate.

No recent production figures have been published, but up to the end of 1931, 310 gm. of radium had been prepared in the Belgian refinery at Oolen near Antwerp, which, it is believed, could attain a maximum annual output of 60 to 80 gm. in pre-war years. Belgian exports of uranium oxide, principally for use in the glass and ceramic industries, were 1,614 cwt. in 1937 and 2,553 cwt. in 1938. Since the German occupation of Belgium the Congo ore has been shipped to the U.S.A., and has in large proportion been treated at the Port Hope refinery in Ontario. These American imports of uranium ore concentrate from the Congo increased from 5 lb., value $10, in 1939 to 2,400,198 lb., value $2,110,927, in 1940.

Lead and Zinc

Blende and galena (the sulphides of zinc and lead) are associated with copper-iron sulphides in the primary zone of the Prince Léopold and certain other Union Minière mines, while cerussite (lead carbonate), calamine (zinc carbonate), and hemimorphite (hydrated zinc silicate) are found in the zone of oxidation. Production began about 1936, and in 1938 reached 4,140 metric tons (metal content) of zinc and 4,625 m. tons (metal content) of lead.

Silver

Native silver is found in the zone of oxidation of the Prince Léopold and other mines, but details of the mineralogy or metallurgy of the silver ores have not yet been published. Production was first recorded about 1933, and has since been maintained at between two and four million fine ounces. Output for 1938 and 1939 respectively was 3,117,014 and 2,085,000 fine ounces.

Manganese

Manganese is another metal present in accessory, but by no means negligible, proportions in the copper-workings of the Union Minière.

It occurs in the zone of oxidation as 'black ore' or cupro-asbolane, an amorphous powdery mineral consisting of the hydrated oxides of manganese, copper, cobalt, and iron, and forming bodies of considerable size in the Kambove, Ruashi, Shinkolobwe, and l'Étoile du Congo mines. Production of manganese ore (56% Mn) was 27,471 metric tons in 1937 and 7,725 metric tons in 1938.

Gold

The principal gold-mines are all situated in the north-east of the Congo, the largest in the districts around Kilo and Moto, in a concession belonging to the Société des Mines d'Or de Kilo-Moto. This company, with a production of 8,453 kg. in 1938 and 8,648 kg. in 1939, has accounted for from 55 to 62 per cent. of the total output within recent years. Next in importance is the Société Minière des Grands Lacs, producing 15 per cent. of the total, Entreprises Cobelmin and Entreprises Telé, with 6 to 7 per cent. each, and a number of smaller undertakings.

During the early years of gold-mining most of the colony's production was from placer deposits, but within the last decade a number of quartz lode mines have been developed, and now over a third of the gold is produced from bedrock. The placers yield 0·3 to over 1 gm. per cubic metre, and the quartz deposits from 2 to 10 gm. per ton; average figures for the Kilo-Moto mines in 1936 were 0·471 gm. per cubic metre of placer, and 2·36 gm. per ton of quartz lode. Total gold reserves from ore of these grades were estimated in 1932 at 100,000 to 150,000 kg. Kilo-Moto reserves were reported in 1938 to be 66,980 kg.

The placer deposits are usually shallow, and are formed for the most part of decomposed granitic rock more or less in place with some auriferous gravel in the streams. These beds are worked by hand-sluicing, hydraulic mining, drag-lines, and, occasionally, by dredging. The lode deposits are in pyritous quartz-veins cutting schists and granitic rocks, and carrying the highest gold content where adjacent to masses of diorite and diabase.

Production in 1938 and 1939 was 13,502 kg. and 15,388 kg. respectively, and the total output for the period 1903–1939 can be reckoned at about 200 tons. Since 1940 refining of the gold, formerly effected in Belgium, has been carried out in the Union of South Africa.

Diamonds

The discovery of diamonds in different regions of the Congo basin was made successively in upper Lualaba in 1903, to the south of

Bangweulu in 1906, at Kundelungu in 1908 (all situated in Katanga), in the Kilo region in 1908, and in the Kasai zone in 1909. The last discovery initiated the working of what has since proved to be the greatest alluvial diamond field in the world, furnishing to-day 77 per cent. by weight and 24 per cent. by value of the world's output.

Development of the Kasai field, centred around the town of Tshikapa, was begun by the Forminière (Société Internationale Forestière et Minière du Congo) in 1911, and production (15,515 carats) commenced two years later. By extensive reconnaissance the extent of the known diamondiferous country was increased to include a surrounding region of approximately 150,000 square miles—that is, the whole area drained by the north-flowing tributaries of the Kasai-Sankuru river system between 17° and 26° east longitude. In 1920 the Beceka (Société Minière du Beceka), Kasai (Société Minière du Kasai), and Luebo (Société Minière du Luebo) companies were formed, all possessing large mining concessions with favourable prospecting and mining rights under the parent Forminière.

At Kundelungu diamond-pipes similar to those of Kimberley are known; but these are only of academic interest, and the vast commercial deposits of the Kasai field are wholly of alluvial origin. In part they consist of conglomerates of Triassic age and in part they form creek gravels of the modern drainage system and terrace gravels deposited by the streams when formerly flowing at a higher level. Individual deposits vary greatly in size, from those containing a few thousand carats to others containing some millions of carats: the yield per cubic metre is equally variable, but averages about one carat. The primary source-rock of these alluvial diamonds is almost certainly to be found in the pre-Cambrian basement complex, but the stones have not yet been found *in situ*.

Production has advanced from 318,979 ct. in 1920 to 2,518,258 ct. in 1930, 8,344,765 ct. in 1939, and approximately 10,900,000 ct. (over 2 tons), valued at about £1,500,000, in 1940. Of the 1940 output, about 10,000,000 ct. came from the properties of the Beceka company and 600,000 ct. from the Forminière. The rapid increase in production of recent years has largely been brought about by the demand for bort (industrial diamond) for machine tools, only a relatively small proportion of the Congo output being of gem quality.

Tin

The tin mineralization occurs along a zone extending in a NNE.–SSW. direction from the first to the eleventh parallels of south longi-

tude, close to the eastern frontiers of the colony. There are two main producing districts, the first in middle Katanga with exploitable deposits at or near Fundabiabo, Kikondja, Kitengu, Bunda, Kulu, Mwanza, Kitotolo, Manono, Kalamata, and Muika. The second tin-mining district lies partly in Ruanda-Urundi, with deposits at Kuluti, Bugalula, Mumfa, and Katumba to the east of Lake Kivu, partly to the north-west of the lake at Walikale and Masisi. The largest of the producing companies are Géomines, Symétain, Union Minière du Haut-Katanga, Société des Mines d'Etain du Ruanda-Urundi, and Somuki.

The tin is found principally in surface concentrations of disintegrated and weathered rock, usually *in situ*, from 1·6 to over 33 feet in thickness and often some square miles in extent. The yield is commonly from 1 to 6 kg. of tinstone per ton. River alluvium commonly yields 0·8 kg., and the primary pegmatite dykes, from which all these secondary deposits are derived, 6 to 7 kg. per ton. Almost all the production comes from the secondary accumulations, which are mined by hand-sluicing, hydraulic, steam-shovel, and drag-line methods. Probable reserves were estimated in 1932 at 250,000 to 300,000 tons of ore.

Apart from the production of the Société Géomines, which has electrical furnaces to reduce the tin ore to pig tin at its Manono-Kitotolo mines, and which before the war treated about a quarter of the total output of the colony, all the tinstone was formerly exported to the Société Générale Métallurgique de Hoboken in Belgium; but since 1940 most of the metal and concentrates has been diverted to the United States, which imported 4,890 tons of Congo smelter tin, value $5,527,493, in 1940. The Congo producers are members of the international tin cartel.

Production of tinstone has increased rapidly of recent years, from 8 tons in 1905 to 594 tons in 1920, 1,115 tons in 1930, and 12,443 tons in 1937. The metal content of ore (70–74 % tin) produced in 1938 and 1939 was 8,820 and 9,963 tons respectively.

Tantalum-Niobium

Tantalite, columbite, and other minerals bearing tantalum and niobium (columbium), including the radio-active ores samarskite and euxenite, are found associated with the tinstone. Annual exports of recent years have averaged about 60 tons of concentrate with metal content about 58 per cent. The principal uses of these somewhat rare metals are found in the metallurgy of certain types of steel.

Platinum Metals

Platinum and palladium are worked from sandstone (a 'fossil' placer deposit) at Ruwe in south Katanga, the yield being 8 gm. of platinum, with 6 gm. of gold, to the ton. 1,800 fine oz. of these metals were produced in 1938, the platinum:palladium ratio being approximately 1:7.

Coal

Two coal-fields are found in eastern Katanga, the carboniferous strata being contemporaneous with the Ecca beds of the Karroo system (Permian) of South Africa, and characteristically containing fossil leaves of the seed-bearing ferns known as *Glossopteris*. In the Luena basin, a field mined by Charbonnages de la Luena (a subsidiary of the Union Minière), three main seams are present, ranging from 1·3 to 5·0 metres in thickness. In a similar basin at Lukuga, to the west of Lake Tanganyika, there are five seams from 1·2 to 2·0 metres; this field has been developed under the direction of the Géomines company. Reserves are said to be extensive—in the Lukuga field they amount to over 1,000,000,000 tons, and in the smaller Luena basin they exceed 25,000,000 tons; but the quality of the coal is poor, even in comparison with the deposits of similar age at Wankie in Southern Rhodesia. Apart from considerable pyrite, the composition of the coals is as follows:

	Luena	*Lukuga*	*Wankie*
Fixed carbon . .	38·57%	45%	62–65%
Volatiles . . .	28·48%	35%	25–28%
Ash . . .	32·95%	20%	8–10%

Production was 36,000 metric tons in 1937 and 42,000 tons in 1938.

Oil Shale

Oil shales of Juro-Triassic age are well developed in the central part of the Congo basin, between Stanleyville and Ponthierville. Eleven bituminous seams, 0·5 to 1·5 metres thick, are present. The average oil content is about 150 litres per ton, of which 80 to 120 litres, with 8 to 9 kg. of ammonium sulphate, are recoverable. The deposits have not yet been exploited commercially.

Petroleum

Seepages of oil and bitumen have been observed in the Tertiary and Cretaceous sandstones and marls of the coastal zone, in the

Permo-Triassic rocks of the central basin (where the bituminous material is derived from the Stanleyville–Ponthierville oil shales), and in the Tertiary sediments of the rift valleys. In the last region, probably the most promising, an important oil seepage occurs at Mswa on the shore of Lake Albert, mud volcanoes are found to the north of Lake Edward, and gas seepages are known at Kibiro and on Lake Kivu. As far as is known, there has yet been no commercial production of petroleum, and insufficient information is available for a prediction of the potentialities of the colony in this direction.

CHAPTER XIV

TRADE, INDUSTRY, AND FINANCE

The Beginnings

TRADE, Industry, and Finance, as the modern world understands these terms, did not exist half a century ago in the Congo basin. Without its mountain walls and forest barriers, Christians on the west, Moslems on the east, were gradually introducing these new ideas, yet even they had to start with the 'silent trade' in which each side of the barter displayed its wares, in which neither could speak the other's tongue, and which was finally completed by the natives accepting the trade goods and leaving their own behind. North of the basin ran the old pilgrim road to Mecca. South of it lay the slave road along the Congo–Zambezi watershed to Benguela. Some trade, some 'money' ideas, may have spread along them.

Within the basin every Bantu family was sufficient to itself. Housing, crops, fish, and game it procured for its own use, mostly with tools of its own make. What was over—spare gourds, woven clothes or mats, dried fish, or perhaps manioc—was bartered at the local market. Chiefs and middlemen might take their toll, but of buying and selling for profit there was none.

Specialization, except in witchcraft, was not a part of their life, nor did witchdoctors look kindly on other experts of any kind. It is true that tribes, or individuals, might be known as excelling in one or another handicraft such as ironwork or weaving. Even so, such activities would but be added to the normal husbandry. For all that, the amount of goods which changed hands must always have been great. There were, in parts, different forms of token currencies, mainly of salt or iron, but it was the European trader who introduced the 'rod'. A rod was a length of brass wire about $\frac{1}{8}$ inch in diameter and 11 inches or so long and had a fixed value. Some of the heavy brass collars which were worn by the women about Bolobo and Nouvelle Anvers, were valued at 1,000 rods or the price of a bag of salt. They weighed up to 20 lb. and more and were made by melting brass rods down and casting the molten metal into a convenient form. To a native belle a brass collar of this sort was as a diamond necklace to a European lady; it was considered to be a thing of beauty, and it was certainly an outward and visible sign of prosperity.

On Wednesday, 9 August 1877, H. M. Stanley arrived at the settlement of Boma after having crossed the continent of Africa from east to west. He described his return to comparative civilization in these words:

'There are some half-dozen factories at Boma, engaging the attention of about eighteen whites. The residences line the river front; the Dutch, French and Portuguese factories being west of an isolated high square browed hill, and the English factory being a few hundred yards above it. Each factory requires an ample courtyard for its business, which consists in the barter of cotton fabrics, glass ware, crockery, iron ware, gin, rum, guns and gunpowder, for palm-oil, ground nuts and ivory. . . .'

When Stanley arrived at Boma the English 'factory' was the property of Messrs. Hatton and Cookson of Liverpool, who still have one of their stores in the town. There was a business belonging to J. W. Harrison, also of Liverpool; the chief Portuguese trader was A. da Motta Veiga; the French house was in the hands of Daumas-Béraud et Cie.

As had been normal on that coast, before exploration opened up the land, the European trader did not himself penetrate far inland, but sent his native agents, supplied with barter goods. A good deal of trade was done too with natives, coming themselves from as far as Stanley Pool, and bringing commodities which may have travelled far down river to that point.

By 1890 the value of exports from the Congo had risen to about 57,000,000 francs or over £2,000,000. By 1894 rubber and ivory were established as the chief exports, and they continued to hold first place for about twelve years. These were the years of exploitation designed to meet the cost of early development and administration. Actually, as experience proved, not only in the Congo Free State but also in French Equatorial Africa, these vast new and thinly populated countries could only pay, in their early years, by mortgaging the future. Wild rubber-trees were bled to death; elephants slaughtered wholesale. Whilst Congo rubber fell from 83 per cent. of the exports in 1906 to less than half of 1 per cent. in 1937, vast plantations were coming into bearing in the East Indies and Malaya. On the other hand, the real wealth of the country in vegetable oils and tropical products began to show itself. Then copper was discovered in Katanga in 1890–1892, and mining began in 1896. Gold, tin, diamonds, and radium were discovered between 1903 and 1923. Quickly this new land began to take an important place in world economy.

Trade in the Belgian Congo

Imports and Exports

At the present day the chief exports of Congo are gold, copper, precious stones, cotton, palm oil, palm kernels, coffee, and gum copal. Against these and other exports, textiles (calicoes and prints), European luxuries (food, wines, and spirits), machinery, tools, and motor vehicles are imported. The table given below shows the relation of imports to exports over a period of 15 years, and Fig. 68 also illustrates this relationship.

Table I

	Imports		*Exports*	
Year	*Tons*	*Value* £	*Tons*	*Value* £
1923	306,150	4,408,110	143,805	6,237,400
1924	352,460	5,098,875	163,565	4,967,240
1925	516,570	8,609,210	209,870	6,175,890
1926	621,610	8,331,920	200,460	4,698,810
1927	639,325	8,567,700	219,745	6,042,020
1928	724,430	9,298,790	253,560	7,028,050
1929	801,690	11,135,770	295,580	8,276,600
1930	701,040	9,077,580	334,950	8,620,200
1931	350,960	5,913,880	269,060	6,787,800
1932	180,000	3,690,485	202,980	5,305,170
1933	131,280	3,273,300	264,750	5,534,670
1934	160,850	3,489,890	330,780	7,794,100
1935	174,750	3,604,200	392,680	8,264,800
1936	208,970	4,932,250	421,525	10,136,660
1937	373,980	7,761,720	585,985	16,976,075

Before the outbreak of war in 1939 nearly half (42%) of the imports came from Belgium, which during the same period took approximately 75 per cent. of the exports. Figs. 69 to 72 show in what proportions trade was done with various countries during a period of five years (1932–1936).

Balance of Trade

During the period 1929–1930 the total value of the exports reached the high peak of nearly £9,000,000, yet the balance of trade was against the colony. From 1924 to 1930 the value of imports exceeded the value of the exports. During this period the average value of the former varied from nearly £13 to over £16 per ton, and of the latter from about £26 to just over £30 per ton. In other words, the value

per ton of the exports was roughly double that of the imports, but the volume of the imports far exceeded the volume of the exports (Fig. 73). Goods and machinery were imported in quantities natural to its need of development but over-great for the country's power to produce wealth rapidly. There was, indeed, much speculation, and

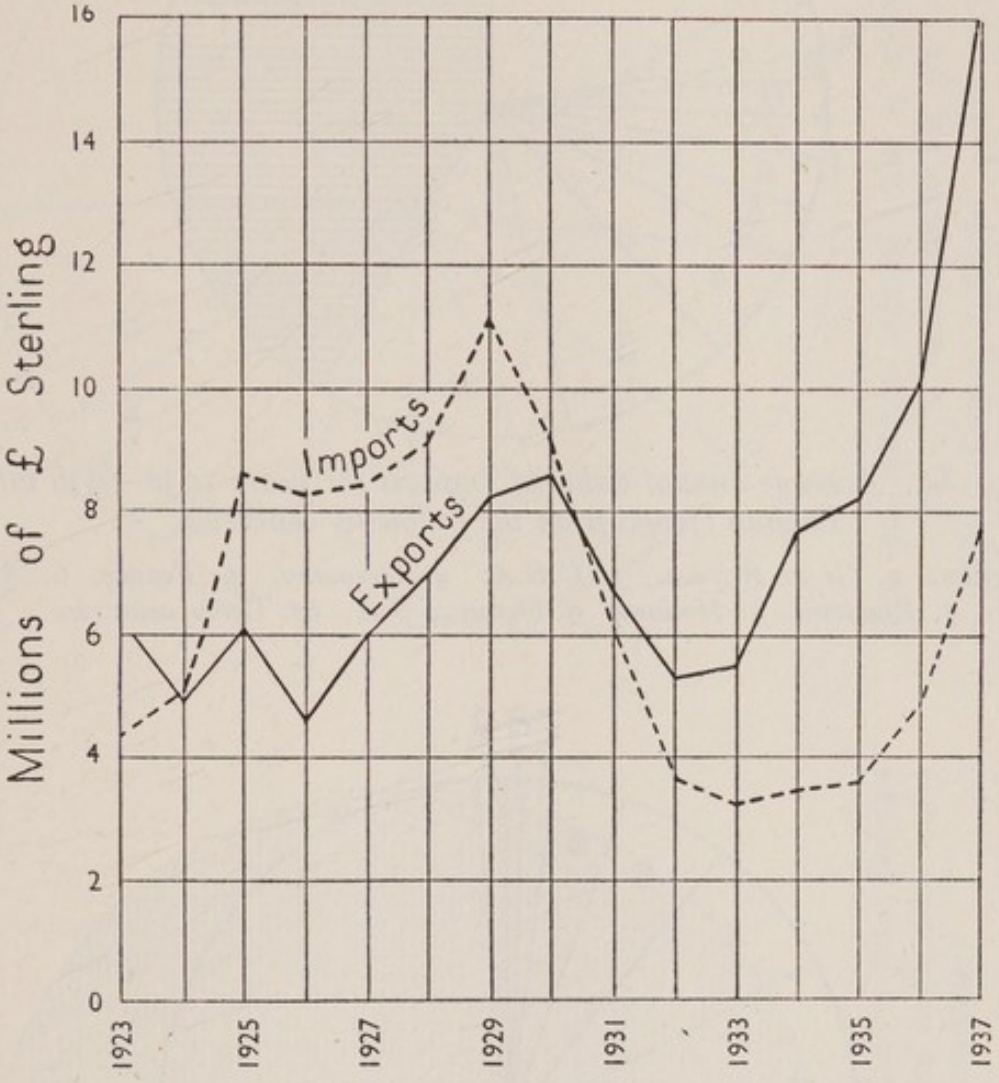


FIG. 68. *Imports and Exports*

at the same time lavish expenditure on luxuries which also helped to swell the volume of imports. The Government ruthlessly pruned its own expenditure, and was obliged to reduce some of its services in consequence. The franc was devalued so that goods sold abroad produced more francs for use at home. As a result some European firms went out of business, individual Europeans left the country convinced that they must seek their fortunes elsewhere, and those that stayed had to economize. These economies reduced the volume of imports and, as the carrying trade is a European business, still more firms closed their doors and dismissed their employees. But

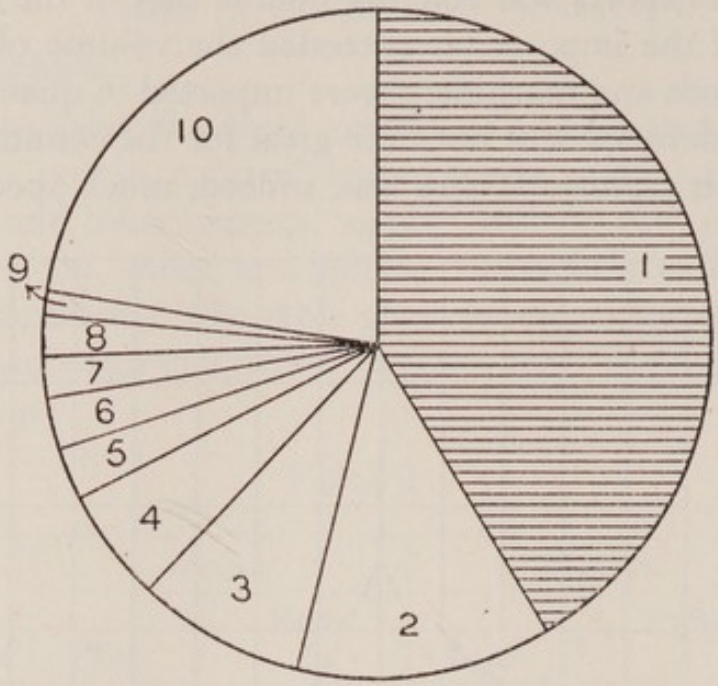


FIG. 69. *Average annual value of Imports for years 1932–1936 into Belgian Congo from the following countries:*

1. *Belgium.* 2. *Great Britain.* 3. *U.S.A.* 4. *Germany.* 5. *France.* 6. *Angola.* 7. *Rhodesia.* 8. *Holland.* 9. *Union of S.A.* 10. *Other countries*

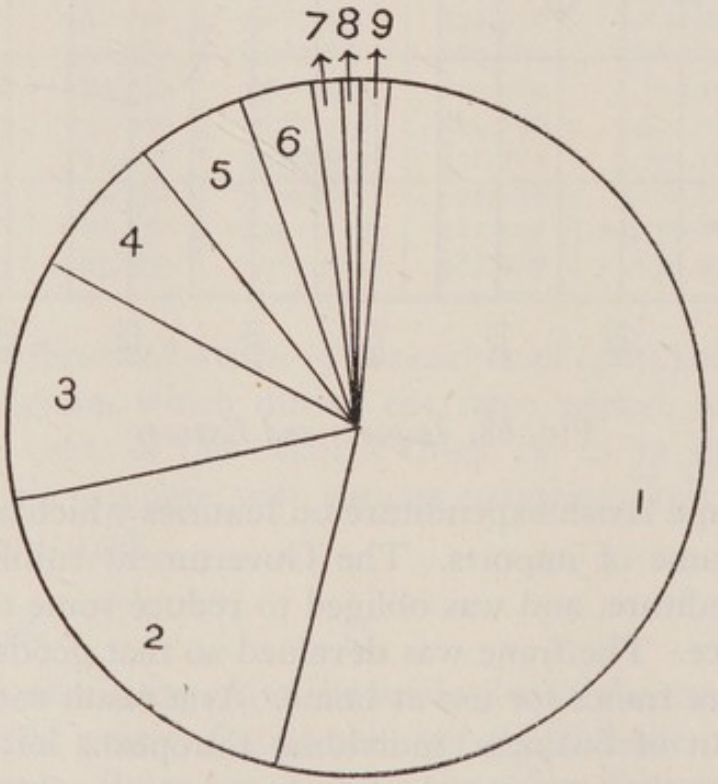


FIG. 70. *Average annual value of specific Imports for same period as Fig. 69*

1. *Manufactured goods.* 2. *Food and drink.* 3. *Machinery.* 4. *Petrol, oils, and grease.* 5. *Motor cars, lorries, tractors.* 6. *Raw materials.* 7. *Railway materials.* 8. *Steamers and boats.* 9. *Other imports*

FIG. 72. *Average annual value of specific Exports to same scale as Fig. 71*

1. *Gold.* 2. *Copper.* 3. *Cotton.* 4. *Precious stones.* 5. *Palm oil.* 6. *Palm kernels.* 7. *Cassiterite.* 8. *Tin.* 9. *Coffee.* 10. *Copal.* 11. *Ivory.* 12. *Timber.* 13. *All other exports.*

FIG. 71. *Average annual value of Exports from Belgian Congo for same period as Fig. 69 (and to the same scale) exported to the following countries:*

1. *Belgium.* 2. *Mozambique.* 3. *Germany.* 4. *French Equatorial Africa.* 5. *Holland.* 6. *All other countries.*

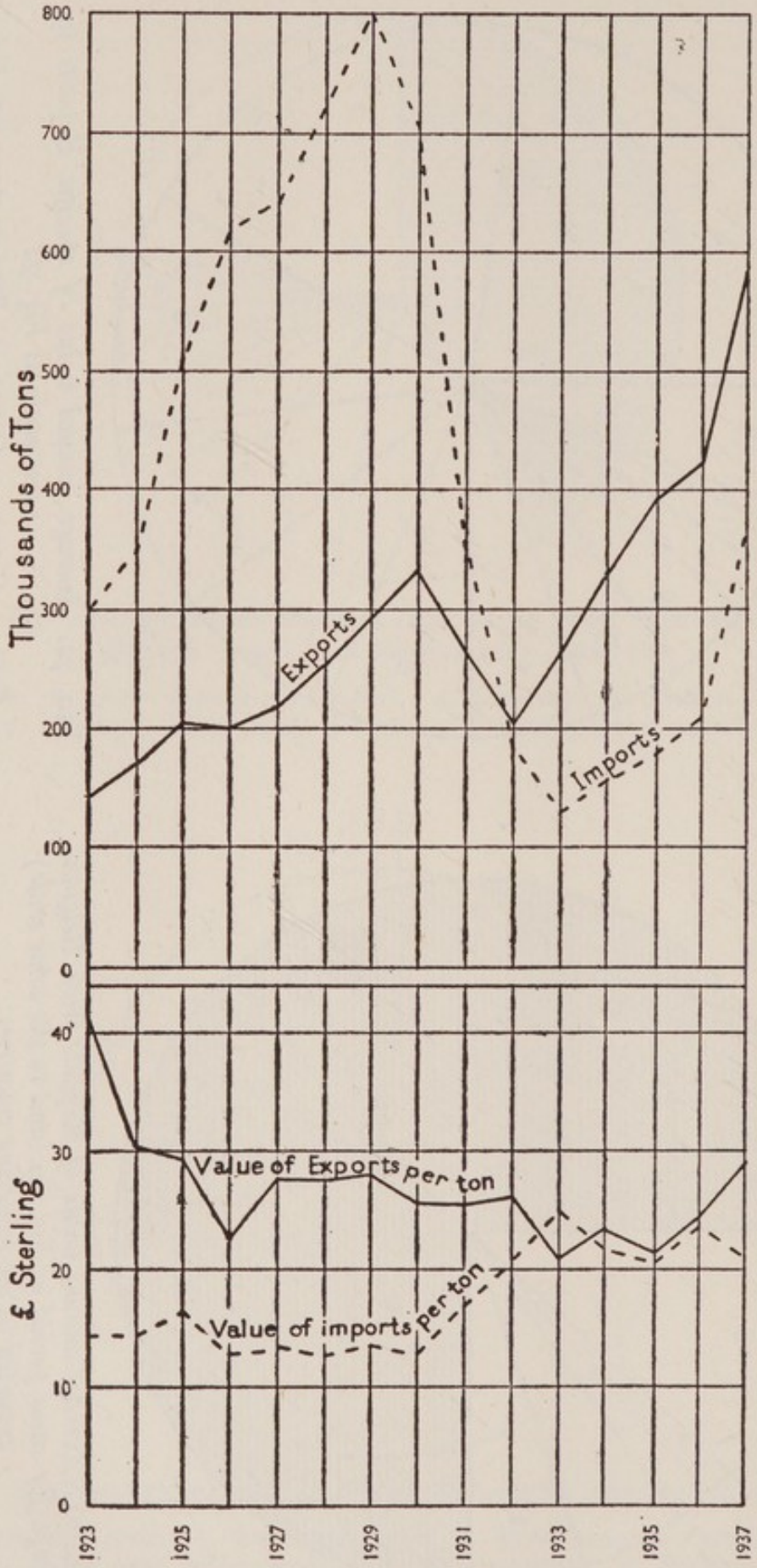


FIG. 73. *Volume of Imports and Exports with value per ton*

the trade balance swung over to the right side. In 1931 there was a balance of over £870,000; in 1932 it exceeded £1,500,000.

In spite of the fact that commodity prices have fallen, the balance has been maintained. The following table, which has been extracted from the *Bulletin de l'Institut des Sciences Économiques de l'Université de Louvain*, illustrates the fall in prices.

TABLE II

Commodity	*Date on which minimum price was reached*	*Percentage of prices ruling in 1927–9*
Palm oil	August 1934	18·5
,, kernels	July 1934	19·0
Sesame	July 1934	26·4
Cocoa	November 1934	26·7
Cotton	June 1932	33·0
Coffee	March 1935	37·9
Copal	March 1935	38·7
Rubber	June 1932	10·4
Ivory	October 1933	27·1
Hides	May 1932	19·1
Copper	October 1934	22·5
Tin	April 1932	33·8
Gold	September 1934	99·9

Traders

The most recent returns available (1937) show that the number of firms and trading concerns were as given in Table III.

TABLE III

Provinces	*European*		*Native petty traders*
	Firms	*Trading establishments*	
Leopoldville	432	1,312	1,678
Coquilhatville	212	1,448	25
Stanleyville	460	2,445	44
Costermansville	377	739	58
Elisabethville	840	1,578	280
Lusambo	156	700	23
TOTAL	2,477	8,222	2,108

Firms may have branches in several provinces and, therefore, the total may overestimate the real number of firms. On the other hand, trading establishments are not, usually, owned by firms but are more often one-man businesses.

At the time that this information was collected 47 per cent. of the

trading establishments were owned by Belgians; the rest were owned by British, Portuguese, Greeks, or Asiatics. It is these firms and trading establishments which stock, distribute, and sell the imports, and which collect, prepare, and finally export the natural products of the country. It is true that native traders take a small share in distribution and retail trade and may, on occasion, collect for firms. Their work is described below, but their activities are of minor importance.

Naturally where wealth congregates so does trade. Firms and traders are most numerous in the mining areas, as Table III shows. Moreover, ancillary businesses, such as road transport and the supply of foodstuffs for native labourers, are most active in those same districts.

The type of distributing and retail trade carried out by these firms can be seen from the list of imports (Fig. 70). Over a period of five years roughly 52 per cent. of the total value of the imports of the country were classified as 'manufactured goods', 17 per cent. as food and wines, 6 per cent. as petrol, and 5 per cent. as motor vehicles. The remaining 20 per cent. included machinery and raw materials. The ordinary business firm or establishment handles manufactured goods, including cotton piece goods, ironmongery of all sorts, clothing, crockery, cutlery, and a multitude of other goods which are necessities to Europeans and are beginning to become so to some natives. Natives now want the cheap imported cotton cloths, enamelled cooking-pots, hoes, lamps, and mirrors, and they like to own iron trunks. Actually cloth of some sort is the largest item of all the imported manufactured goods; and printed cotton cloth (or 'fancy prints') is the largest item among the cloths. It is worth while noting that before 1940 cotton cloth was manufactured in Belgium from Congo-grown cotton. It is only in those towns with a comparatively large European population, in Leopoldville or Elisabethville, for example, that stores which deal in specialized goods such as furniture, motor-cars, sports goods, or electrical equipment have been established. The ordinary store in a small town sells provisions, cloth, petrol, shoes, or ironmongery impartially and takes a share, too, in the purchase and export of the agricultural produce described later.

Native traders are those who open shop in the native quarters of the larger towns. They are licensed traders and must be distinguished from the men and women who bring their eggs and vegetables to sell in the markets. These petty traders sell salt, beads, hoes, cloth, soap, sugar, and the small truck so dear to the hearts of their countrymen. In part they supply themselves with stock from European establish-

ments, and so form a link in the chain of overseas commerce. Trade, therefore, scales down from the undertakings of a firm like Cotonco, which deals in thousands of bales of cotton, to small native-owned shops which carry a stock that can be displayed on an upturned box. More than half of the native traders keep shop in the Bas-Congo district, where their forebears have long been in touch with European ways, and may have been agents of European firms. They have the reputation of being close-fisted and of having some aptitude for business, while the merry, frank, canoemen of the middle Congo seem to have none. There were, in fact, only 25 native traders in Coquilhatville province in 1937.

Agricultural Products (Fig. 74)

Mineral exports, as well as mining activities generally, are described in Chapter XIII. Agricultural and natural products are dealt with by the firms and establishments mentioned above. For example, the purchase of raw cotton, its ginning, baling, and export, is largely in the hands of the Compagnie Cotonnière Congolaise (Cotonco), which was founded in 1920. A Belgian subsidiary firm of Lever Bros., known as the Huileries du Congo Belge, or H.C.B., deals in palm oil and palm kernels. Other large concerns, such as Exforka, Agrifor, and Forminière, also deal in agricultural and natural products. The most important of these products are discussed below.

Cotton. Cotton was the most important agricultural product in 1940. The tonnage exported in recent years has been:

TABLE IV (*See* Fig. 75)

Year	*Cotton*	*Cotton seed*
1933	12,610	30,400
1934	19,770	38,900
1935	23,145	50,000
1936	26,070	59,300
1937	31,675	70,200
1938	35,900*	78,000*
1939	34,020*	74,500*
1940	40,853*	89,000*
1941	39,370*	86,000*

* Estimated.

Palm Oil and Palm Kernels. Nigeria is the greatest palm-oil producing country in Africa, and probably in the Allied world of to-day whilst the Netherlands East Indies are in enemy hands. The Belgian Congo is, however, increasing her percentage of African

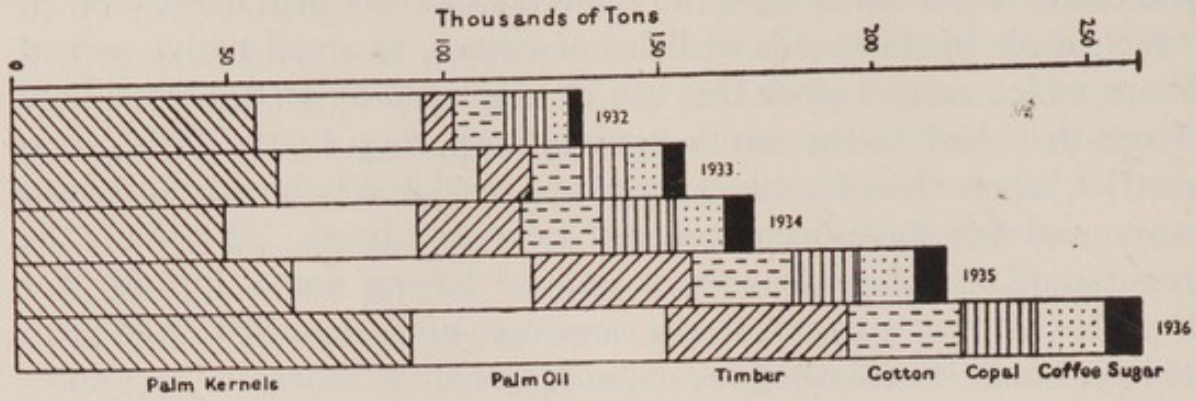


FIG. 74. *Principal agricultural and forest products exported for a period of five years. (By weight)*

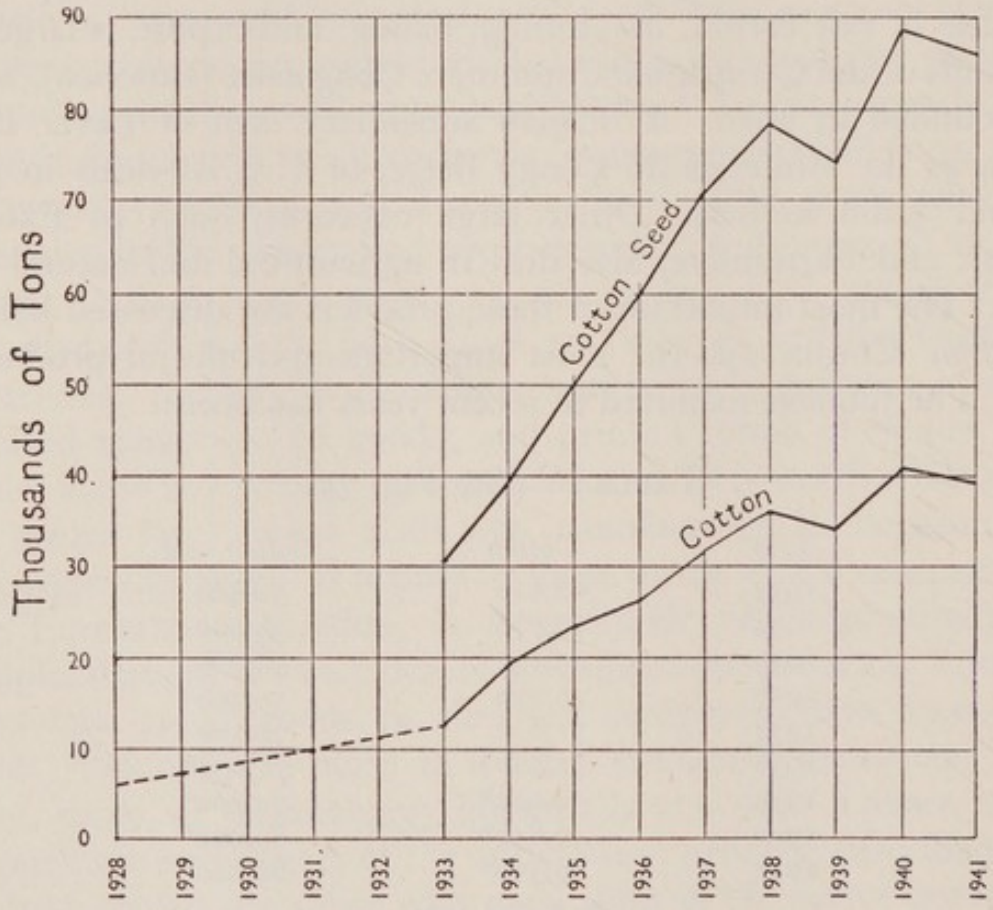


FIG. 75. *Production of Cotton*

production. In 1934 it was 39 per cent. of Nigeria's and 23 per cent. of that of all Africa. In 1939 it was 56 per cent. and 30 per cent. respectively (*see* Fig. 76).

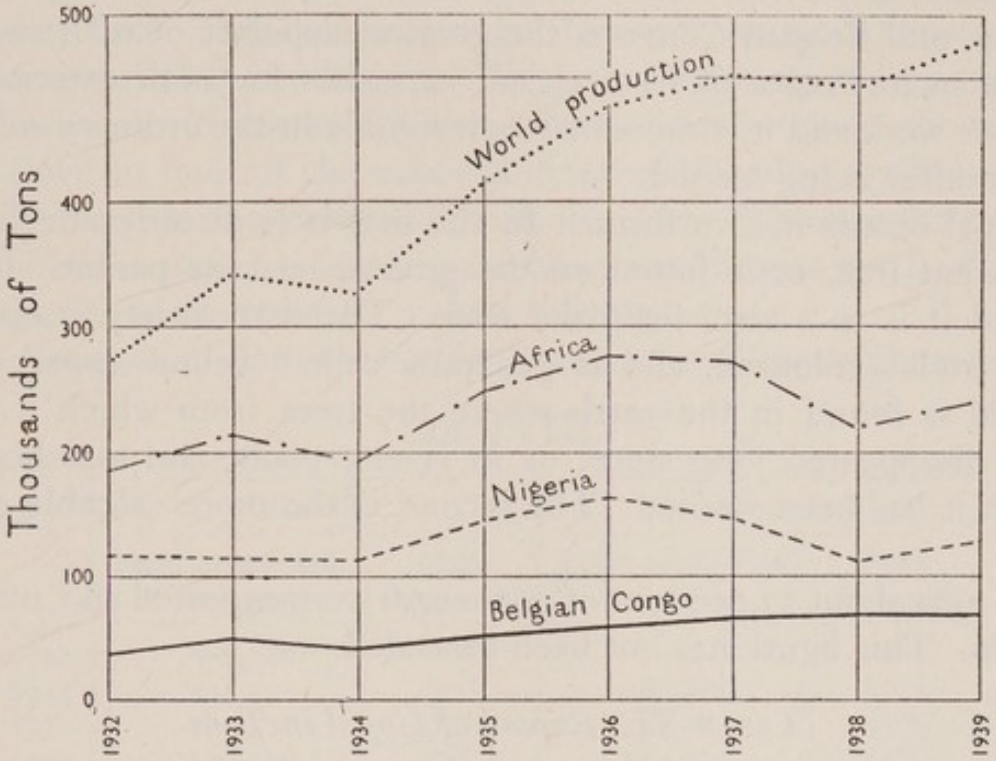


FIG. 76. *Production of Palm Oil*

TABLE V. *Tons of Palm Oil and Palm Kernels produced in Belgian Congo for Export*

	Palm oil	*Palm kernels*
1934	55,600	48,520
1935	52,200	63,970
1936	60,500	91,505
1937	68,900	94,070
1938	70,300	87,300
1939	72,500	83,660

Of the total amount of palm oil produced about 55 per cent. came from the province of Leopoldville, 23 per cent. from that of Coquilhatville, and 16 per cent. from Stanleyville. The remaining 6 per cent. was produced in the other provinces.

Coffee. The total amount of coffee exported from the Belgian Congo in 1940 was roughly 21,760 tons and, until Belgium was invaded, went almost wholly to the mother country. Although this figure represents only 16 per cent. of the production of Brazil, it compares favourably with that of neighbouring African territories. In 1940 Kenya exported some 16,500 tons, Uganda 17,700 tons, and

Tanganyika Territory 16,900 tons. From Ruanda-Urundi 1,300 tons of coffee were exported in 1936, and 2,864 tons in 1938.

Gum Copal, a hard resin which exudes from a variety of trees (*Daniellia*, *Copaifera Guibourtiana*, &c.), is a natural product of the forests, and Belgian Congo is the greatest exporter of it. It is used in the manufacture of hard elastic varnishes for both exterior and interior work and it is more or less insoluble in the ordinary solvents except after being melted.

Copal occurs in two forms. In the first it is directly attached to its parent tree, or is found on the ground near its parent. In the second it is in a semi-fossilized state. The first variety is opaque, often milky-coloured, and is generally called 'yellow copal'. The second is found in the earth where the trees from which it came have disappeared long since, or in rivers, pools, and marshes into which it has been washed. The second is the more valuable of the two.

In 1924 about 13,000 tons of gum copal were exported and, in 1926, 20,000. This figure has not been exceeded.

TABLE VI. *Export of Copal in Tons*

1931	10,167
1932	9,935
1933	10,635
1934	17,490
1935	16,600
1936	19,487
1937	16,583
1938	14,875

Ivory. In 1891 the total amount of ivory exported was 140 tons and represented 53 per cent. of the total value of the exports of the country. In 1916 about 345 tons were exported, but this amount represented only 6 per cent. of the total value of exports. In more recent years the amounts have been:

TABLE VII. *Ivory exported in Tons*

1932	160
1933	122
1934	106
1935	212
1936	197

On an average about 160 tons of ivory are exported annually as well as a certain amount of worked ivory in the shape of bead necklaces and carved objects. It is calculated that 12–18 elephants must

be destroyed to produce one ton of ivory, or, in other words, over 2,000 elephants disappear annually.

Timber. Congo forests contain valuable trees, yet for the most part geography is against their use far outside the locality in which they are felled. The Belgian Congo thus escapes much destruction of her forest timber and is mercifully spared a corresponding amount of soil erosion. Nevertheless, the export of timber from the colony ranks third in bulk of the exportable natural products, although in value it is about one-twelfth of that of cotton. The greater part of the timber for export is felled in the Mayumbe forests north of Boma and brought to that port by a short railway.

The production, for export, of timber in the colony is given below.

TABLE VIII

	Baulks		*Scantlings*	
	Total production, cubic feet	*From Mayumbe*	*Total production, cubic feet*	*From Mayumbe*
1932	807,300	..	..	..
1933	411,135	77%	386,485	57%
1934	814,570	56%	521,280	75%
1935	1,063,150	83%	593,570	55%
1936	1,766,410	94%	707,180	81%
1937	3,196,000	94%	56,963	83%

Ebony is exploited in Coquilhatville province, and 300 tons were exported, chiefly to Germany, in 1937.

Sugar. Sugar-cane was first planted by Europeans as a trade crop in 1925. In 1929, 820 tons of sugar were produced at Moerbeke-Kwilu on the Leopoldville–Matadi railway, to the south-west of Thysville. Production has increased so much that a great part of the colony's demands for sugar has been supplied locally, and an export trade has also been built up.

Ground-nuts. In recent years an export trade in ground-nuts has been fostered and improved until it has reached some importance. In 1933 only 330 tons of nuts were exported, but by 1937 the total had risen to 7,020 tons. Belgium itself absorbed practically the whole of this amount. Many tons of ground-nuts are also sold to European, Indian, and Arab merchants, who, in turn, sell to the great employers of native labour in the mining or industrial areas.

Rubber. In 1937 a total of 1,540 tons was exported. This included some collected from wild vines in the forests, a practice which had been discontinued for six years. Fig. 77 illustrates the

trend of rubber production, and shows how the collection of wild rubber declined and how the production of plantation rubber has taken its place.

Rice. In 1937, 33,760 tons of paddy, or unhusked rice, were produced in Stanleyville province and were sold for local consumption within the colony. Rice is also cultivated about Bumba (Coquilhatville province), and it is now possible to export from this region

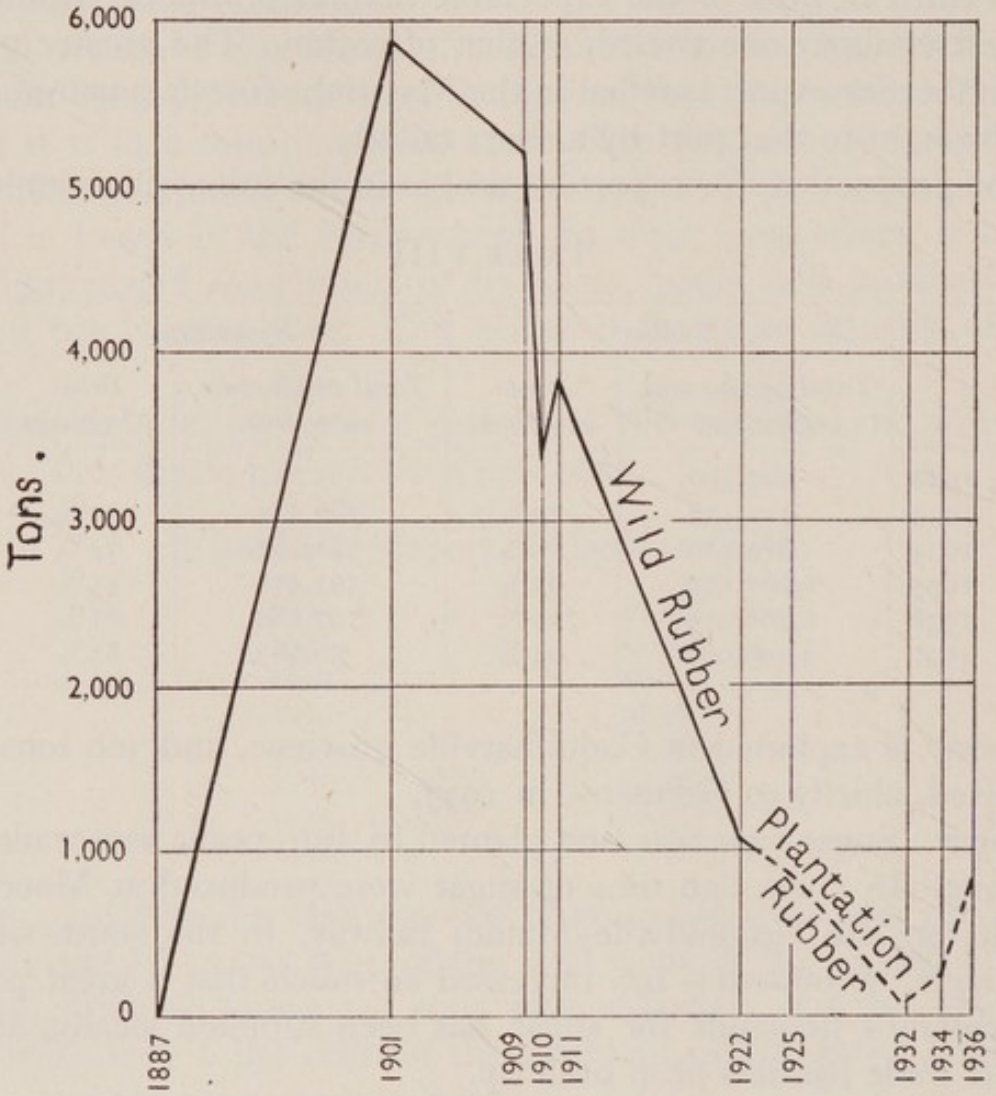


FIG. 77. *Production of Rubber*

to Europe. In 1937, 1,150 tons, valued at £8,815, were exported; almost all of this went to Belgium.

Hides and Skins. The prevalence of the tsetse-fly prevents cattle-ranching over a great part of the Belgian Congo, but goats are to be found everywhere. Exports, not important in hides, include, therefore, a noticeable trade in skins. An average of 135–140 tons of hides and skins, valued at some £50–55 per ton, has been exported annually during recent years.

Maize. Maize, the staple food of many natives, is mainly an article of internal trade. The province of Lusambo is the great maize-producing and exporting area. The province of Elisabethville is a great importing area, and 12,500 tons of maize were sent from Lusambo province to southern Katanga in 1936. The Union Minière alone bought 1,200 tons from the province of Costermansville, and there were other large purchases. In spite of the great amounts consumed by native growers themselves and the quantity absorbed in the country, there has been a residue left over for export:

TABLE IX. *Export of Maize*

	Tons
1933	71
1934	440
1935	1,775
1936	4,150
1937	11,650

In 1937 Angola exported about nine times as much as the Belgian Congo. Maize is also produced in Ruanda-Urundi, partly for home consumption and partly for sale.

Cocoa. Cocoa is not one of the chief products of the Belgian Congo, but a certain amount is produced. Indeed, 1,440 tons, valued at £34,700, were exported in 1936, almost entirely to Belgium. This total is, however, little more than 1 per cent. of the export of cocoa from Africa during the same year.

Sesame. A very small quantity of sesame is cultivated by natives. In 1936, 290 tons were exported.

Manioc Flour. Manioc flour is exported to Belgium, where it is used in the manufacture of starch. By 1937 the export figure was 2,450 tons. Manioc flour is also exported from Ruanda-Urundi.

Jute and Fibres. Besides the enterprises mentioned above a certain amount of fibre-producing plants such as *Urena lobata* are cultivated by natives in the Bas-Congo area. From very small beginnings production increased to 2,120 tons in 1937.

Bananas. In recent years an effort has been made to develop an export trade, to Belgium, of bananas grown in the Bas-Congo. This is purely a European venture, and has met with some success in spite of the handicap of so long a voyage. Similar ventures are the cultivation of tea, pyrethrum, and quinine in the Kivu district. But these, and a recently started perfume business, were little more than in their initial stages at the beginning of the war.

Trade in Ruanda-Urundi

Firms and Traders

Trade in the two mandated provinces is conducted on somewhat different lines from those common in the Belgian Congo, for an eastern rather than a western element is noticeable, and in 1937 more than half the business establishments were Indian or Arab. The official report for 1937 remarks: 'As in the past, Arabs and Indians have been nearly the only people who trade direct with the natives. . . .' In other words, more than half the commerce in the two provinces is purely native trade in which salt, cloth, brass wire, hoes, beads, and other small things are sold for cash, and native produce, such as beeswax, hides, and beans, is bought. It is the commerce of small business, the profits of which are sufficient to satisfy the very limited wants of the Asiatic traders, whose small single-room shops often serve also as living-room and bedroom.

There are, of course, European firms which deal mainly with agricultural exports. The more important are: Compagnie de la Ruzizi, which deals in cotton and has its own coffee industry; Compagnie du Kivu, with large coffee interests; Messrs. Dessai; Compagnie Agricole de l'Urundi; Société Générale d'Exportation (Genex); Société des Plantations et Cafeières de Kigali. Finally the Government manages the coffee undertakings of the Société Coloniale des Produits Tannants et Agricoles (Protanag).

TABLE X. *Businesses in Ruanda-Urundi, 1937*

Nationality	*Firms*			*Small shops or stores*		
	Ruanda	*Urundi*	*Total*	*Ruanda*	*Urundi*	*Total*
Belgian	14	22	36	47	59	106
Greek	1	15	16	3	31	34
Portuguese	1	5	6	4	11	15
Other European	7	9	16	10	13	23
Arab	30	50	80	42	78	120
Indian	20	38	58	27	54	81
Other Asiatic	2	1	3	2	1	3
	75	140	215	135	247	382

Of the total number of firms 138 were commercial businesses, 14 were concerned purely with agriculture, 38 were industrial, and the remainder had interests in two or all of these lines.

The small shops or stores are often one-man affairs as in the Congo.

Volume of Trade

The business conducted by firms and small stores in both provinces can be gauged from the following table, which shows the total amount of imports and exports during a period of five years.

TABLE XI

	Imports		*Exports*	
Year	*Tons*	*Value* £	*Tons*	*Value* £
1933	5,705	231,700	6,090	131,530
1934	8,883	282,960	7,840	271,280
1935	7,510	264,280	10,225	309,180
1936	12,196	392,790	17,570	505,900
1937	14,862	574,230	20,854	642,220

It will be seen from the above that trade is no more than modest. In 1937 the value of exports amounted to 3½ shillings per head of the population, and of imports 3 shillings per head. In Uganda, for the same period, exports were about £1 a head and imports 12 shillings.

Exports and Imports

Exports. The following table shows the chief exports for the same period as the previous table.

TABLE XII. *Principal Exports in Tons*

	1933	*1934*	*1935*	*1936*	*1937*
Hides and skins	1,310	710	1,536	1,250	831
Cattle	1,395	610	698	5,622	4,725
Sheep and goats	650	340	564	2,277	685
Dried meat	..	..	164	310	207
Native produce: beans, peas, manioc, grains	1,280	2,475	1,990	1,657	3,910
Cotton	314	439	512	519	837
Coffee	119	252	630	1,308	2,880
Butter	..	3	8	19	32
Palm oil	40	36	53	26	97
Palm kernels	200	127	84	96	267
Tobacco	..	15	32	60	55
Sisal	..	..	..	35	144
Beeswax	27	19	32	34	30
Cassiterite	423	980	1,220	1,545	1,220

It is obvious that the products of native fields and herds have formed the bulk of the exports, although their value is less than that of the minerals.

TABLE XIII. *Principal Imports in Tons*

	1933	*1934*	*1935*	*1936*	*1937*
Foodstuffs	274	505	589	413	587
Wines, beer, and spirits	149	115	116	212	163
Building materials:					
(*a*) Timber	114	55	16	17	49
(*b*) Lime and cement	547	457	320	202	615
Motor vehicles and spares	71	95	191	206	342
Petrol and lubricants	610	778	903	1,334	1,480
Kerosine	212	161	116	129	195
Cotton piece goods	575	627	605	940	1,082
Blankets	93	99	128	162	241
Clothing	83	29	36	66	101
Salt in bags	1,460	1,442	1,586	1,957	2,130
Hoes and matchets	110	188	177	236	435
Steel and iron goods	290	483	500	1,028	1,255
Other metal goods	128	193	185	459	563
Bales and bags	71	70	102	179	200

The quantities of common salt, cotton piece goods, blankets, kerosine, hoes, iron and metal goods all point to a native trade.

INDUSTRY

Scope

In spite of its mineral wealth, the Belgian Congo is still predominantly agricultural. In 1938 official estimates showed that slightly under 14 per cent. of the native male inhabitants were wage-earners, and of these only a half were employed in European industries. At the same time, the number of Europeans engaged in commerce and industries was estimated to be somewhere about 7,000. When the immense size of the country is considered, and the dispersal of the Europeans over its length and breadth, it will be realized that there cannot be many great industries after the mines have taken their share of man-power. Other industries, of which palm-oil production and cotton-ginning are the most important, are relatively small. Native industries, other than agriculture and the production of economic crops, are still less remarkable, if indeed they can be called industries at all. Natives can, and do, carve canoe paddles, weave fishing-nets or fibre cloth, mould cooking-pots, and make many household utensils, but these accomplishments are a normal part of the everyday life of a peasant rather than industries. A man weaves a fishing-net, or fashions a paddle, because he wants a net or a paddle, and not because he wants to sell the work of his hands. Very few men or women make their living only by exercising their crafts, and even blacksmiths cultivate a plot of land in addition to

working at their forges. There is a native industry of drying and smoking fish about Bolobo, but it is spasmodic and uncertain. A man may work at the business one year but decide to do something entirely different the next. Native industries, such as they are, are one-man affairs for the most part; two or three natives will combine to carry out a piece of work, e.g. to smelt iron or to cut down a tree, but the partnership is rarely permanent. In short, the only organized native industry is the cultivation of economic crops.

European Industries

Table XIV, which follows, shows the European industries shortly before the outbreak of war. Most of them were in the provinces of Stanleyville, Elisabethville, and Leopoldville; the smallest number in Lusambo province. Industries connected with mining are not given in Table XIV, nor are they here described. They will be found in Chapter XIII, and Table XIV lists them.

TABLE XIV

Industry	Provinces						Total
	1 *Leopold-ville*	2 *Coquil-hatville*	3 *Stanley-ville*	4 *Coster-mans-ville*	5 *Elisabeth-ville*	6 *Lusambo*	
Agricultural produce, treatment of							
Coffee factories	24	36	101	46	6	22	235
Cotton ginneries	1	17	57	9	7	27	118
Milling (grain)	3	..	1	5	5	7	21
Palm-oil factories:							
(*a*) Power Mills	42	23	16	3	..	6	90
(*b*) Hand Mills	130	48	1	..	..	52	231
Rubber treatment	5	9	7	..	..	1	22
Sundry	17	14	10	2	5	8	56
Building trades							
Brick and tile works	2	48	44	16	25	6	141
Others	14	5	11	20	46	..	96
Chemicals, production of							
Chemical works	..	..	..	..	2	..	2
Clothing trade							
Tailors	8	..	22	2	15	..	47
Electricity, gas, water, and power							
Electricity undertakings	11	4	17	5	31	20	88
Gas or water supplies	9	1	1	..	10	1	22

TABLE XIV (*cont.*)

Industry	Provinces						Total
	1 Leopold-ville	2 Coquil-hatville	3 Stanley-ville	4 Coster-mans-ville	5 Elisabeth-ville	6 Lusambo	
Engineering							
Engineering work-shops and forges	12	8	21	4	25	11	81
Motor vehicle repair shops	15	4	32	6	22	11	90
Railway repair shops	5	..	3	2	9	4	23
Shipyards	8	3	1	2	2	..	16
Food-supply							
Bakeries	17	2	14	5	30	..	68
Butcheries	7	5	10	6	14	7	49
Dairies	3	2	16	6	81	..	108
Hotels	17	4	24	11	29	3	88
Others	15	4	9	9	74	5	116
Minerals, treatment of							
Concentration plants	..	..	1	..	3	1	5
Crushing plants	..	..	6	..	3	..	9
Selection and wash-ing plants	..	..	7	1	5	3	16
Reduction and ore treatment plants:							
Copper	..	..	..	..	3	..	3
Gold	..	..	7	2	..	..	9
Sundry	..	..	..	5	..	..	5
Petrol and mineral oil	4	..	..	..	..	..	4
Printing and photo-graphy	12	8	7	4	11	..	42
Tanning and leather trades							
Shoemaking and tan-neries	2	..	5	2	10	..	19
Textiles							
Cotton mills	1	..	..	..	..	..	1
Rope manufacture	..	..	..	..	..	1	1
Timber-working trades							
Carpentry, cabinet making, &c.	14	59	51	10	22	4	160
Saw-mills	16	19	18	3	6	4	66
Others	2	36	13	12	2	..	65
Soap boiling, &c.							
Soap-works	7	5	6	1	10	5	34
Various	7	15	5	1	12	1	41

Agricultural Industries

Cotton. Raw cotton, produced almost entirely by native agriculturalists, is cleaned, separated from its seed, and packed or baled for

export at one of the ginneries which have been built in the cotton zones; many of them are owned and managed by Cotonco. The ginneries produce annually about 26,000 tons of cotton. It may be useful to note that 100 lb. of raw cotton produces 30–35 lb. of ginned cotton and about 65 lb. of cotton seed. In previous years quantities of seed were shipped to Belgium, where the oil was expressed and the residue converted into cattle cake. Three cotton-seed crushing mills have now been built in the Congo. One, at Elisabethville, produces about 400 tons of oil a year.

Palm Oil. The H.C.B., besides trading in palm nuts, maintain the largest palm-oil producing plants in the country. The factories are established at Leopoldville, at Alberta (near Bumba), and at Elisabetha (near Basoko on the middle Congo). In the Kasai region the same firm have plants at Leverville, near Kikwit, and at Brabanta near the junction of the Kasai and Sankuru. A sixth operates at Flandria on the Momboyo river in Coquilhatville province. The output aimed at by all H.C.B. factories is 20,000 tons of palm oil per annum, but this figure is a maximum and has not been reached. The 231 plants which are described in the Belgian official records as 'Huileries de palme à bras' (and which appear in Table XIV under 'Hand mills') are small and privately owned.

Other Vegetable Oils. Besides the palm-oil plants three factories for crushing palm kernels have been built. Previously it was considered more profitable to send palm kernels to Europe than to crush them in the country: heavy freight charges for oil were avoided, and the cake, a by-product of the kernels, commanded a ready market in Europe. There are two crushing plants in the Congo, one of which is in Elisabethville province. Its output is absorbed by the mines. In 1937 there were only five ground-nut oil mills in the whole colony; two of these were in Elisabethville province. The oil is used locally for cooking purposes and for issue to native labourers.

Coffee. The number of coffee factories appears to be high. The greater number are described as *traitement à bras*, and are small affairs such as will be found on any coffee plantation. Many can hardly be dignified by the name of factory.

Hydro-electric Plants

The principal hydro-electric plants are at Mwadingusha (Katanga) and at Sanga (Bas-Congo). They are both powerful plants with an output of 214,169,300 kWh. and 5,340,000 kWh. respectively. The former is owned and managed by Sogefor, the latter by Colectric.

Other electrical undertakings are not of similar importance. They vary in size from a plant which can supply a small town to an installation at a ginnery.

Ship- and Boat-building Yards

Ship-building or repair yards are mentioned in Chapter XI. The Chanic yard at Leopoldville should be referred to here. A type of sternwheel steamer has been evolved for use on the Congo which, although fundamentally the same as all sternwheelers, yet differs from them in certain important respects. The Chanic yard specializes in building and repairing such steamers. The ship-building industry is, therefore, local in the sense that it does not build for export, although skill and plant are not lacking even for that. Chanic can employ up to 1,200 men per annum. It can build vessels up to 1,000 metric tonnes capacity, weighing 295 tons.

Manufactures

The manufactures of the Belgian Congo are few, and the products are more often absorbed locally than exported. There was one notable exception; before the outbreak of war, sugar was made and exported to Belgium. The following notes give some particulars of the most important manufactures.

Textiles. In 1928 a cotton spinning and weaving mill was built at Leopoldville, and in 1937 it turned out 12 million yards of cloth. Since then it has been extended and has been made almost self-sufficient by setting up machine shops to cast, finish, and repair loom parts. In 1942 it was turning out materials for tropical uniforms, bandages, dressings, cotton-wool, sheeting, and tent canvas for the Belgian Colonial Army and the Fighting French Forces. The piece goods are sent to French territory to be made up.

Sugar. Small quantities of low-grade sugar for local consumption are manufactured in a primitive manner by a few Arabs and Indians in the east of the colony, but the total produced is small. Some years ago the Compagnie Sucrière Congolaise built a sugar factory at Moerbeke-Kwilu in the Bas-Congo district and experimented with local sugar-cane. In 1929 mechanical crushing and a refining plant were added and export began. This was the only *sucrerie* recorded as being at work in the colony in 1937.

Chemicals. The Société Générale Industrielle et Chimique du

Katanga (Sogechim) produces chemicals at its works at Jadotville. In 1937 it produced roughly:

200	tons	sodium chlorate.
11,650	,,	sulphuric acid for use in reducing copper.
120	,,	calcium carbide.
320	,,	powder and explosives.
60	,,	palmitine from palm oil.

This company should be able to supply all the mining explosives needed in the Belgian Congo.

Cement. There are two cement mills in the country, one at Lukala in Bas-Congo district and the other at Lubudi in Katanga. The output of the first is in the region of 15,000 tons and of the second 10,500 tons per annum. The total was not quite sufficient for the needs of the Congo in 1937; some cement had to be imported.

Lime. Lime is burned where limestone occurs and where there is a demand. In the whole country about 10,700 tons were produced in 1937; this quantity was absorbed locally.

Bricks and Tiles. Of 141 brick, or tile, works given in Table XIV, over 100 are classed as 'Briqueteries à main'. Hand-moulded bricks are produced for local consumption at 100, or more, small brickyards, any one of which may close down when the local demand is satisfied.

Finance in the Belgian Congo

The Charter

The Belgian Congo financial system is controlled by the Colonial Charter, which provided for the retention of certain rights of the Belgian Parliament. It is, therefore, possible for Belgian public opinion to express itself on the financial, as well as on all other, affairs of the Congo. Thus the budget, or more properly the budgets, for there are two, are submitted annually to the Belgian Parliament, and only after they have received its assent are they legally operative. This measure of control is found neither in French nor in British colonies, where parliamentary interests in colonial finance are met by making provision for a debate on the vote for the maintenance of the Colonial Office. There can be no doubt that the Belgian system is thorough, but it causes delays. Budgets sometimes fail to secure the sanction of Parliament before half the financial year has gone by, whilst the budget of 1936 does not seem to have been passed until 1937. In order to avoid the troubles of such delays efforts were made to introduce biennial rather than annual budgets, but this expedient proved unworkable and had to be dropped. The two budgets in

question are: (i) Ordinary Revenue and Expenditure; (ii) Extraordinary Revenue and Expenditure. It is usual in British colonies to combine the two, but foreign Powers usually adopt the same system as the Government of the Belgian Congo.

In general, Extraordinary Budgets are devoted to expenditure met by loans, subventions, and lotteries, or by funds other than current revenue. In theory the two budgets are quite distinct and should be balanced separately; in practice adjustments are sometimes made between the two. In the Belgian Congo there does not appear to be a statutory limit to the Extraordinary Budget, but it is always kept within reasonable bounds. Both budgets are prepared and submitted to Parliament at the appropriate time. If Parliament has not passed the budgets five days before the opening of the new financial year, the ordinary budgetary processes remain in abeyance and a special credit is opened at the Ministry of the Colonies to meet immediate financial obligations. This credit is good for three months, and can be renewed for like periods until Parliament has decided the fate of the budget. Meanwhile, the Governor-General has power to approve extraordinary expenditure in case of urgent need within the colony, but beyond this he is powerless to go. The colony cannot, itself, issue a loan, or guarantee the capital, or interest, on a loan unless empowered to do so by Parliament.

Budgets (Fig. 78)

The table which follows shows, for six years, the revenue and expenditure of the colony as approved by the Belgian Parliament. The

TABLE XV. *Budget Totals*

	Revenue		*Expenditure*	
Year	*Ordinary*	*Extraordinary*	*Ordinary*	*Extraordinary*
1933	Frs. 357,914,000	..	Frs. 725,757,000	Frs. 63,647,000
	£ 3,008,900	..	£ 6,101,300	£ 534,070
1934	Frs. 366,626,000	Frs. 165,000,000	Frs. 723,429,000	Frs. 55,350,000
	£ 3,388,440	£ 1,524,900	£ 6,686,000	£ 511,560
1935	Frs. 365,359,000	Frs. 196,584,000	Frs. 685,503,000	Frs. 44,534,000
	£ 2,510,120	£ 1,351,200	£ 4,709,700	£ 305,970
1936	Frs. 423,227,000	Frs. 210,271,000	Frs. 677,729,000	Frs. 1,393,828,000
	£ 2,880,000	£ 1,430,900	£ 4,612,000	£ 9,485,000
1937	Frs. 522,439,000	Frs. 8,520,700	Frs. 665,487,000	Frs. 60,350,000
	£ 3,566,140	£ 58,160	£ 4,542,570	£ 411,945
1938	Frs. 716,981,000	..	Frs. 766,981,000	..
	£ 4,879,000	..	£ 5,219,300	..

actual revenue and expenditure differed but slightly from these figures. For convenience, totals have been given in pounds sterling as well as in francs, but it must be remembered that the value of the franc fluctuated considerably during the period under review. Figures for the revenue of 1934 and 1935 illustrate this point.

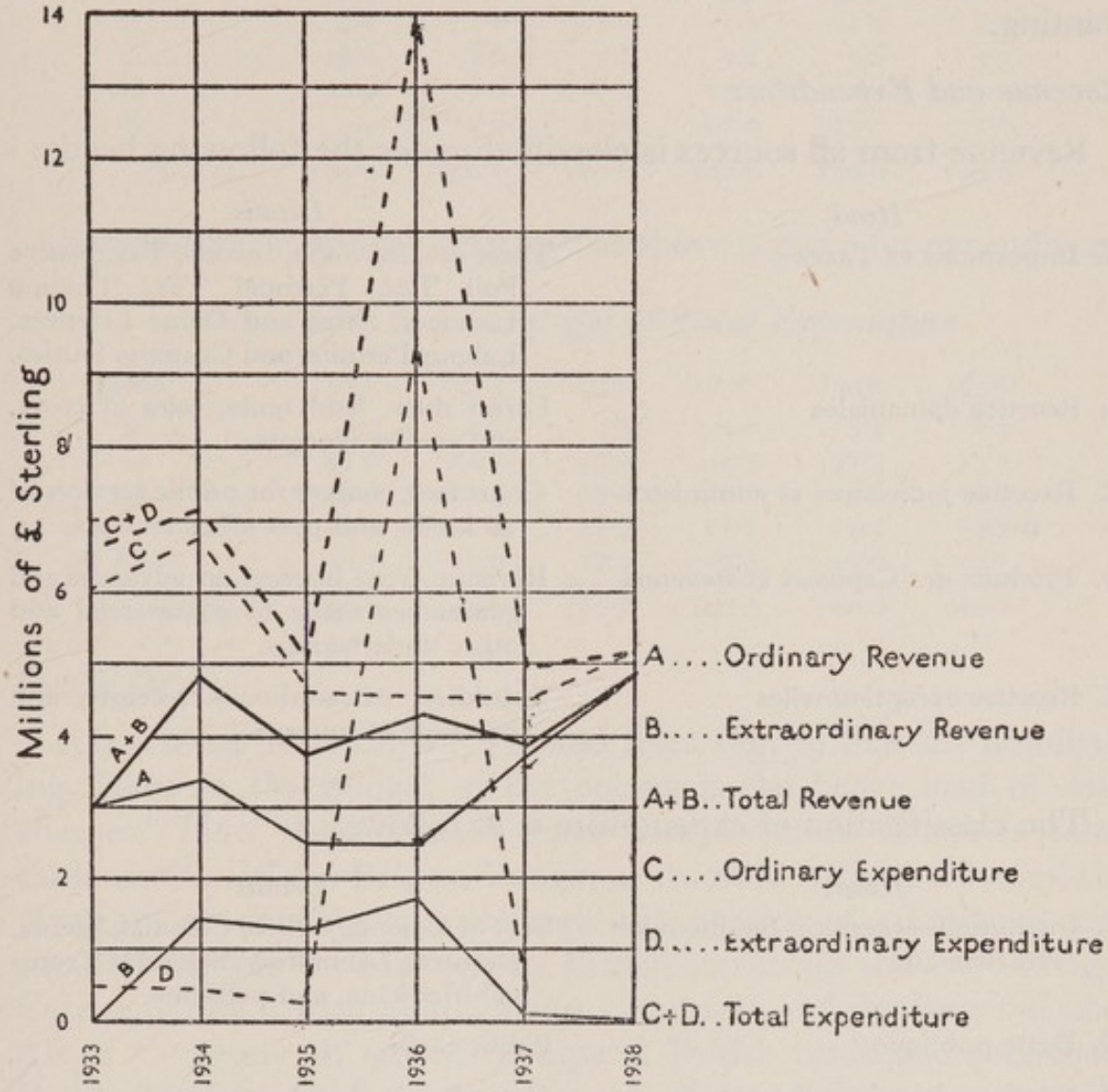


FIG. 78. *Revenue and Expenditure*

The information given in Table XV is also shown diagrammatically in Fig. 78, which emphasizes the fact that over a period of years the revenue collected in the Belgian Congo has been less than the expenditure. The deficit has been met in part by the grant of a 'Metropolitan Subsidy' or non-refundable grant by the Belgian Parliament in respect of charges for administration in Brussels. The cost of the Colonial Office, its agents, and the other colonial services in Brussels falls normally on the Congo budget and not on that of the home

government as it does in Great Britain. The amount of the subsidy was over £1,000,000 for each of the years 1934, 1935, and 1936. In 1937 it was reduced by one-half, and the budget for that year was the last to include a 'Metropolitan Subsidy'. In its place a Colonial Lottery was introduced. This lottery is, or was, widely advertised on the Continent and it appears to have been a success, but details are wanting.

Revenue and Expenditure

Revenue from all sources is classified under the following heads:

Head	*Details*
A. Impositions et Taxes	These are, *inter alia*, Income Tax, Native Poll Tax, Personal Tax, Trading Licences, Arms and Game Licences, Labour Permits, and Customs Duties.
B. Recettes domaniales	Forest dues, land rents, sales of ivory, and similar receipts.
C. Recettes judiciaires et administratives	Court fees, charges for public services of all kinds, and post office receipts.
D. Produits des Capitaux et Revenus	Revenue from interest on advances and guarantees made to commercial and other undertakings.
E. Recettes exceptionnelles	Subsidies, extraordinary receipts, and proceeds of lottery.

The classification of expenditure is as follows:

Head	*Details*
F. Institutions et services fonctionnant en Belgique	Cost of Colonial Office, Colonial Agents, Research Laboratory, School of Tropical Medicine, and pensions.
G. Dette publique	Public Debt.
H. Service administratif, judiciaire, et Force Publique	Cost of central and provincial administration, secretariat, judiciary, police, prisons, and colonial army.
I. Services sociaux	Education, grants-in-aid, and public health.
J. Services d'ordre économique	Public works, posts and telegraphs, transport, waterways, agriculture.
K. Dépenses exceptionnelles	Urgent public works and supplies. Up to the year 1936, this item was included in the next (L) and was met by loans.
L. Dépenses extraordinaires	Grants made to commercial and other undertakings.

Revenue. Of the above five sources of revenue the first four are fairly constant in yield, as the following table shows:

TABLE XVI. *Percentages of Total Revenue*

Head	*1933*	*1934*	*1935*	*1936*	*1937*	*1938*
A . .	72·0	52·0	51·6	54·0	59·9	62·8
B . .	2·0	1·0	1·0	1·0	1·2	1·2
C . .	16·0	8·6	7·2	5·8	5·6	5·3
D . .	10·0	7·2	8·8	12·2	20·3	23·1
E . .	..	31·2	31·4	27·0	13·0	7·6
TOTAL .	100·0	100·0	100·0	100·0	100·0	100·0

Expenditure. A similar table to that above is given for expenditure:

TABLE XVII. *Percentages of Total Expenditure*

Head	*1933*	*1934*	*1935*	*1936*	*1937*	*1938*
F . .	4·1	4·0	4·3	4·8	5·5	6·3
G . .	40·0	44·2	43·6	42·5	37·3	33·3
H . .	23·5	22·4	23·2	23·7	25·0	26·0
I . .	12·7	11·8	11·7	11·8	13·2	13·7
J . .	19·7	17·6	17·2	17·2	19·0	20·7
TOTAL .	100·0	100·0	100·0	100·0	100·0	100·0

Public Debt

It is evident from Table XVII and from Fig. 79 that the dominating factor in the budget of the colony is the heavy load of debt charges. How these charges have been incurred demands some explanation. In the Belgian Congo, as in other African colonies, the principle of development through the agency of companies was adopted early in its history. In British territories the Royal Niger Company, the British South Africa Company, and the Imperial East Africa Company all served to expand British trade and influence. In French Equatorial Africa an epoch of concessions to companies was inaugurated in 1899. In the Congo the Compagnie du Congo pour le Commerce et l'Industrie was founded in 1886, and established a series of subsidiaries which obtained concessions. But in the Congo the period of exploitation by holders of large-scale concessions came to an end with the decline in demand for forest rubber (a demand, be it remarked, which has again become important since the beginning of the present war), though a certain number of these concessions still remain. It has been estimated that there were in 1932 approximately 200 companies in the Belgian Congo, the majority of which were controlled by four financial groups: the Société Générale,

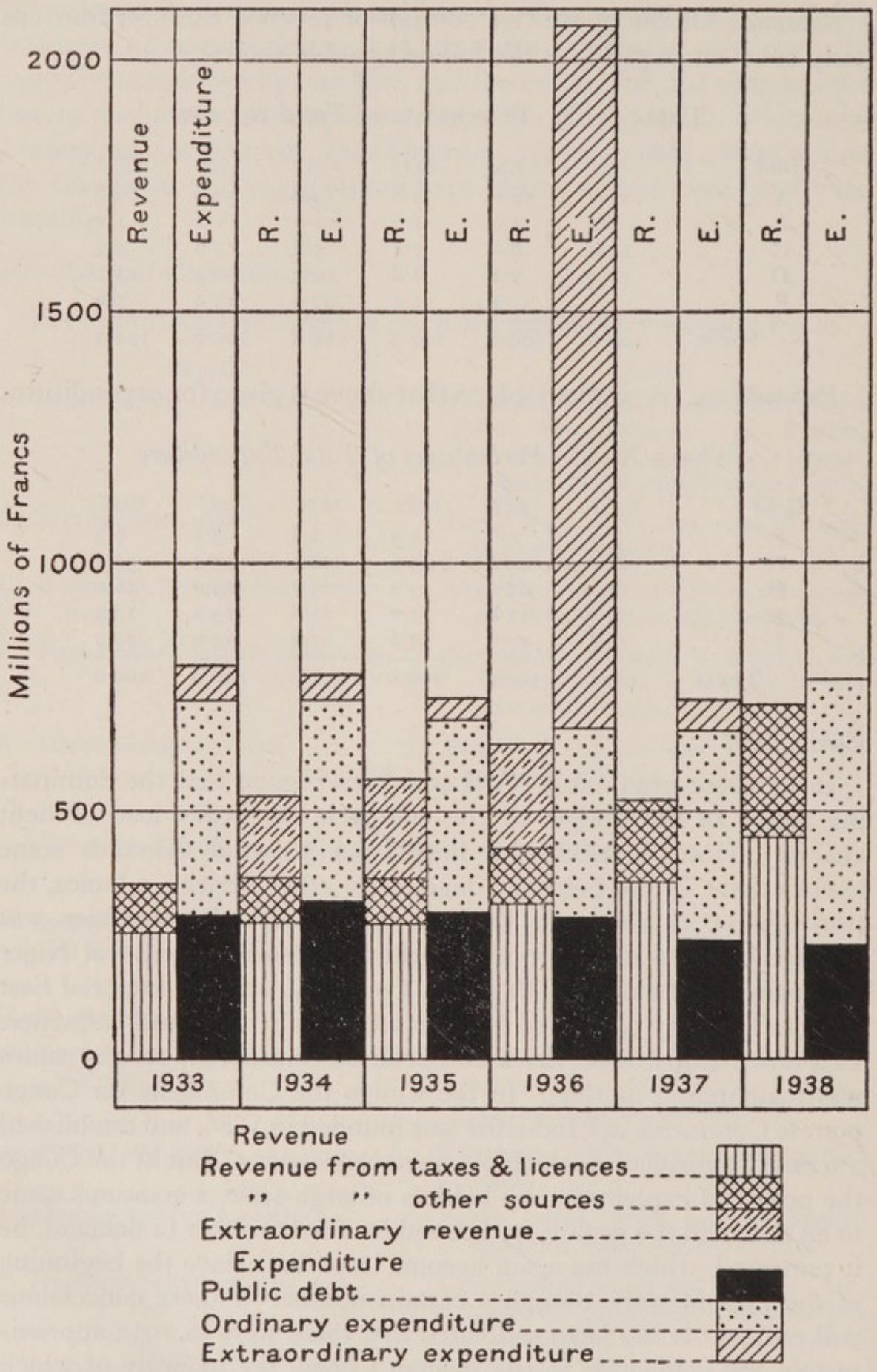


FIG. 79. *Analysis of Revenue and Expenditure, 1933–1938*

Groupe Empain, Groupe Cominière, and the Banque de Bruxelles, and the largest of these four is the first. The capital of the companies which it controls was 4,800 million francs (approximately £32,000,000) a few years ago, and the important fact is that the Belgian Government holds shares in its finances. It appears that the Société Générale alone controls 3 railways, 3 general companies, 2 banks, 12 mining companies, 6 plantations, 3 financial companies, and 1 real estate company, so that practically the whole production of copper, diamonds, radium, cement, and a considerable proportion of the gold production of the colony is in its hands.

The Government also has shares in other financial groups besides the Société Générale, and it must be remarked that a Belgian Senate Commission, in examining their operations, found the results unsatisfactory when compared with those of the Société Générale. It alleged that some of the companies tended to batten on their government guarantees and profited privately without the State sharing proportionately in any measure of success that they achieved. These facts have an important bearing on the matter of public debt, for the holdings in the Belgian Congo are an important part of the Belgian Government's investments. Some of the investments have yielded disappointing results. The character of the public debt, therefore, differs in this respect from the public debts in British colonies, or territories, for a considerable part of it represents transactions of the kind outlined above. It follows that a deficit is not always due to uncovered expenditure on the ordinary services of the administration, for it may reflect the fact that it has been necessary for the Government to implement guarantees which it has given to various concerns in which it has a financial interest; as for example in 1936 roughly £2,540,000 was paid to the Congo railway (C.F.C.), a sudden rise of expenditure which can be seen on Fig. 79, and, in 1937, about £340,000 was granted to the Otraco company for equipment. Of course, the colony receives revenue from its holdings in these and other companies. In 1934 it derived Frs. 46,000,000 (roughly £430,000) from its share holdings in companies and from interest on loans.

The public debt is divided into three categories:

1. Consolidated Debt, or long-term loans (which include a loan of £3,600,000 from Great Britain).
2. Floating Debt, or medium- and short-term bonds.
3. Indirect Debt, or guarantees on behalf of, or interest payable to, the companies or undertakings mentioned above.

The following table shows the relationship of the three debts:

TABLE XVIII. *Percentages of the Various Debts to Total Debt*

	1932	*1934*	*1935*	*1936*	*1937*
1. Consolidated Debt . .	39·2	37·2	44·2	60·8	68·5
2. Floating Debt . . .	16·6	22·4	16·0	16·3	8·3
3. Indirect Debt . . .	44·2	40·4	39·8	22·9	23·2
TOTAL	100·0	100·0	100·0	100·0	100·0

The tendency for the indirect debt to decrease and for the consolidated debt to increase will be noticed. Some of the indirect debt was transferred to the consolidated debt as a result of a Public Debt Conversion Scheme which has for one of its objectives the eventual elimination of the indirect debt. It was reported in 1938 that 5 per cent. and 6 per cent. floating debt, medium- and short-term bonds had been converted to consolidated debt status. Of the consolidated debt, 700,000,000 francs at $5\frac{1}{2}$ and 6 per cent. were converted in 1936 to 4 per cent. bonds. These are not redeemable before 1946 and will be finally redeemed in 1986.

In 1912 the total public debt amounted to Frs. 278,747,200 (roughly £11,045,000). It consisted largely of loans which had been issued by the Congo Free State before Belgium assumed responsibility. A year before the transfer the Congo Free State had contracted loans amounting to over £4,000,000. Later a special *témoignage de gratitude* of over £2,000,000 was made payable to King Leopold in fifteen yearly instalments. It may be said that an equivalent sum was spent in Belgium largely for the benefit of the new colony; nevertheless, it had to be found in the Congo.

Since 1934 the debt situation has improved. Belgium abandoned the gold standard in 1935, and the Congo naturally followed suit. The devaluation of the currency in March of that year brought about a new relation of internal to external prices, which implied a rise in the price of all raw materials sold on the world's markets. To allow the budget to share in the benefits, export duties were levied on vegetable and mineral exports, whilst import duties were reduced in order to prevent the cost of living from rising. The net result has been an increase in the yield of taxation.

Banks

The principal Belgian banking businesses are:

Banque du Congo Belge.
Banque Belge d'Afrique.

Banque Commerciale du Congo.
Crédit Foncier Africain.
Crédit Hypothécaire d'Afrique.
Union du Crédit du Katanga.
Crédit Agricole d'Afrique.

The last four are, in the main, credit and mortgage banks.

The Banco de Angola (Portuguese) has a branch at Boma, and the Standard Bank of South Africa has a branch at Elisabethville. These two banks are the only foreign concerns in the Congo. The Banque du Congo Belge was founded in 1909. It acts as the Colonial Treasury.

Money

As in Belgium, the monetary unit in the Congo is the franc which is equivalent to one-fifth of the belga, and, theoretically, the equivalent of 0·0301264 grammes of fine gold. An agreement with the Banque du Congo Belge, approved by a royal decree, authorizes the bank to issue notes in the Belgian Congo and Ruanda-Urundi as well as copper nickel coins. The notes at present in circulation are of a nominal value of 1,000, 500, 100, 20, 10, and 5 francs. Coins in circulation are of the nominal value of 5 francs, 1 franc, 50 centimes, and 20, 10, 5, 2, and 1 centimes. Notes and coins in circulation have a cover of 40 per cent. in gold and gold currencies, and they are not legal tender in Belgium. The money in circulation during 1936 and 1937 is shown in the following statement:

	Bank notes	*Metallic currency*	*Total*
1936 . .	170,336,045 frs.	136,429,814 frs.	306,765,859 frs.
1937 . .	190,294,930 ,,	166,435,519 ,,	356,730,449 ,,

The monetary parity of the Belgian franc, fixed in March 1935, also applies to the Congo. The price of gold on that date was stabilized at 33,194 francs a kilogramme instead of 23,896 francs as it had been previously; that is, there was a devaluation of 28 per cent. The belga now carries 72 per cent. (actually 0·150632 grammes) of the gold content of 1926, when the belga was first introduced. The course of the franc is represented diagrammatically in Fig. 80.

Taxation

It will have been noted already that the chief source of revenue is derived from taxation in some form or another, and, as in other African territories, customs and excise duties, which yielded from 18 to 20 per cent., of the revenue for the years 1933 to 1938, are more

important than direct taxation. Reliance on customs duties as a source of revenue naturally implies a measure of protection. The most productive of the direct taxes are the following:

Native Poll Tax. All adult males pay an annual poll tax with a supplementary tax for each additional wife after the first. The rates of the tax are fixed locally, and may be reduced or increased, or even suspended, altogether; exemptions and rebates are given to encourage

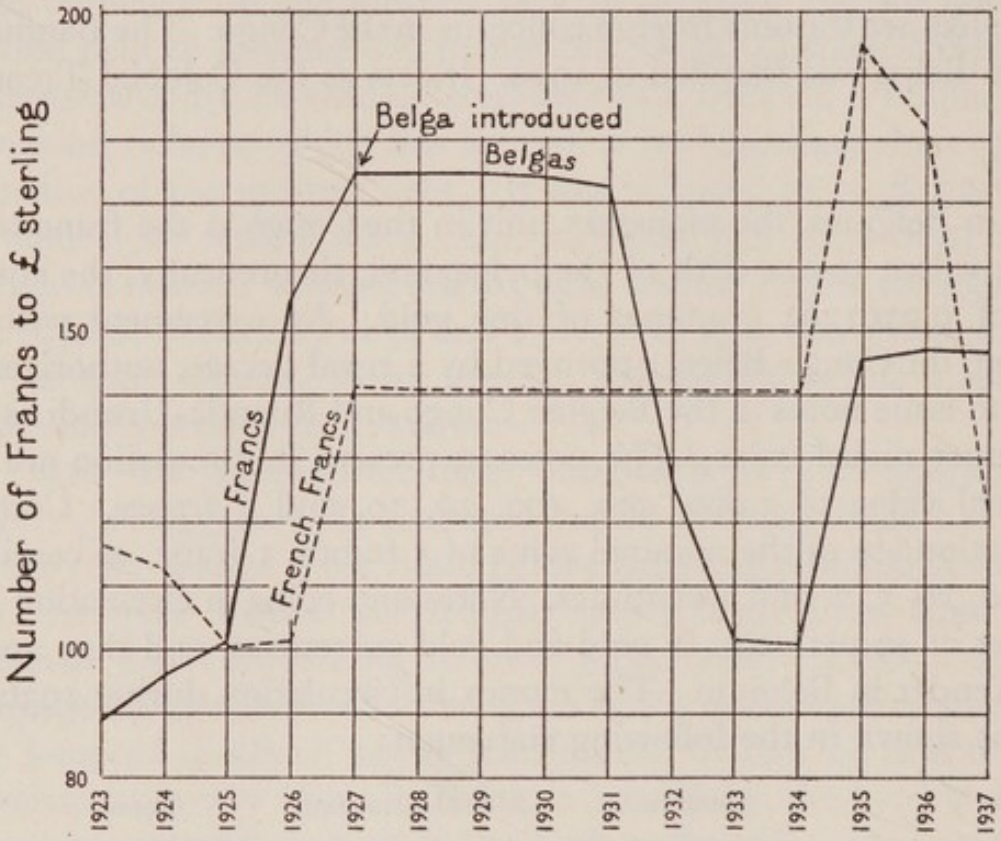


FIG. 80. *Course of Belgian Franc*

large families. Those who fail to pay the tax are employed on public works for two months; persistent tax-defaulters are imprisoned. The average tax rate (including tax for plural wives) throughout the colony was about 20*s.* a head in 1938. The tax is collected with the help of the local chiefs, or in some cases actually by them. In 1937 980 native chiefs collected over 40 per cent. of the entire poll tax. In 1936 the yield of this tax was approximately £640,000; that is about 12 to 13 per cent. of the ordinary revenue of the colony.

Income Tax. Income tax was introduced in 1920. The rate is graduated from 1 to 10 per cent. of taxable income. Europeans earning less than Frs. 9,000 per annum are exempt, as are coloured people who earn less than Frs. 3,000. There is an allowance to

Europeans of 1,500 francs for each dependant, and another of 500 francs for each member of a monogamous family. The yield of the tax was 50 million francs (about £400,000) in 1932 and nearly 90 millions (£615,000) in 1936.

Personal Tax (Impositions personnelles). This tax, with its somewhat vague title, includes: (*a*) A tax on dwelling-houses, at rates, which vary with the locality, per square metre of floor space. (*b*) A tax on land which has not been built over. This is leviable in certain towns only. (*c*) A tax on the numbers of employees or servants employed. (*d*) A tax on all ships and boats. In spite of its omnibus nature, this tax only yielded about one-fifth of the native poll tax in 1936 and one-quarter in 1938.

Licences, Permits, and Minor Taxes. Besides the above the following licences, dues, and taxes are levied or charged:

1. Native pedlar's licence and travelling permit. A native itinerant trader must be in possession of a licence and permit before he can trade.
2. Permit to carry arms. All fire-arms must be licensed.
3. Permit to sell arms and ammunition.
4. Permit to shoot game. There are several types of permits; among them are: (i) permits for residents; (ii) for non-residents; (iii) to shoot elephant.
5. Permit to recruit labourers. No person can recruit labour without a permit except for his own employment.
6. On timber; permit to work a section of forest; licence to purchase for resale or industrial use.
7. Licence to import and sell alcoholic drinks.
8. Prospecting licence.
9. Mining licence, leviable on all mines.
10. Licence to collect forest products, e.g. copal, palm nuts, wild rubber.
11. Port and light dues.
12. Pilotage dues.
13. Landing charges.
14. Dog licences.
15. Tax on cotton production. This is levied on all ginneries.
16. Tax on vehicles (including bicycles).
17. Tax on petrol.
18. Tax on ivory. All ivory is registered. There is a tax on registration.

19. Parcel tax. A charge of 50 centimes is levied on every package imported or exported.
20. Tax on subscribed or increased capital of companies.
21. Tax on registration and transfer of property.

All these taxes together yield about 30 per cent. of the total revenue.

Municipal Finance

A decree of 12 January 1923 authorized the creation of 'urban districts' to be administered by a commissioner and a nominated advisory council. Leopoldville, the capital of the colony, was created an urban district the same year, but it was not until six years later that the powers of the advisory committee were settled. The right to levy municipal taxes exists, but how far it has been exercised is not clear, for the latest available reports do not mention them. Up to 1938, Leopoldville was the only urban district.

Co-operative Societies

The Belgian law with regard to co-operative societies was applied to the Congo in 1921. Since then several societies of European employees have been approved. The most active of them, at Coquilhatville, admits the staff employees of the government, of the Banque du Congo Belge, and of religious and philanthropic bodies.

Finance in Ruanda-Urundi

Budgets

The finances of the mandated territory of Ruanda-Urundi are entirely distinct from those of Belgian Congo. As in the Congo, the mandated territory has annual Ordinary and Extraordinary Budgets, which follow the same classification of revenue and expenditure.

The more recent budgets are shown in Table XIX.

Ordinary Budgets

Revenue. Of the ordinary revenue, 70–80 per cent. comes from direct or indirect taxation, the remainder from land rents, sales of ivory, post office receipts, court fees, and charges for public services of all kinds.

The native poll tax is the most productive of all taxes and contributes 30–40 per cent. of the total. Customs duties contribute

25 per cent., but income tax yields only 3 per cent. These forms of taxation produce more than three-quarters of the total revenue collected under the head 'Licences and Taxes' and leave but a small burden for the numerous other charges to carry. The same licences are issued and the same taxes charged as in Belgian Congo.

TABLE XIX. *Budgets of Ruanda-Urundi*

Year	*Ordinary Budget*		*Extraordinary Budget*	
	Revenue	*Expenditure*	*Revenue*	*Expenditure*
1933	Frs. 40,745,403	Frs. 34,403,424	Frs. 208,587	Frs. 22,200,000
	£ 342,500	£ 286,100	£ 1,753	£ 186,600
1934	Frs. 42,904,976	Frs. 37,636,706	Frs. 114,381	Frs. 7,473,800
	£ 397,300	£ 348,400	£ 1,058	£ 69,200
1935	Frs. 40,095,289	Frs. 33,092,450	Frs. 170,706	Frs. 8,800,480
	£ 275,600	£ 227,400	£ 1,173	£ 60,470
1936	Frs. 42,309,185	Frs. 31,279,468	Frs. 473,695	Frs. 2,961,000
	£ 287,900	£ 212,900	£ 3,240	£ 201,400
1937	Frs. 46,699,047	Frs. 33,880,587	Frs. 225,585	Frs. 1,017,000
	£ 318,000	£ 231,200	£ 1,539	£ 6,939
1938	Frs. 49,766,587	Frs. 39,736,462	Frs. 136,225	Frs. 2,700,000
	£ 340,200	£ 270,500	£ 9,307	£ 184,300

Subsidies and Grants. In the past the revenue collected in Ruanda-Urundi has not been sufficient to balance the budgets. To bridge the gap between expenditure and revenue subsidies have been granted by the Belgian Government, and interest-free, but reimbursable, loans have been advanced by the Home Government and by that of the Belgian Congo. In 1933 a subsidy was granted by Belgium amounting to Frs. 12,000,000 (roughly £93,000) and subsidies were continued in a decreasing scale until 1937, when Frs. 2,000,000 (£13,700) were granted. Loans have also been on a decreasing scale: from Frs. 7,740,425 (£60,000) in 1933 to Frs. 2,418,500 (£16,700) in 1938.

Expenditure. A few years ago the League of Nations requested the Mandatory Powers in Africa to submit, with their annual reports, an analysis showing the proportion of their revenues which had been expended solely for the benefit of the natives. Such an analysis is exceedingly difficult to prepare unless a most elaborate costing system has been introduced. However, it was estimated that in 1938 nearly one-third (actually 29%) of the total ordinary expenditure of Ruanda-Urundi was disbursed in the direct interests of the natives.

The average expenditure on all charges over a period of six years (1933–1938) shows the following results:

	Percentage of total ordinary expenditure
Administrative staff	19%
Debt charges	18%
Health services	16%
Agriculture	10%
Public works	7%
Defence	6%
Education	5%
Secretariat	4%
Customs and treasury	4%
Transport	2%
Post and telegraph	1%
All other charges	8%
	100%

Extraordinary Budgets

Table XIX shows that the authorized expenditure under the extraordinary budgets greatly exceeds the revenue. The debt thus created is responsible for a charge of 18 per cent. of the ordinary expenditure. The revenue is obtained from various sources, including *Recettes extraordinaires diverses*, and the same rules apply to these receipts as in Belgian Congo. Expenditure is incurred chiefly on public works. In 1937–1938, £18,000 was spent on the development of the port of Usumbura on Lake Tanganyika. Other sums of money have been spent on buildings and hospitals, the construction of roads, and on anti-sleeping sickness and other public health measures.

Finances in Central Africa: A Comparison

The following table shows how the finances of the Belgian territories contrast with those of other, and neighbouring, central African colonies.

Table XX. *A Financial Comparison*

Country	*Area in square miles*	*Population*	*Average density per sq. mile*	*Per head of population*	
				Revenue	*Expenditure*
				£	£
Belgian Congo	902,000	10,354,000	11·3	0·48	0·51
Ruanda-Urundi	20,540	3,783,960	184·0	0·09	0·01
Angola	481,230	3,484,300	7·2	0·67	0·67
Northern Rhodesia	290,320	1,376,330	4·7	1·16	1·03
Tanganyika Territory	360,000	5,260,480	14·6	0·40	0·42
Kenya	224,960	3,365,900	14·9	1·12	1·15
Uganda	93,980	3,745,160	39·8	0·50	0·54
Anglo-Egyptian Sudan	969,600	6,342,480	6·5	0·43	0·40



89. *Caravan road, Matadi–Leopoldville*



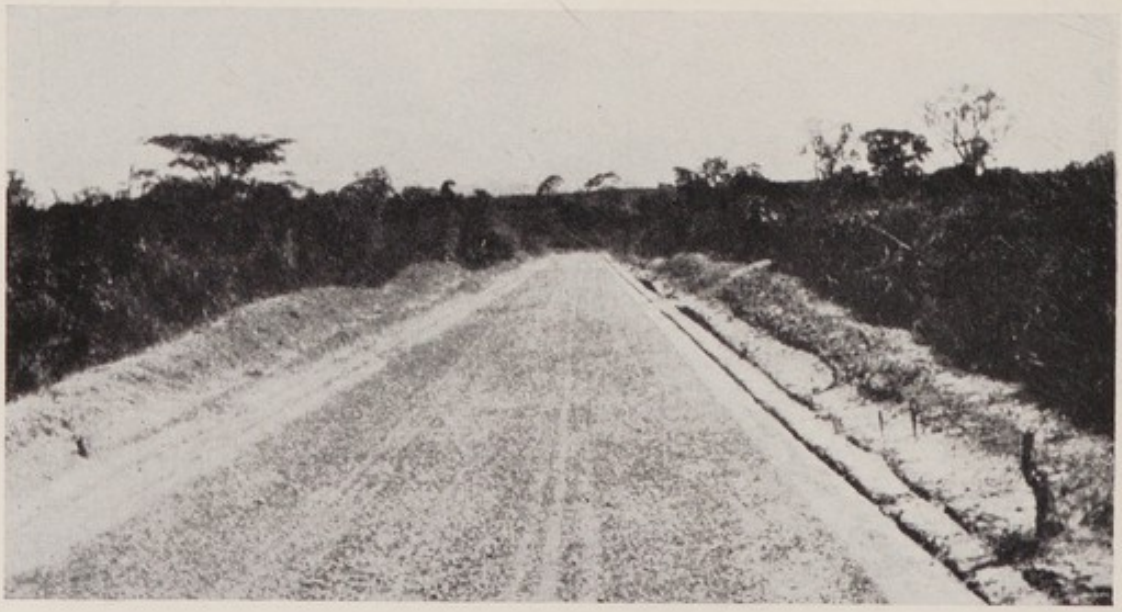
90. *Motor road, Matadi–Thysville*



91. *'Route Royale' in Ituri Forest*



92. *Section of road treated with laterite, Haut Uele*



93. *Typical earth road, Sankuru*

CHAPTER XV

COMMUNICATIONS

(*A special Communications Map will be found in the end pocket*)

In ancient times the only means of communication in what is now the Belgian Congo were the rivers, lakes, and foot-paths. The first inland navigators made themselves rafts, and recently rafts made of bundles of reed or papyrus were used by a backward tribe on the lower Lomami. The next step was to shape a log into a dugout canoe. Such dugouts are still the ordinary native craft, and some of them hold sixty people. Certain tribes have learned to use boards or planks and so have become boat-builders of a sort.

In the eighteenth century the slave trade created well-beaten trails from central Africa to the east and the west coasts. The most important routes followed the watersheds north and south of the Congo basin, and villages were linked to them and to each other by tracks which, later on, enabled explorers to cross Africa—Livingstone from Quelimane to Loanda and Cameron from Zanzibar to Benguela.

Modern communications were introduced by Stanley when he made a wagon road past the rapids of the lower Congo to convey small steamers to Stanley Pool, and, with them, began river traffic reaching as far as Stanleyville. His original road followed the north bank, but he afterwards made another from Matadi to Stanley Pool on the south side of the river. All the road transport was by carriers. The southern caravan route at first employed about 1,500 carriers a month; this number was increased until, by 1887, 60,000 loads a year were transported over the route. Taking an average load as 45 lb., about 1,340 tons a year were carried by head porterage, and it absorbed 1,000 man-days to transport 1 ton.

During the nineteenth century, and before the Congo Free State was born, trading factories had been built at Banana and Boma, and European vessels had begun to call at intervals. The foundation of the Congo Free State gave a fillip to this trade, and it is interesting to note that in the year of that foundation the *Dunrobin Castle* inaugurated a direct service by the Castle line between Antwerp and the Congo.

A railway from Matadi to Leopoldville was essential, and this was begun in 1890 and completed by 1898. At the latter date there were

forty-five steamers plying on the middle Congo, all of which had been transported overland.

Before further railroad construction east of Stanley Pool, a railway was started in 1898 to develop the hinterland of Boma, but it did not reach its present terminus, Tshela, 25 miles from the Cabinda frontier, till 1913. The main programme of railway construction was resumed in 1903 and by 1906 a line from Stanleyville had reached Ponthierville. This was immediately followed by the construction of a line from Kindu to Kongolo. These railways by-passed the Stanley Falls and other rapids and, by conveying vessels in parts, opened fresh sections of river to steam navigation. By 1911 large steamers had reached Bukama. The colony had thus a rail and river route from Katanga to Matadi, but it was not yet connected by rail with Elisabethville, and five transhipments were necessary.

A telegraph line from Boma was brought across the Congo from cliff to cliff at the Devil's Cauldron. It shot ahead of the railway and reached Coquilhatville in 1899. The telegraph system has since been greatly developed and telephone facilities have been added. The first native telegraphists were trained by Mrs. Bentley, the wife of a Baptist missionary, who learned Morse during her leave in England.

The scientific discoveries of the twentieth century accelerated the progress of the Belgian Congo. In 1900 the Marconi Company had set up an office at Brussels. Colonel (afterwards General) Thys, who was then aide-de-camp to the king, was one of the company's first directors and, at his instance, a wireless station, in touch with Ambrizete in Angola, was established at Banana in 1902. Although the service was poor owing to atmospherics, the system developed until Boma was linked up with Elisabethville in 1912, and by 1913 there was radio communication with Belgium. The system has since been greatly extended.

By 1906 the Rhodesian railway had reached Broken Hill, 140 miles from the Belgian frontier, and was extended to Sakania on the frontier in 1909. A Belgian line from Sakania to Bukama was then begun and reached Elisabethville in 1910, but war delayed its completion till 1918. The effect of linking Katanga with South Africa and Beira was to develop a large traffic southwards and south-east. Meanwhile the Belgians had constructed a line from Kabalo to the west shore of Lake Tanganyika and the Germans had completed a railway to the east shore, so that there was transport from the upper Congo (or Lualaba) to Dar-es-Salaam. When the rail, river, and lake route between Katanga and Dar-es-Salaam was complete it

captured some of the Belgian traffic, especially the export of copper, but this route involved four transhipments and has suffered from the competition of newer and easier ways of exit.

The development of roads was due to the introduction of mechanical transport. Steam lorries were tried in 1903 in the Lado enclave, and in 1906 a service in Uele district was inaugurated from Buta, but the greatest advance was the introduction of motor vehicles about 1911. The Government was the first to own motor transport, but gave it over in 1930 to Vicicongo, which now runs services from Bumba and Stanleyville into French Equatorial Africa and the Sudan, and to Lakes Albert and Kivu. The Nile is an obvious, if long and slow, outlet for goods from the north-east, and a railway to it was projected, but good roads and motor transport soon met all requirements, and the railway was not built. The vehicles employed in these services range from touring-cars to 'road-trains' consisting of a tractor and two trailers. Since the development of motor transport much petrol has been sent into the Belgian Congo over the Kenya–Uganda railway and then by lorry over the roads from Uganda.

There was some flying in the Belgian Congo during the War of 1914–1918, but aviation may be said to have started in earnest during 1920, when the first section of the route between Leopoldville and Coquilhatville was opened. By 1927 the Sabena air route between Leopoldville and Elisabethville was complete, and by 1934 there was a service between Brussels and Leopoldville. In 1941 Pan-American Airways started a service between Miami and Leopoldville via West Africa.

The War of 1914–1918 delayed railway construction, but, during it, the Matadi railway was extended to Ango Ango, and a cable was laid by the Eastern Telegraph Company to connect Banana with the British cable between San Thomé and Loanda. The colony took over the cable station in 1928. It was during the 1914–1918 war that the Matadi railway began to prove inadequate, causing congestion in the port. It was, therefore, rebuilt between 1923 and 1932. At the same time railway construction was resumed. Between 1923 and 1928 a line was constructed from Bukama to Port Francqui on the Kasai, providing a new route between Katanga and the lower Congo. This reduced transhipments to two as compared with the four on the route via Dar-es-Salaam, and captured trade for the Congo port at Matadi. In 1928–1931 a line was made from Tenke, between Elisabethville and Bukama, to connect with the Benguela

railway running to Lobito bay, thus providing a new outlet. The obvious advantage of this route is that no transhipment is necessary. As a result, Katanga copper has been almost wholly diverted from the east coast route. The Belgian Congo Government aims at rivalling this route by connecting Port Francqui by rail to Leopoldville so as to provide a through Belgian railway from Katanga to the lower Congo. During 1924–1937 a railway was constructed from Aketi to Mungbere with a branch to Bondo on the Uele, and in 1939 Kongolo was linked by rail to Kabalo. A railway was also begun in 1933 to connect Lake Tanganyika with Lake Kivu, but so far it has only reached Kamaniola. A motorable road has been nearly completed between Leopoldville and Matadi.

From this outline it will be apparent that traffic to and from the Belgian Congo now follows seven main routes. On the west, it goes via Matadi or via Lobito bay; on the south-east, by the South African railways to South Africa and Beira; on the east, via Dar-es-Salaam; and on the north-east by road and rail to Mombasa or by the Nile to the Mediterranean. It would be interesting to compare the volume of trade which passes by each of these routes, but the figures available are not conclusive. In 1937, the latest year for which comparative statistics are available, we find that 384,370 tons of goods passed over the section of railway between Tenke and Dilolo, mainly, but not wholly, on their way to or from the Benguela railway and Lobito bay, while 2,668,000 tons were carried over the section between Bukama and Sakania, the bulk of which probably came from or went to South Africa and Beira. During the same year 532,000 tons of goods were handled at Matadi and 7,900 tons came into, or went out from, Ruanda-Urundi via Dar-es-Salaam. No figures are available for traffic via the Nile, but, while by no means negligible, it was certainly less than the traffic by any of the other routes. The road and rail route to Mombasa is probably more important than the Nile route. With world changes, no doubt the proportions will fluctuate, but one thing is certain—that the Belgian Government will strive to attract more traffic to the national routes.

WATERWAYS

THE waterways of the Belgian Congo consist of the Congo river system and the eastern lakes. Continuous river navigation is confined to the lowest level of the Congo basin, but there are some navigable

stretches on higher levels. The communications map at the end of this volume shows the navigable portions of the rivers.

Rivers

Most of the rivers have been described in Chapter II and the communications of the inland ports in Chapter XI. Ocean-going vessels ascend the Congo as far as Matadi. From Leopoldville river craft can sail as far as Stanleyville on the Congo (1,075 miles), normally 11 days' voyage upstream and 7 days down; to Aketi on the Itimbiri (1,000 miles), 12 days up and 8 down, and up the Kasai to Port Francqui (526 miles), 9 days up and 5 down, and even as far as the Wissmann falls. Barges require longer. The Kasai is more difficult to navigate than the Congo. Vessels whose draught does not exceed 4 feet can also ascend the Ubangi, in the rainy season, to the French town of Bangui, but larger vessels cannot pass the rapids at Zinga, 50 miles below Bangui. Navigable portions of the Lualaba are also important links in the chain of communications. Vessels take normally 2½ days upstream or 1½ days downstream between Ponthierville and Kindu (198 miles), and 5 days upstream or 3½ days downstream between Kongolo and Bukama (387 miles).

Many other rivers can be navigated by smaller vessels. The Giri can be ascended from its confluence with the Ubangi to Bomana, 125 miles upstream. The Itimbiri or Rubi is navigable from 20 miles N.E. of Aketi to Buta. During high-water, vessels of not more than 3 feet draught can ascend the Aruwimi from Basoko to Yambuya, but above that point launches or canoes are necessary to reach Avakubi. Light-draught steamers from the Lualaba can ascend the Luvua from Ankoro to Kiambi (90 miles). They can also navigate the Lomami, from the Congo, for 280 miles to Bena Kamba. The Lulonga, between the Congo and Basankusu (125 miles), is navigable by small craft all the year round. Above Basankusu the Lulonga divides into the Lopori and the Maringa. In the season of high water small steamers sail up the Lopori as far as Lokolenge and sometimes even to Bosow (284 miles), and up the Maringa as far as Befori (300 miles). The Sankuru is navigable by small steamers up to Lusambo during most of the year and by smaller craft as far as the Wolf falls above Pania Mutombo. The Kwilu takes large steamers to Leverville nearly all the year round, and the Kwango can be navigated from its confluence with the Kasai to Kingushi

(160 miles). From above the falls at Kingushi small steamers can ascend to the Francis Joseph falls, another 170 miles.

Lakes

Details of the services on Lake Tanganyika are given in Chapter XI. On Lake Albert the Kilo-Moto mines maintain a steamer of 400 tons and a number of barges at Kasenyi. From Kasenyi to Butiaba in Uganda, where there are British vessels, is 65 miles or 5–6 hours' sail. A river steamer runs from Kasenga on the Luapula to Pweto at the northern end of Lake Mweru. On Lake Kivu a regular motor-barge service runs between Costermansville and Goma.

Shipping

There has been a great increase in the size of vessels used on the Congo since European river shipping started in 1881. The pioneer was Stanley's *En Avant*, a small paddle-steamer, 43 feet long, of 6 h.p., and with a capacity of 7 tons. Another notable craft was the twin-screw mission steamer *Peace*, 69 feet long and 14 tons, in which so much of Grenfell's exploration work was done. Their modern successors are the stern-wheeler *Capitaine Hanssens*, 1,690 tons gross and 600 h.p., and the side-paddle steamer *Kalina*, 213 feet long, 1,100 tons gross, and 900 h.p. Barges have also increased in length to 250 feet and in tonnage to 1,756 tons gross.

River navigation can only be carried on by means of shallow-draught steamers. According to the H.C.B. the draught of steamers should not exceed 1·8 metres, or just under 6 feet. In high-water periods the draught may reach 2 metres (6·6 ft.). Until comparatively recently it was customary to lash barges alongside the towing steamer; now a system has been developed whereby a train of barges is towed astern of a stern-wheeler tug, in spite of the obvious danger of the tow fouling the wheel. The stern-wheeler is preferred to the side-wheeler as the latter is not convenient to manœuvre alongside a bank in shallow water. Side-paddles are more liable to damage than a stern-wheel when aground on a bank, for the stern-wheel receives more protection from the hull. Practically all steamers and barges sail by day; shoals, rocks, snags, banks, and narrow channels make it difficult to find the way by night in spite of navigation marks erected by the Government.

A type of stern-wheeler has been developed on the Congo which is eminently suited to the conditions encountered on the river, but in general principles all stern-wheelers, whether for Congo or Nile, are alike. As the name implies, the paddle-wheels and their driving machinery are situated right aft. In order to counterbalance the weight of the engines and the overhanging wheel the boilers are as far forward as possible. Generally they are placed in the bows, although there are steamers with boilers just forward of amidships. The hulls of stern-wheelers are mere pontoons shaped to a bow (which is sometimes a spoon bow) and provided with a suitable counter. The hulls are often divided by bulk-heads both on the fore and aft line and athwart-ship. Sometimes the cross-section of the hull amidships is rectangular without any rounding of the bilges. It is obvious that the hulls carrying the weight of the boilers at one end and of the engines at the other will tend to hog if adequate precautions are not taken. Hogging is very noticeable in some stern-wheelers. Usually the hull is strengthened by some sort of a truss or frame, in order to resist the upward thrust amidships, and in such a manner that the hull forms the bottom member of the truss. The strengthening is usually carried out very simply by means of king-posts and tension-rods on either side of the vessel. The arrangement of posts and rods also carries the upper deck or decks, on which are built the deck houses for passenger accommodation. The paddle-wheels in the smaller boats are almost always fitted with radial floats which cause a good deal of vibration; in larger boats feathering floats (or Morgan wheels) are fitted. When being loaded a stern-wheeler is trimmed by the head so that her wheel-floats are not submerged. Powerful stern-wheel tugs have been built which measure 172 feet overall, by 40 feet beam, with 7 feet draught and developing 550 h.p.

Screw-propeller boats on the rivers are usually of a small type. Some of the boats have propellers working in tunnels; others are merely sea-going launches. The H.C.B. possessed a large steamer which had a single screw working in a tunnel provided with a 'Yarrow flap'. The principle of this system of propulsion is that the flap closes the end of the tunnel until such time as the propeller in motion fills the tunnel with solid water. The flap is then raised and the water in the tunnel has a free way of escape. It is claimed that the propeller continues to revolve in solid water after the flap has been raised and that the flow of water from the tunnel in no way retards the vessel. There was also a boat with triple screws working in three separate

tunnels, but in spite of these expedients screw-propeller boats have been ousted by the stern-wheeler. Stern-wheeler tugs show the popularity of this system of propulsion.

Other reasons for the unpopularity of the screw steamer are that there is a very large amount of sand in suspension in the Congo waterways and the consequent wear of shaft and stern tubes by sand makes it difficult to keep the latter in efficient order. Propellers are liable to be stripped by striking submerged tree-trunks which cannot be seen in the muddy water. Screw engines are fast running; a stern-wheeler's engine can plod along at 60 revs. per min. Finally, the whole of the propelling gear in a stern-wheeler is above water—a very important point where long stretches of river have to be navigated in which there are no facilities for docking.

Lake Tanganyika is the second deepest lake in the world and is subject to sudden fierce storms, whilst waterspouts may also be a danger to shipping. Passenger-carrying steamers on the lakes are, therefore, usually small editions of ocean-going vessels. The engines are amidships. Cabins are arranged on the promenade deck, while the lower deck is reserved for native passengers. Tugs are twin-screw and sometimes have passenger accommodation.

RAILWAYS

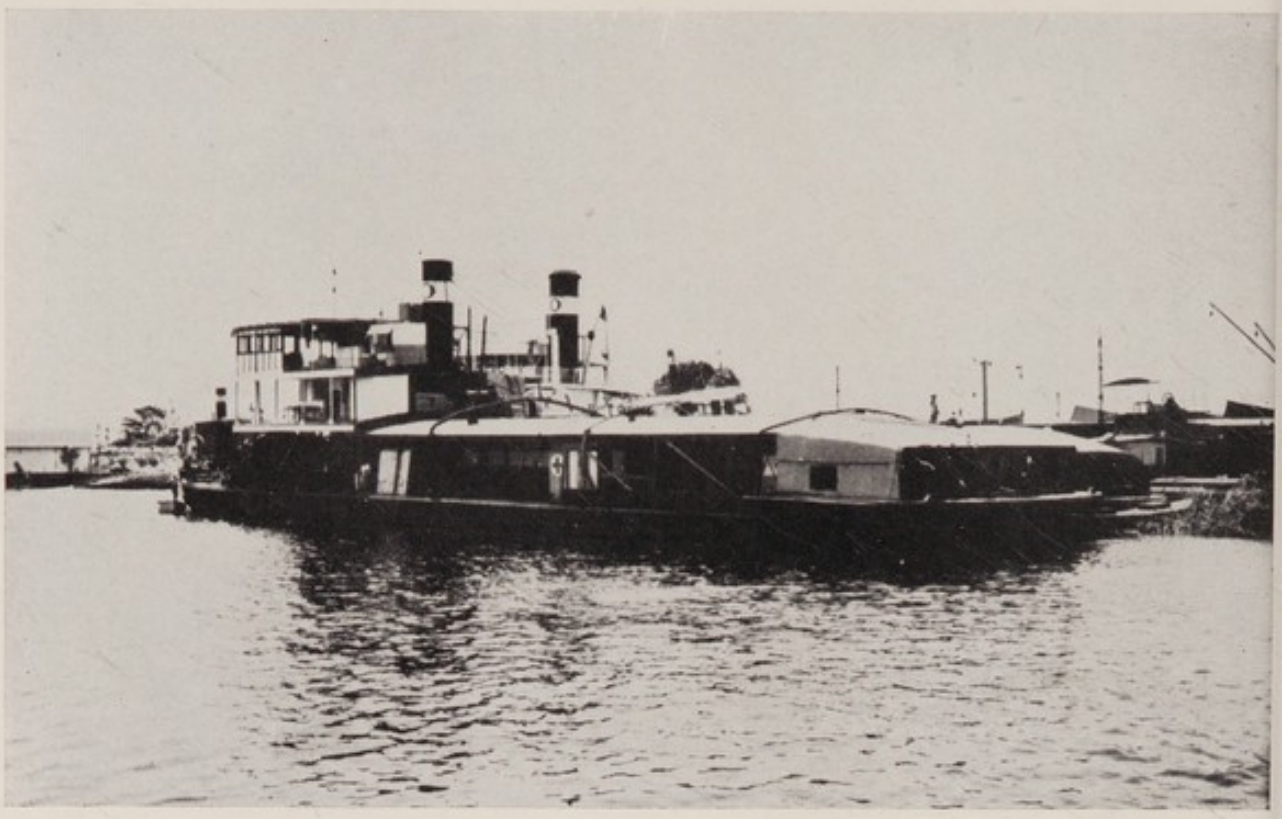
THE railways may be divided into two classes. Some form part of the transcontinental system, while others are local. The original idea was to amplify river transport systems by using short railways wherever rapids blocked the rivers. The development of the copper mines of Katanga forced a connexion with the South African railways and introduced the standard South African gauge of 3 ft. 6 in. This is the gauge of the line from the Northern Rhodesian frontier to Port Francqui on the Kasai, and it is now the gauge of the railway from Leopoldville to Matadi, with an eye to the construction of a line to fill the gap between Port Francqui and Leopoldville and so complete the transcontinental route. The same gauge has been adopted on the Lobito bay railway and the Belgian line which connects with it, thus providing another transcontinental route. This gauge has also been adopted on the partly constructed line between Lakes Tanganyika and Kivu. The remaining railways consist of detached portions of line with no through rail connexions.



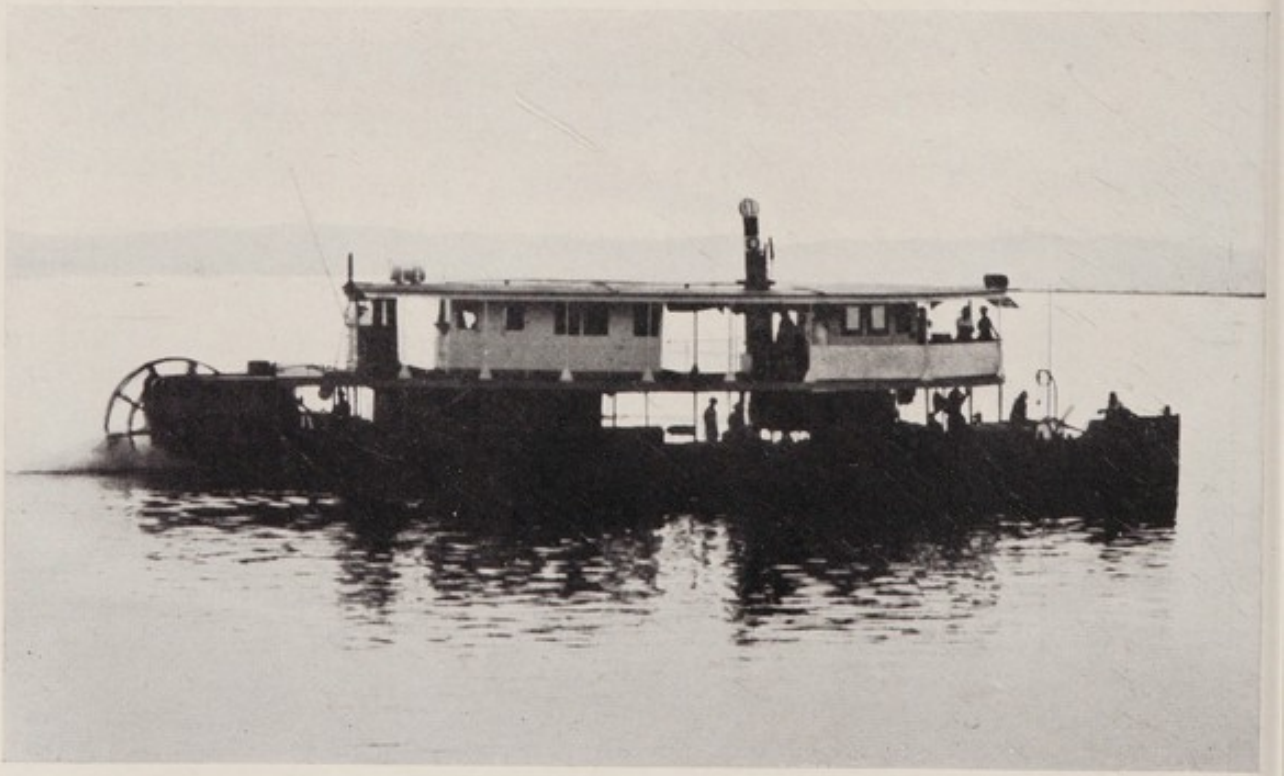
94. *Car-ferry*



95. *Buta sign-board*



96. *Sternwheel tugs, 550 h.p. The nearest vessel is the 'Louis Goffin'*



97. *Sternwheel steamer of type known as 'Deliverance', 60 h.p.*

1. Chemin de Fer du Congo (C.F.C.) (Fig. 81)

MATADI–LEOPOLDVILLE

The C.F.C. connects the network of navigable rivers which spread over the interior of Belgian Congo with the ocean port of Matadi. Naturally it was the first railway to be constructed.

In July 1889 the Compagnie du Chemin de Fer du Congo was formed with a capital of 25 million francs (approximately £1,000,000). It was granted a concession from the then Government to build a

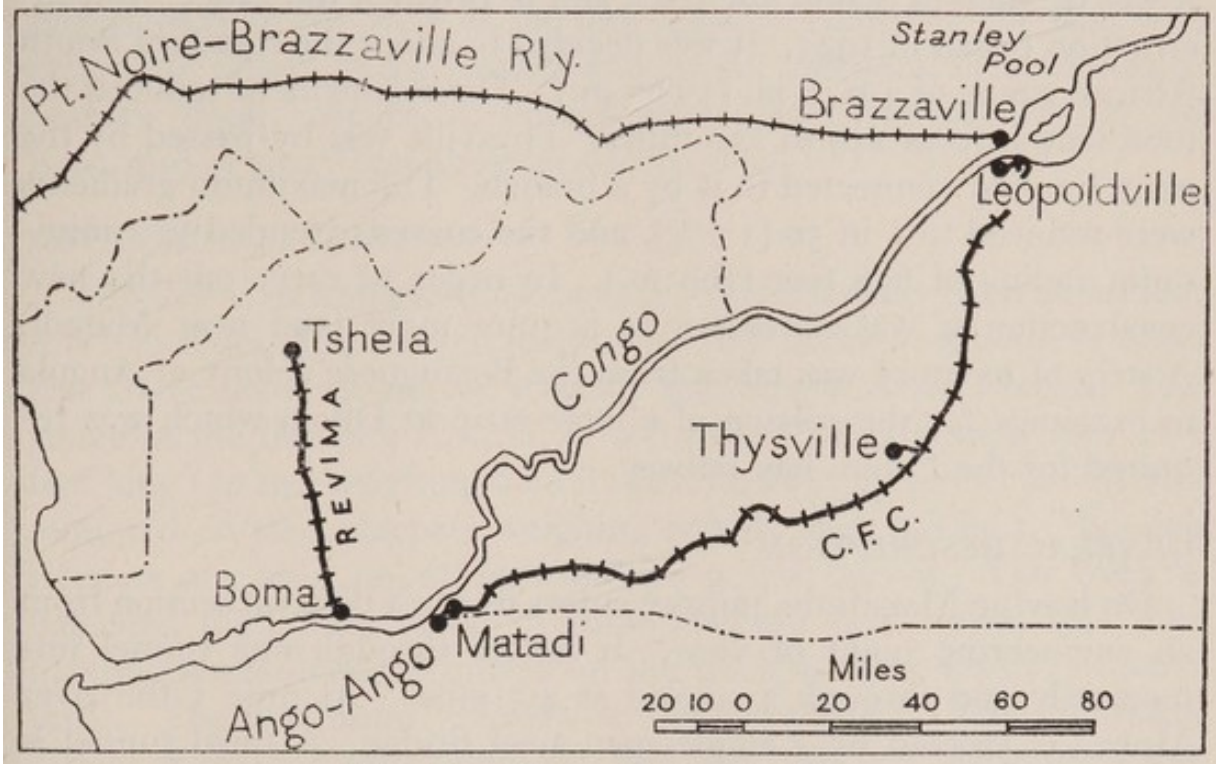


Fig. 81. *Chemin de Fer du Congo*

narrow-gauge railway from Matadi to Leopoldville. Work began at Matadi on 1 July 1890, but the construction of the line proved to be much more difficult than its promoters had imagined. After a year and a half's labour less than 2 miles of the track were finished at a cost of a quarter of the company's capital. During the first two years 900 of those employed on construction died, including 42 Europeans, and it was necessary to repatriate nearly 300 Europeans. However, in spite of all, the first train got through to Stanley Pool on 16 March 1898. The railway had cost 60 million francs (approximately £2,400,000) and eight years of anxious work. It was nicknamed the 'Joujou tramway' by those in Belgium who failed to realize its extreme importance to the country.

The gauge of this first railway was 2 ft. 6 in.; gradients were as steep as 1 in 22 (4·5%) and there were curves of less than 200 feet

radius (actually 60 metres). The rolling-stock was of the lightest type and was fitted with handbrakes only. The journey from Matadi to Leopoldville took 20 hours, and the train halted for the night at Thysville.

This somewhat makeshift line, which was extended from Matadi to Ango Ango, proved inadequate for the needs of the country, and it may be noted that it had also to serve French Equatorial Africa before the construction of the Brazzaville–Pointe Noire railway. There was congestion both at Matadi and Leopoldville, and it was decided to realine the track and to broaden the gauge. Reconstruction began in 1923. It was decided to adopt the standard South African gauge of 3 ft. 6 in. (1·067 m.). The realinement reduced the total length from 249 to 232 miles. Thysville was by-passed by the main line but connected to it by a branch. The maximum gradients were reduced to 1 in 59 (1·7%), and the curves extended to a minimum radius of 656 feet (200 m.). In order to carry out the new construction it was necessary to acquire more land near Matadi. A strip of territory was taken from the Portuguese colony of Angola in exchange for the cession of a large strip at Dilolo which was required for the Lobito bay railway.

GENERAL DESCRIPTION

On leaving Matadi the railway enters its most difficult section from an engineering point of view. It passes through one tunnel immediately and through a second at 4·5 miles. At mile 5 the river Mpozo is crossed by a single-span steel bridge. A third tunnel is passed at mile 11. At 9 miles from Matadi the railway reaches an altitude of 918 feet, having risen 711 feet in 4 miles. Beyond this point it switchbacks for some distance, and then gradually rises to cross the watershed of the Mavutete and Lufu rivers. At the crest of the watershed the line is 1,295 feet above sea-level. After 46 miles the country is less broken for a distance of approximately 36 miles. In this section, however, the railway crosses the Lufu, Kunkula, Sansikua, Kwilu, and Gongo rivers, the valleys of which introduce gradients and important bridges. On the original railway the crest of the watershed between the Lufu and the Sansikua was 1,573 feet above sea-level, and the Lufu crossing was at 961 feet: the levels of the present track are probably not much different.

Beyond Gongo the railway begins its ascent of the high Bangu plateau on which stands Thysville. About 6 miles beyond Kimpese, at Lukala, the old track ran on directly through Thysville, but the

new by-passes it to the south-east and sends out a branch to it, rejoining the old track not far from Kisantu. From mile 139 to mile 144·5 the original railway rose from 1,903 feet to 2,448 feet above sea-level. This last was the highest level on the system and has been reduced by the new alinement to 2,220 feet. Nevertheless, this section is still one of continuous grades and curves through mountainous country. The next important rivers, the Inkisi and Lukusu, are crossed at about 1,740 and 1,760 feet respectively above sea-level. Beyond the Lukusu, realinement has taken the new railway to the west of the old, leaving Tampa to the east, and enters the valleys of the Lukaya and Njolu, following them almost to Stanley Pool, whence it swings west into Leopoldville (or old Kintamo) at 1,017 feet above sea-level.

DETAILED DESCRIPTION

The C.F.C. is a single-track railway. It has already been noted that it is 232 miles (374 km.) in length and that its highest point is 2,220 feet above sea-level and very nearly that height above Matadi. The gauge of the line is 3 ft. 6 in. (1·067 m.). Flat-bottomed rails 32·8 feet long (10 m.) weighing 66·8 lb. per yard (33·4 kg./m.) are usually mounted on steel sleepers weighing 106 lb. each (48 kg.). Wooden sleepers are used on bridges and on a few curves. The track is ballasted with local stone in some sections but not in all. The maximum axle-load permitted on the track is 15·75 tons (17 metric tons). The maximum gradient is 1 in 59 (1·7%). The minimum radius of the curves is nominally 820 feet (250 m.); there are a few curves as sharp as 656 feet (200 m.) but they are exceptional. The following table analyses the 125 bridges and viaducts of the line.

Number	*Feet (approx.)*	*Metres*	*Number*	*Feet (approx.)*	*Metres*
12	13	4	3	82	25
9	16	5	5	98	30
13	20	6	1	131	40
9	26	8	2	164	50
10	30	9	2	197	60 Mpozo river
22	33	10			(1 single span; 1 in 3 spans)
6	39	12	1	230	70 (in 3 spans)
5	49	15	1	262	80 Kwilu river
8	65	20	1	328	100 Inkisi river
			15	Unclassified	..
94			31		
			Total 125		

Three tunnels with a total length of 1,542 feet (470 m.) have been driven to overcome the difficulties of grade in and about the deep Mpozo valley. The first tunnel (885 ft. long) is not much more than a quarter of a mile from Matadi; the other two are between 4½ and 11 miles from that place.

Altogether 125 bridges and viaducts of varying spans and construction have been erected. Steel lattice girder bridges are preferred for the large spans.

Rolling-stock and its Maintenance

In 1940 it was reported that there were 62 locomotives of the following types in use. Garrett locomotives are also mentioned in one report which has not been confirmed.

Locomotives

Number	*Type*	*Wheel arrangement*	*Weight in running order (tons)*	*Tractive force (lb.)*
5 Main line	Mikado	2–8–2	65	23,060
17 ,, ,,	,,	2–8–2	78	28,820
6 ,, ,,	Decapod	2–10–2	81	33,660
2 Shunting	Tank	0–4–0	14	..
3 ,,	,,	0–4–0	18	..
29 ,,	..	0–6–0	27	10,945
Total 62				

In 1906 the locomotives of the C.F.C. burned compressed coal briquettes which were imported from Belgium; later they were converted to burn oil fuel. A 4-inch pipe, capable of delivering 33,000 gallons of fuel oil per diem, was laid alongside the railway from Ango Ango to Leopoldville. Fuelling stations for locomotives have been erected at various points along the line. The locomotives shown in the above list were designed to burn either coal or fuel oil.

Locomotive watering stations are arranged at intervals of 9–12 miles along the track. The main stations are at Matadi, Songololo, Tumba, and Boko, where there are steam pumping plants. The intermediate stations are supplied by hand pumps.

Repair shops for locomotives and rolling-stock are at Matadi, Thysville, Songololo, and Leopoldville. The chief shops are at Thysville.

The most critical factor on this, and indeed on all railways in the Belgian Congo, is the small number of locomotives, by far the

greater number of which were built in Belgium. Since 1940 it has been impossible to get spares, so that all defective parts must be repaired or remade locally. With the machinery available only a limited amount of repair work can be undertaken and the efficiency of the available locomotives is much reduced thereby.

Coaches and Wagons. In 1938 there were 43 passenger coaches and 35 brake vans. They are fitted with automatic couplings and vacuum brakes.

In 1940, 1,644 wagons were in use (1,561 owned by the C.F.C. and 83 privately owned). Details are given below. Many are bogie wagons, all are fitted with hand brakes, and some are piped for vacuum brakes.

Wagons

No.	*Type*	*Capacity (tons)*
	Steel Bodies	
6	Tank	16·5
7	Breakdown van (closed)	15·75
37	Covered goods	14·5–19·5
10	Explosive-carrying	14·5
1	Crocodile	39
20	Cattle	14·5
1	Fruit-carrying	19·5
90	Flat	14·5–19·5
152	Open, low sides	14·5–29·5
216	Open, side doors	14·5–24·5
	Wooden Bodies	
414	Covered goods	14·5–19·5
	Composite, Wood and Steel	
330	Covered goods	14·5–29·5
248	Open	..
18	Ballast trucks	14·5
11	Various	..
1,561	Total	

Besides the above there were the following privately owned wagons in 1938:

Owner	*Number*	*Type*	*Capacity (tons)*	*Carrying*
H.C.B.	56	Tank	19·5–29·5	Palm oil
Petrocongo	24	Tank	19·5–29·5	Petrol
Cie des Produits et Frigorifères du Congo	3	Refrigerator van	19·5	Goods in cold storage
	83			

Staff

In order to operate and maintain the railway 163 Europeans and 4,224 Africans were employed in 1938.

Traffic and Traffic Control

During the year 1937, 199,365 tons of imported goods and 339,297 tons of goods for export, together with a flourishing local traffic, were hauled over the system. Thus the haul up was little more than half of the downward haul. Local, or between-station traffic, both up and down, amounted to 88,570 tons. The average weight hauled per train was 344 tons. It is calculated that in normal times the capacity of the line is 3 trains a day each way carrying 350 tons of goods. To run this number of trains 18 locomotives and 120 wagons, or 20 wagons per train, are required.

Of passenger traffic there is little information. In 1937 a total of 97,025 persons was carried over long and short distances. The trains are controlled by the Webb-Thomson electric pilot system, also by the dispatching system. Signals or semaphores are limited to a few important stations.

ITINERARY

Station	*Distance (km.)*	*Approx. height (metres)*	*Rivers, bridge spans, and tunnels*	*Remarks*
MATADI	0	0	..	Port of the Congo. Branch of line to Ango Ango, length 6·65 km. (4 miles).
	0·5	..	Tunnel 270 metres (885 ft.).	..
	1·5	..	Masonry viaduct of 5 spans of 8 m. (26 ft.) each.	..
MPOZO	8	68	R. Mpozo bridge, one span of 60 m. (197 ft.).	..
	Between 7 and 18	..	Bridge. One span of 40 m. (131 ft.).	There are other bridges in this section, but details are not known, neither can correct distances be given.
	,,	..	One viaduct (5 arches, each of 80 m. span, or 262 ft.).	
	,,	..	One viaduct (3 arches of 8 m. span or 26 ft.).	
	,,	..	Four bridges each of 20 m. span (65 ft.).	

Station	*Distance (km.)*	*Approx. height (metres)*	*River, bridge spans, and tunnels*	*Remarks*
	Between 7 and 18	..	Bridge. One span of 30 m. (98 ft.) and 3 spans of 80 m. (262 ft.).	
	,,	..	Tunnels of 127 m. (416·5 ft.) and 73 m. (239·5 ft.).	
KENGE	38	220	..	..
	60	425	..	Watershed between rivers Mpozo and Lufu.
LUFU	74	315	R. Lufu.	..
SONGOLOLO	93	425	..	Workshops.
	110	495	..	Watershed between the rivers Lufu and Kwilu.
KWILU	121	..	R. Kwilu. Bridge span of 80 m. (262 ft.).	..
KIMPESE	143	490	..	..
LUKALA	154	450	..	..
TUMBA	166	..	..	..
MOERBEKE	176	..	..	..
CATTIER	187	..	R. Gongo.	..
KOLO	194	500	..	..
DETHIER	198	..	..	..
	212	625	..	..
	220	669	..	..
MARCHAL	225	..	..	Branch to Thysville 15 km. (9 miles). The main repair shops are at Thysville.
	240	570	R. Inkisi. One span of 100 m. (328 ft.).	..
KISANTU	247	..	..	..
MADIMBA	266	580	..	..
SONA BATA	277	..	..	..
	300	635	..	..
KASANGULU	321	550	..	..
KIMUENZA	339	..	..	..
LEOPOLDVILLE EAST	365	310	..	Capital of the Belgian Congo.
LEOPOLDVILLE WEST	374	..	..	..
LEOPOLDVILLE PORT	..	..	..	Harbour facilities. River connexion with C.F.L., and B.C.K.

2. Chemin de Fer du Mayumbe (Revima) (Fig. 81)

BOMA–TSHELA

This is a short but important narrow-gauge railway which serves the hinterland of Boma, a portion of the Belgian Congo which is comparatively isolated from the rest of the country.

The construction of the railway was begun in 1898 by the Société des Chemins de Fer Vicinaux du Mayumbe. By 1901, 52 miles of the track—as far as the present station of Lukula—were completed. In 1907 the Government bought out the company, but the track was not completed to Tshela, 35 miles beyond Lukula, until 1913. Otraco took over the working of the line in July 1935. About the same time a new track was laid, and the gauge of the railway was very slightly reduced (from 61·5 cm. to 60 cm. or just under 2 ft.). Other improvements, still in progress in 1937, have been carried out, particularly in the region of the Bayunti and Bangu-Bangu valleys. Gradients have been reduced and curves flattened. The line was also being extended to the harbour at Boma. Surveys have been made for an extension towards the Brazzaville–Pointe Noire railway, but it does not appear that construction has begun.

DETAILED DESCRIPTION

The total length of the railway, which is single-track, is 87 miles (140 km.), and the highest point is 886 feet (270 m.) above mean sea-level. The gauge is 0·60 m., or nearly 2 feet. The rails, which are flat-bottomed, are 23·8 feet long and weigh 36 lb. per yard (18 kg./m.). They are bolted to steel sleepers which weigh 40 lb. (18 kg.) each. The maximum gradient is 1 in 22·2 (4·5%), but this is being reduced to 1 in 50 (2%). The minimum radius of the curves is being increased from 92 feet (28 m.) to 492 feet (150 m.).

Rolling-stock and its Maintenance

Information is not available as to the particular types of locomotives and rolling-stock in use, but it is known that, in 1937, there were 23 wood-burning locomotives, 6 passenger coaches, and 206 goods wagons. The passenger coaches included 2 first and second class, 2 third and fourth class, and 2 combination coaches. Some of the goods wagons are adapted for carrying timber from the Mayumbe forests to Boma. Railway stock of all types is repaired at the workshops at Lukula.

Staff

In 1936 the railway staff included 21 Europeans and 673 Africans.

Traffic

During 1937, 12,899, and in 1938, 13,658 passengers were carried on the railway for longer or shorter distances. During 1937, 12,610 tons of goods were hauled up country and 99,208 tons were brought down, or on an average 0·4 tons a day for every mile was hauled up country and 3·1 tons a day were brought down.

ITINERARY

Station	*Distance (km.)*	*Approx. height (metres)*	*Rivers, bridge spans, and tunnels*	*Remarks*
BOMA	0	24	Bridge over R. Luki.	There are many bridges on the railway, but particulars are not available.
	33	180	..	..
	52	67	..	..
	61	250	..	..
LUKULA	81	117	Bridge over R. Lukula.	At Lukula there are repair shops for locomotives and wagons. From Lukula river railway rises to highest point.
	130	270	..	Highest point on railway.
TSHELA	140	160	..	Forest region. The railway terminates south of the river Lubuzi.

3. CHEMIN DE FER DU CONGO SUPÉRIEUR AUX GRANDS LACS AFRICAINS (C.F.G.L.) (Fig. 82)

STANLEYVILLE–PONTHIERVILLE, KINDU–ALBERTVILLE

This single-track railway, originally of three sections, is divided into two by a navigable reach of the Lualaba river, of which full use is made for transport purposes. The sections are (*a*) Stanleyville–Ponthierville, (*b*) Kindu–Albertville.

In 1902 a Belgian company was floated to build a railway which would link the Congo river system with the central African lakes.

The Congo Government undertook the actual work of construction, and now holds a majority of shares in the company. Large river steamers, built in Belgium, were sent out to be re-erected at Leopoldville for the transport, from the Pool to Stanleyville, of materials for

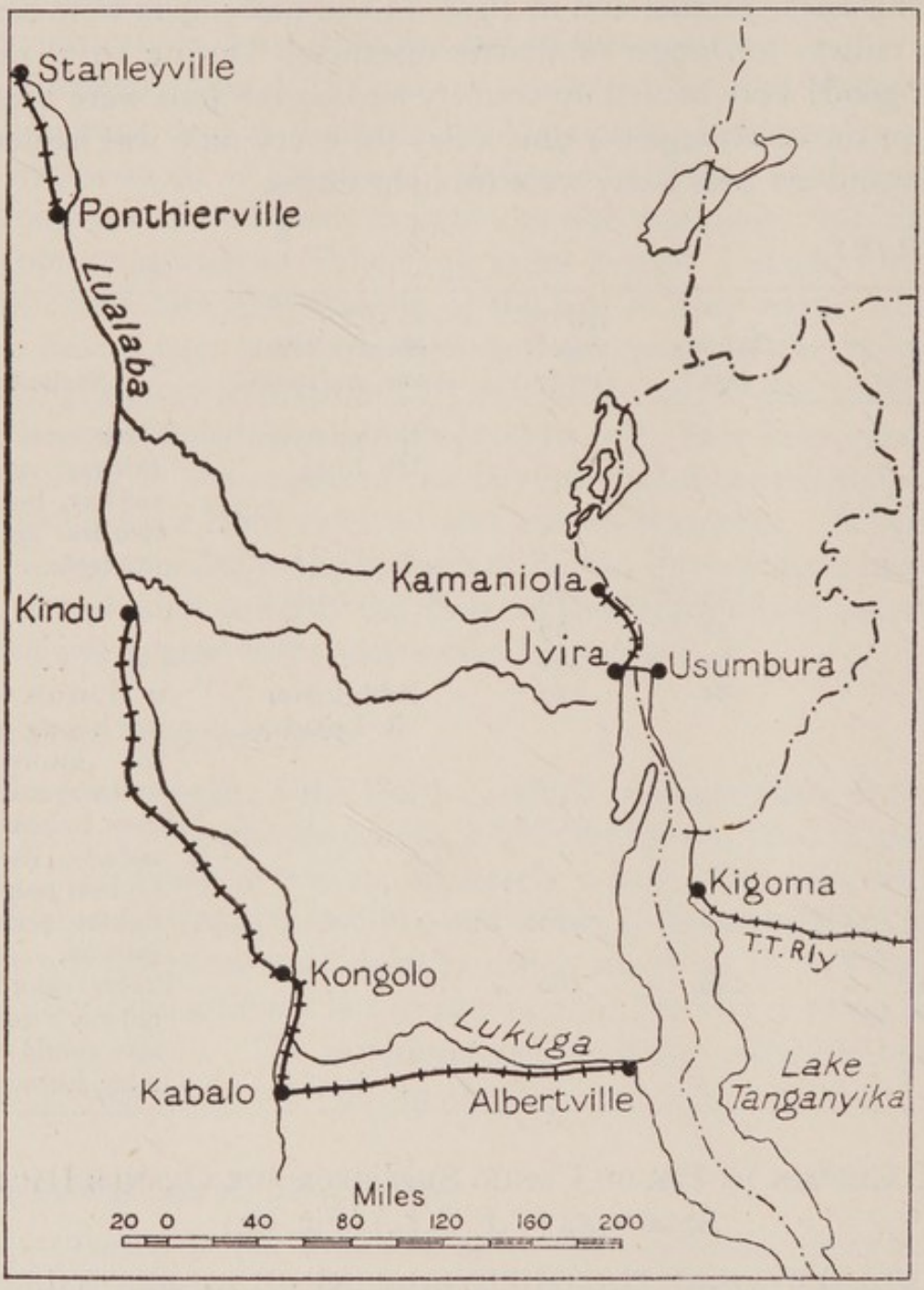


FIG. 82. *Chemin de Fer du Congo Supérieur aux Grands Lacs Africains*

the track, bridges, locomotives, and rolling-stock. All these materials were brought to Leopoldville over the C.F.C. railway.

Section (*a*), Stanleyville–Ponthierville, which by-passes the series of rapids terminating in Stanley Falls, was finished in 1906, and in its

turn carried forward the materials for section (*b*), Kindu–Albertville. Originally section (*b*) was divided into two. The first, Kindu to Kongolo, was built between 1906 and 1910, and the second was from Kabalo to Albertville, or as it was first called Kalime, on Lake Tanganyika. The journey from Kongolo to Kabalo, both on the Lualaba, was made by river steamers owned by the C.F.G.L. The railway from Kabalo reached the shores of Tanganyika in 1915, and was extensively used during the 1914–1918 war, in spite of the fact that some of the bridges were made of green timber. Finally a bridge was built to span the Lualaba near Kongolo and that place was linked with Kabalo by rail. This link was completed in 1939, and trains now run direct from Kindu to Albertville.

GENERAL DESCRIPTION

(*a*) *Stanleyville–Ponthierville.* The single-track railway between Stanleyville and Ponthierville forms a chord to the arc which the Lualaba river describes between these two places. It passes through forest country in which there is no great change of altitude. The obstacles which had to be overcome are the comparatively deep valleys of a number of tributaries of the Lualaba. The railway starts at the limit of navigation from Leopoldville, on the left or south bank of the Congo below the last cataract of the Stanley Falls series. Residential Stanleyville is on the right or north bank. The initial height of the railway above sea-level is 1,509 feet. At 65 miles from Stanleyville, between the Usengwe and Bikubi rivers, the highest point of the line (2,034 ft.) is reached. Ponthierville is 1,600 feet above sea-level. The line has little or no local traffic, but is an essential link in the chain of communication.

(*b*) *Kindu–Albertville.* Kindu is on the left or west bank of the Lualaba, at the limit of navigation from Ponthierville, for above the town the river is again obstructed by rapids. For the first 80 miles the course of the railway is generally parallel with the Lualaba, but at a distance of nearly 10 miles from it. There were few difficulties of construction in this section, which is in forest country.

Beyond the Lufube river the railway begins to edge away from the broken country through which the Lualaba flows, but has, nevertheless, to cross a range of hills.

Near Kongolo the Lualaba is spanned by a bridge 1,640 feet (500 m.) long, which, of course, is the most important bridge on the line. The railway to Kabalo follows the flat eastern or right bank of the Lualaba. The only important obstacle in this section is the

Lukuga river, 45 miles from Kongolo. At Kabalo (2,025 ft.), which is very little higher than the flood waters of the river, the railway leaves the Lualaba and strikes due east. Near Niemba (381 miles) it enters the gorge of the Lukuga, where it cuts the western wall of the Rift valley, and so reaches the shores of Lake Tanganyika. In this gorge difficulties were encountered; there is much cutting, and there are many curves. There are no tunnels in this or in the preceding section. Albertville, the terminus of the railway, is 2,630 feet above sea-level.

DETAILED DESCRIPTION

The total length of the two sections of the C.F.G.L. system is 522 miles:

Stanleyville–Ponthierville . .	78 miles (125 km.)
Kindu–Albertville . . .	444 miles (714 km.)

The gauge adopted is 3 ft. $3\frac{3}{8}$ in. (1·00 m.). It will be noted that this railway was constructed before the adoption of the 3 ft. 6 in. gauge elsewhere. There are two types of rails, both of which are flat-bottomed; the earlier type weighs 49 lb. per yard (24·4 kg./m.) and is 23 feet (7 m.) long, the later type weighs 60 lb. per yard (30 kg./m.) and is 32·8 feet (10 m.) long. Wooden sleepers are used throughout the section from Stanleyville to Ponthierville. They are treated with the preservative 'Creofix', and 2,100 sleepers are required per mile of track. Both wood and metal sleepers are used between Kindu and Albertville; the metal sleepers weigh 66 lb. each (30 kg.) and measure 5 ft. 7 in. by 8 in. overall. The track is stone-ballasted where stone is available, but much of the line is packed with earth. The maximum permissible gradient is 1 in 50 (2%), and the minimum radius of the curves is 492 feet (150 m.). As has already been noted, there are no tunnels on the whole system, but owing to deep cuttings the loading gauge is 12 feet × 10 feet (3·75 m. × 3·10 m.). Complete data concerning bridges are not available. There are fourteen in the Stanleyville–Ponthierville section. The longest are over the Malinda and Biaro rivers, but they do not exceed 210 feet in length. Of the Kindu–Albertville section information is still more scanty, but some of the longer bridges have been noted in the Itinerary.

Rolling-stock and its Maintenance

The following are details of locomotives which were reported to be in use in 1942:

Number	*Type*	*Wheel arrangement*	*Weight (tons)*
	Tank	0–4–0	14
22	—	0–6–0	21·5
	—	0–6–0	25·5
14	Mogul	2–6–0	27·5
6	,,	2–6–0	31·5
6	Mikado	2–8–2	52
2	Santa Fé	2–10–2	98·5
50	Total		

On the Stanleyville–Ponthierville section wood fuel is used. Coal is mined near Albertville, but it is not of very good quality. It has been used mixed with wood fuel in locomotives, but how far this practice is continued is not known. Experiments, said to have been successful, have been made with pulverized coal from the mines. Water-supply is arranged at places where it is most readily obtainable, and not necessarily at railway stations. Some locomotives may carry an auxiliary tender for both fuel and water.

Repair shops for locomotives and rolling-stock are at Stanleyville (south bank), Kindu, Kongolo, and Albertville. Kindu is the principal repair depot for the Kindu–Albertville section.

Coaches. Full details of rolling-stock are wanting. There were 35, or 36, passenger coaches in 1940, including 2 restaurant cars. The mixed first and second class carriages have seats for 48 passengers. A number of the coaches are said to be bogies, and all are fitted with automatic couplings and vacuum brakes.

Wagons. Most of the wagons are bogies, and they too are fitted with automatic couplings and vacuum brakes. They include the following:

No.	*Type*	*Capacity (tons)*
54	Covered goods	19·5
99	,, ,,	26·5
3	Crocodile	..
3	Fruit-carrying	..
17	Open, high side	19·5
19	,, ,,	27·5
29	Hopper	..
251	Unclassified	19·5–24·5
475	Total	

Staff

In 1936, 129 Europeans and 5,000 Africans were employed on the two sections of the railway.

Traffic and Traffic Control

Details of the traffic carried by either section of the C.F.G.L. are very meagre. In 1938 it was reported that 168,532 tons were carried over the entire system, that is, on an average, 162 tons per mile per annum or less than half a ton per mile per diem. During the same year 43,426 passengers were carried for long or short distances, or an average of 119 passengers per diem. There is no complete signal apparatus.

ITINERARY

This itinerary has been compiled from the latest information available (1938). More stations may have been built and others closed since that date.

1. *Stanleyville–Ponthierville*

Station	*Distance (km.)*	*Height (metres)*	*Remarks*
STANLEYVILLE	0	460	Principal repair shop. River connexion with Leopoldville.
LULA	7	..	The railway varies in level between the 0 and 105 km. pegs. It is never lower than the level at Stanleyville.
Km. 25	25	..	
BIARO	42	..	
Km. 65	65	..	
Km. 95	95	..	
Km. 105	105	620	Highest point on line.
PONTHIERVILLE	125	510	Terminus. River connexion with Kindu.

2. *Kindu–Albertville*

Station	*Distance (km.)*	*Height (metres)*	*Bridges*	*Remarks*
KINDU	0	550	Viaduct 105 m. (345 ft.) long in 8 spans immediately after Kindu.	Repair shops. River connexion with Ponthierville.
Km. 28	28	..	Bridge. Length unknown.	Over Mikilenge river.
			Bridge 120 m. (394 ft.) long.	Distance unknown.
LUEKI	56	..	..	..
	60	..	Bridge 134 m. (439 ft.) long.	Over Lueki river.
MATAMPA	83	..	..	..

Station	*Distance (km.)*	*Height (metres)*	*Bridges*	*Remarks*
	93	..	Bridge about 100 m. (328 ft.) long.	Over Lowe river.
KIBOMBO-GARE	117	..	..	Branch 10 km. (6 miles) to Mwasa on Lualaba.
LIKERI	164	..	..	..
	166	..	Bridge 116 m. (380 ft.) long.	Over Lufubu.
MALELA	187	..	..	..
LA SAMBA	228	..	..	Station for Kasongo.
LOENGO	245	..	..	..
Km. 273	273	..	Bridge. Length unknown.	Over Mulongoi river.
LUBUNDA	302	..	..	..
KONGOLO	355	620	Bridge 500 m. (1,640 ft.) long.	Secondary repair shop. Bridge over Lualaba. River connexion with Bukama.
LUKUGA	406	..	Bridge 160 m. (525 ft.) long.	Over Lukuga river near station.
KABALO	441	640	..	On Lualaba River. Connexions with Kongolo and Bukama.
LUIZI	505	..	Bridge. Length unknown.	..
NIEMBA	616	..	..	There are several bridges between Niemba and Albertville.
KILUBA	661	..	..	..
GREINERVILLE	701	870	..	..
ALBERTVILLE	714	830	..	Terminus and repair shop on Lake Tanganyika. Port. C.F.G.L. steamers connect with Kigoma, in Tanganyika Territory, whence railway (Tanganyika Railway) to Dar-es-Salaam. C.F.G.L. steamers also connect with Ruanda-Urundi ports at north end of lake.

4. Chemin de Fer du Bas-Congo au Katanga (B.C.K.) (Fig. 83)

Mention has already been made of a British company—Tanganyika Concessions Ltd.—which obtained an interest in the mining development of Katanga. Its founder, who was afterwards knighted and, as Sir Robert Williams, was well known as a South African pioneer and contemporary of Cecil Rhodes, promoted railways to connect the minefields with the coast. He obtained a concession from the Portuguese Government, running for 99 years from 28 November 1902,

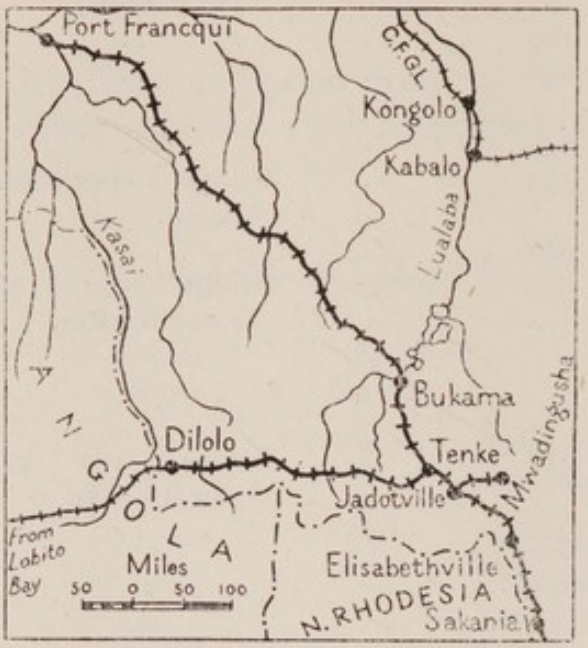


Fig. 83. *Chemin de Fer du Bas-Congo au Katanga*

for the construction of a railway from Lobito bay, through Angola, to the Katanga copper-fields. This important line, commonly known as the Lobito bay railway, but officially described as the Benguela railway, was to run along that watershed on which the old slave road from the centre of Africa found its easiest and best-graded path. After crossing the Benguelan plateau the alinement was to follow the Congo–Zambezi watershed. When consulted, the Belgian authorities proved anxious that the track should enter Belgian territory as far west as possible. In 1914, therefore, Belgium and Portugal agreed to a route which diverted the railway considerably north of the watershed. At Dilolo, where the line was to enter the Belgian Congo, Angola received a strip of territory, and the alinement from there to Tenke junction involved construction in many river crossings which the watershed would have avoided. Before the track reached Dilolo, however, more capital was required. Germany, which had obtained from Britain a recognition of her interests in Angola, offered to supply

the capital on condition that the company became German. The offer was not accepted. The company secured an advance of £1,250,000 under the British Trade Facilities Act, and the railway was completed with British capital as far as the Belgian frontier. The War of 1914–1918 caused much delay, and the frontier was not reached till 1927. Between 1928 and 1931 the Belgian railway company (B.C.K.) built a line from Tenke junction to join the Lobito bay railway at Dilolo. Before the outbreak of war (1939) an express train, with sleeping and restaurant cars, ran weekly in each direction between Lobito bay and Elisabethville, to connect with British, Belgian, and Portuguese mail steamers. The through journey took three days.

Sir Robert Williams was also responsible for forming the Rhodesia–Katanga junction railway company. By 1909 this company had extended the Rhodesian railway system northwards to the Belgian frontier. Between 1909 and 1928 the B.C.K. extended the line, first to Elisabethville in 1910, then to Bukama on the Lualaba in 1918, and finally to Port Francqui on the Kasai in 1928. By this connexion Elisabethville is 946 miles from Buluwayo, whence fast passenger trains run to Capetown in 45 hours, and to Beira in 31.

GENERAL DESCRIPTION

For the purposes of a general description the B.C.K. can be divided into three sections:

1. Sakania–Bukama.
2. Bukama–Port Francqui.
3. Tenke–Dilolo.

Sakania–Bukama. Sakania, on the Belgian side of the frontier between the Belgian Congo and Northern Rhodesia, lies at an altitude of 4,126 feet. From this station the railway gradually rises to 4,513 feet at Kasumbalesa station (95 miles); it then generally falls for the next 55 miles to 3,988 feet at Munama in the valley of the Kafubu river. Elisabethville, 9 miles from Munama, is the most important station on the whole railway system; it is 4,034 feet above sea-level. A short branch connects the *Étoile du Congo* and the mines at Lubumbashi with the capital. Twenty-nine miles farther on the line rises to 4,507 feet at Chila Tembo on the watershed between the Lufira and Luapula rivers, only to descend in the next 38 miles to cross the Lufira at 3,663 feet. The crossing is near Kapolowe station, 15 miles beyond which there is the junction of Kamatanda (3,962 ft.) with branches to Jadotville, to Kambove, and to Panda. There is yet

another junction, 12 miles from Kamatanda, at Luambo station, where a branch 37 miles long extends to the power station at Mwadingusha which derives its power from the Cornet falls. The main line, following a switchback profile, crosses in turn the Luambo, Mulungwishi, Dilomba, Dulukuwe, and Dipeta rivers, the last at 3,706 feet. In the 20 miles west of the Dipeta the line rises to 4,790 feet at Tenke, which is the junction for the Dilolo–Lobito bay railway. Beyond Tenke it continues to gain altitude for 21 miles as it climbs up to and over the Biano massif, and reaches its highest point 5,300 feet above sea-level, at Dinlungu Yulu station. The country in this region is very fertile. From Dinlungu Yulu it descends northwards from the massif to the valley of the Lualaba, and in so doing loses about 3,410 feet in 114 miles. Bukama (1,886 ft.) is on the Lualaba and was for some time the railhead of the line from Sakania. It is connected by steamer and barge service with Kabalo on the C.F.G.L.; this route was used to transport copper to Europe, via Albertville, Kigoma, and Dar-es-Salaam. At Bukama there are engine sheds, also the longest bridge on the line which carries the railway across the river in four spans of 196 feet each and one short span of 16 feet.

Bukama–Port Francqui. This was a difficult section to construct and is probably expensive to maintain. The railway follows a circuitous route out of the valley of the Lualaba, avoids the Hakansson mountains, but climbs to Kamina, 3,657 feet, in 90 miles. This is the highest point in the section, and from it the line falls, although with many intermediate rises, to Port Francqui on the Kasai at 1,160 feet above sea-level. The length of the section is 698 miles. The course of the line from Kamina is north-west, that is diagonally across the northern slopes of the southern highlands and, of necessity, crosses the numerous and sometimes deeply entrenched tributaries of the Lomami, Sankuru, and Kasai, which rise on the highlands and generally flow north. It has been necessary to build numerous bridges with difficult approaches.

To quote one report on the railway, there is 'no excessive climbing . . . but the railroad, cut through forests in many places, afforded some awkward corners and gradients'. The corners—or more properly curves—and gradients are due to the rivers. Port Francqui is the present terminus of the B.C.K.; it is connected with Leopoldville by a river-transport system.

Tenke–Dilolo. This section suffers from the same geographical disadvantages as does the last. It follows a westerly course across the

slopes of the southern highlands parallel to, but north of, the Congo–Zambezi watershed, so that it has to contend with the same entrenched streams flowing north across its path. The highest point of the line is at Tenke (4,790 ft.). In 37 miles it drops to cross the upper course of the Lualaba at 4,003 feet and rises in 22 miles to 4,733 feet at Kolwezi, where there are copper mines. The general height of the highlands is round about 4,500 for the next 100 miles, but the railway has been unable to maintain this level; it falls to, and rises from, the Lufupa, a river which it crosses by a single-span bridge 137 feet long at a level of 3,542 feet. From Lufupa station, at 112 miles and 3,750 feet altitude, the line gradually loses height, in spite of many minor ascents, till the frontier of Angola is reached a mile beyond Dilolo station. Dilolo is 3,250 feet above sea-level, 323 miles from Tenke and 840 miles from Lobito bay.

DETAILED DESCRIPTION

The total length of the B.C.K. single-track railway is:

		Miles
Section 1.	Sakania–Tenke 306 miles Tenke–Bukama 135 „	441
Section 2.	Bukama–Port Francqui	697
Section 3.	Tenke–Dilolo	323
	TOTAL	1,461

The distances in miles between some of the more important stations on the line are:

	Port Francqui	*Lulua-bourg*	*Bukama*	*Dilolo*	*Elisabeth-ville*	*Sakania*
Port Francqui	0	262	697	1,155	980	1,138
Luluabourg	262	0	435	893	718	876
Bukama	697	435	0	458	283	441
Dilolo	1,155	893	458	0	469	628
Elisabethville	980	718	283	469	0	158
Sakania	1,138	876	441	628	158	0

The standard gauge of South Africa, 3 ft. 6 in. (1·067 m.), has been adopted throughout as on the C.F.C. The rails are flat-bottomed, weighing 60 lb. per yard (30 kg./m.), and are 32·8 feet long (10 m.). They are bolted to steel sleepers, of which there are three types weighing respectively 70 lb. (31·6 kg.), 75 lb. (34 kg.), and 92 lb. (42 kg.). There are usually 13 sleepers to a rail of 32·8 feet. The track weighs 190–206 tons per mile, which permits an axle-load of 14·75 tons,

although in section 1 the load probably should not exceed 9·8 tons. It is reported that experiments have been made with wooden sleepers in section 2, but nothing is known of the results.

Stone ballast is used where suitable stone is readily available, and its use is being extended. The maximum gradients and minimum radius of curves allowed are:

Section	*Maximum gradient*	*Minimum radius of curves*
1. Sakania–Bukama	1 in 80 (1·25%)	656 feet (200 m.)
2. Bukama–Port Francqui	1 in 66 (1·5%)	492 feet (150 m.)
3. Tenke–Dilolo	1 in 66 (1·5%)	492 feet (150 m.)

Railway stations, or crossing places, are rarely over 15 miles apart; the average distance between them is about 10 miles.

Bridges. The following list, which is not exhaustive, is an indication of the spans of the longer bridges on the three sections.

Span		*Number of bridges*		
Metres	*Feet*	*Section 1*	*Section 2*	*Section 3*
10	33	4	3	..
11	36	..	..	4
12	39	..	1	..
15	49	6	3	..
16	52	..	..	1
23	75	2	..	..
25	82	1	5	..
26	85	..	..	2
27	88	1	..	..
30	98	..	2	..
40	131	1	3	..
42	137	..	..	3
50	164	3	..	..
52	170	..	..	3
70	229	..	1	..
80	262	..	..	1
84	275	..	1	..
104	341	..	..	1
120	393	..	1	..
250	820	..	1	..

There are many more bridges and culverts of smaller spans than those shown in this table. There do not appear to be any over bridges or tunnels on the B.C.K.

Rolling-stock and its Maintenance

In 1940 it was reported that there were 139 locomotives in service

and of these over 90 were working in section 1 (Sakania–Bukama). The following types of locomotives were mentioned:

Locomotives

Wheel arrangement	*Weight in running order (tons)*	*Tractive force (lb.)*
2–6–2	47·7	13,120
4–8–0	68	..
2–8–2 (Mikado)	71	26,900
2–8–2	71·6	..
2–8–2	75·1	26,675
2–8–2	116	..
2–8–2	123	..

These locomotives burn either coal or wood. The wood-burning types are in use on sections 2 and 3. In 1940 there were 21 water-filling stations in section 1 and 36 in section 2. They are from 10 to 20 miles apart. Running sheds are to be found at the following stations:

Section 1 (Sakania–Bukama): Kabumba, Tshinsenda, Elisabethville, Bukama.

Section 2 (Bukama–Port Francqui): Kamina, Luputa, Lulua, Mweka.

Modern railway workshops for the erection and repair of locomotives are maintained at Elisabethville, and for carriages at Jadotville. In 1929 about 100 Europeans and 600 Africans were employed in the Elisabethville workshops. There are also workshops on section 2 at Kamina and Mweka.

Coaches and Wagons. Particulars of the types of coaches and wagons in use are wanting and reports differ as to numbers. In 1940 there were said to be either 57 or 71 passenger coaches of all types in use, all fitted with central automatic couplings and most with automatic brakes. An estimate of the number of wagons of all types in use varies from 1,321 to 1,713. There are over 400 bogie-hopper wagons with a capacity of 34–39 tons which are used for the transport of ore, and probably as many covered wagons for general traffic. Carriages and wagons are not cut off at the frontiers (Sakania and Dilolo), but locomotives are changed. There is a give-and-take arrangement between each railway system in the matter of rolling-stock. Owing to the heavy gradients which the nature of the country demands, a section of the Lobito bay railway is worked on the rack and pinion system. 175 B.C.K. open wagons have been adapted to pass over this section, but Rhodesian railway wagons have not been so adapted.

Staff

In 1938 there were 363 Europeans and 7,424 Africans employed on the B.C.K. system.

Traffic

Accurate figures of the volume of traffic carried by the railway during recent years are almost entirely lacking. During 1938 the total tonnage hauled both up and down section 1 of the line, between Sakania and Bukama, was approximately 2,720,000 tons. The greater part of this tonnage was for mineral traffic, largely between mine and reducing plant. During the same period the traffic on the other two sections combined amounted to slightly less than one-sixth of this total. During the first 10 months of 1942 the average tonnage hauled on section 3 (Tenke–Dilolo) was 5,150 tons a month, and this again was almost entirely mineral traffic. According to some calculations the normal capacity of section 2 is 3 trains a day in each direction.

During 1938 the passenger traffic on section 1, for long or short distances, amounted to 180 persons per diem.

The average time taken to cover the 980 miles between Port Francqui and Elisabethville is 56 hours, and between Elisabethville and Sakania (158 miles) 8 hours.

ITINERARY

Sections 1 and 2

Station	*Distance (km.)*	*Height (metres)*	*Rivers and bridge spans*	*Remarks*
	0	..	..	Rhodesian frontier.
*Sakania	13	1,258	..	Running sheds.
Kabumba	24	1,302	..	..
*Kipula	40	1,273	..	..
Mokambo	63	1,320	..	Branch to Mufielira in Northern Rhodesia.
*Kabemba	84	1,284	..	..
Lubembe	102	1,271	..	..
*Tshinsenda	126	1,311	..	Running shed.
Kasumbalesa	152	1,376	..	Iron mine.
Mushoshi	176	1,305	..	..
Kafuira	192	1,300	..	..
Welgelegen	204	1,314	..	..
Baya	230	1,268	..	..
	240	..	R. Munama. Bridge span of 15 m. (49 ft.).	..

* Water-filling stations.

Station	*Distance (km.)*	*Height (metres)*	*Rivers and bridge spans*	*Remarks*
*MUNAMA	241	1,216	..	Junction of branch to Kipushi mine (34 km. or 21 miles).
	250	..	R. Kafubu. Bridge. One span of 27 m. (88 ft.).	..
*ELISABETHVILLE	255	1,230	..	Mining centre. Locomotive and carriage repair shops and running sheds: junction for branches to Étoile du Congo (12 km. or 7 miles) and to Lubumbashi (5 km. or 3 miles).
*LUKUNI	275	1,344	..	..
TUMBWE	290	1,512	..	..
CHILA TEMBO	302	1,374	..	..
*SOFUMWANGO	319	1,284	..	..
CHILA SIMBA	332	1,266	..	..
LUISHIA	347	1,242	..	Copper mine near town.
KAPOLOWE	363	1,117	R. Lufira. Bridge. One span of 50 m. (164 ft.).	..
N'GOY	378	1,210	..	..
*KAMATANDA	388	1,208	..	Junction of branch to Jadotville (8 km. or 5 miles), Kambove (25 km. or 16 miles), and Panda - Kakontwe (5 km. or 3 miles). Locomotive depot and repair shops at Jadotville, which is a mining centre.
	407	..	R. Luambo. Bridge. One span of 50 m. (164 ft.).	..
LUAMBO	408	1,200	..	Junction of branch to Mwadingusha power station at Chutes Cornet (59 km. or 37 miles).
*MULUNGWISHI	422	1,170	..	..
	427	..	R. Mulungwishi. Bridges.	No details available.

* Water-filling stations.

Station	*Distance (km.)*	*Height (metres)*	*Rivers and bridge spans*	*Remarks*
MUTAKA	434	1,160	..	..
	435	..	R. Dilomba. Bridge. One span of 15 m. (49 ft.).	..
			R.Dulukuwe.Bridge. Two spans each of 25 m. (82 ft.).	..
GUBA	449	1,130	..	..
	460	1,130	R. Dipeta. Bridge. One span of 25 m. (82 ft.).	..
*FUNGURUME	463	1,165	..	..
KWATEBALA	476	1,405	..	..
*TENKE	492	1,460	..	Junction with Lobito bay railway.
	494	..	R. Tshilongo. Bridge. One span of 15 m. (49 ft.).	..
*TSHILONGO	506	1,583	..	..
GULE	518	1,503	R. Gule. Bridge. One span of 15 m. (49 ft.).	..
DINLUNGU YULU	526	1,616	..	Highest point on the line.
*KANSENIA	538	1,583	..	..
	541	..	R. Kalule.	..
BIANO	552	1,591	..	..
	560	..	R.Tshiyoye. Bridge. One span of 15 m. (49 ft.).	..
*KALULE S.	565	1,475	..	..
KASINGA	584	1,454	..	..
	600	..	R. Lubudi. Bridge. One span of 40 m. (131 ft.).	..
LUBUDI	605	1,300	..	..
BUYOFWE	623	1,025	..	..
*KIKOSA	629	980	..	..
*KALULE N.	639	879	R. Kalule. Bridge. One span of 50 m. (164 ft.).	..
MUKULAKULU	661	775	..	..
*LUENA	676	670	..	..
*BUKAMA	710	575	..	River port. Steamer connexion with C.F.G.L. Running shed.
	711	..	R. Lualaba. Bridge. Four spans of 60 m. and one of 5 m. Total length 245 m. (804 ft.).	..

* Water-filling stations.

Station	*Distance (km.)*	*Height (metres)*	*Rivers and bridge spans*	*Remarks*
KILENGE	727	614	..	..
*MALONDO	746	681	..	..
KIKOWA	759	775	..	..
*KABONDO DIANDA	772	906	..	..
KALAI	787	959	..	..
*KIBULA	798	1,052	..	..
LUVUA	816	910	..	..
	818	..	R. Luvua. Bridge. One span of 25 m. (82 ft.).	..
	832	..	R. Lovoi.	..
*KIAVIE	833	..	..	..
*KAMINA	855	1,115	..	Running shed. Repair shop. Highest point between Bukama and Port Francqui.
KIKOKO	872	1,107	..	..
*KASAO	887	1,084	..	..
MUKISHI	896	1,101	..	..
	903	..	R. Lomami. Bridge. One span of 40 m. (131 ft.).	..
*KATONGOLA	915	1,095	..	..
MULEBA	929	1,083	..	..
ZAILA	944	1,096	..	..
*TSHIPASA	958	1,046	..	..
	972	..	R. Luembe. Bridge. One span of 40 m. (131 ft.).	..
KABWE-KATANDA	973	1,005	..	..
*KIMPANGA	990	986	..	..
KISHINDE	1,003	939	..	..
	1,012	..	R. Lubishi. Bridge. One span of 40 m. (131 ft.).	..
*KIMANDA	1,014	883	..	..
	1,015	..	R. Luania. Bridge. One span of 30 m. (98 ft.).	..
MUSAKA	1,030	860	..	..
*KANIAMA	1,046	860	..	..
	1,047	..	R. Luoa. Bridge. One span of 25 m. (82 ft.).	..
MWADI KAYEMBE	1,058	840	..	..

* Water-filling stations.

Station	*Distance (km.)*	*Height (metres)*	*Rivers and bridge spans*	*Remarks*
*KISAMBA	1,076	812	..	..
	1,083	..	R. Lubilash. Bridge of three spans each of 40 m. (131 ft.).	..
LUSUKU	1,094	852	..	..
TSHABOBO	1,110	889	..	..
*LUPUTA	1,126	875	..	Running shed.
	1,143	..	R. Luilo. Bridge of two spans each of 40 m. (131 ft.).	..
KALENDA	1,149	828	..	..
*MUENE DITU	1,168	952	..	..
LUKOLA	1,185	825	..	..
	1,193	..	R. Bushimaie. Bridge. One span of 70 m. (230 ft.).	..
*KELE	1,205	884	..	..
	1,220	..	R. Lubi. Bridge. One span of 25 m. (82 ft.).	..
LUBI	1,227	882	..	..
	1,230	..	R. Luekeshi. Bridge. One span of 30 m. (98 ft.).	..
*LUEKESHI	1,246	818	..	..
KAMPONDE	1,258	875	..	..
*KAULU	1,275	876	..	..
TSHIMBULU	1,295	862	..	..
*FUAMBA	1,310	828	..	..
BITANDA	1,326	776	..	..
*MUTEFU	1,342	750	..	..
KAMWANDU	1,359	754	..	..
*KALUMBA	1,373	708	..	..
	1,380	..	R. Lubi-Nampata. Bridge. One span of 15 m. (49 ft.).	..
KATUMANGA	1,391	676	..	..
*LULUABOURG	1,411	630	..	Running shed.
	1,415	..	R. Tshibashie. Bridge. One span of 25 m. (82 ft.).	..
*TSHIBASHIE	1,425	535	..	..
	1,440	..	R. Tshibungu. Bridge. One span of 15 m. (49 ft.).	..
ZAPO-ZAPO	1,446	612	..	..
*TSHIBUNGU	1,462	505	..	..
*DEMBA	1,484	610	..	..
BENA KADIEBWE	1,495	589	..	..

* Water-filling stations.

Station	Distance (km.)	Height (metres)	Rivers and bridge spans	Remarks
*Tshibambula	1,511	591	..	..
Kashama	1,526	560	..	..
*Bena Leka	1,542	562	..	Wood-working industry.
Beya Bwanga	1,552	575	..	..
Bakwa Balaie	1,567	580	..	..
*Katanga	1,569	580	..	..
Bakwa Kengo	1,579	586	..	..
*Luembe	1,591	482	..	..
Kakenge	1,602	579	..	..
*Kinda	1,623	585	..	..
Bena Longo	1,642	548	..	..
*Mweka	1,661	569	..	Running shed. Repair shop.
Bulongo	1,678	535	..	..
*Bongo	1,697	535	..	..
Domiongo	1,717	531	..	..
*Kabwe	1,731	501	..	..
N'Kosh	1,748	510	..	..
*Pebeangu	1,763	535	..	..
Imambamba	1,781	505	..	..
*Kabote	1,793	516	..	..
Bukaka	1,805	524	..	..
*Malu Malu	1,820	481	..	..
*Port Francqui	1,833	354	..	Port on R. Kasai. Terminus. River connexion with C.F.C.

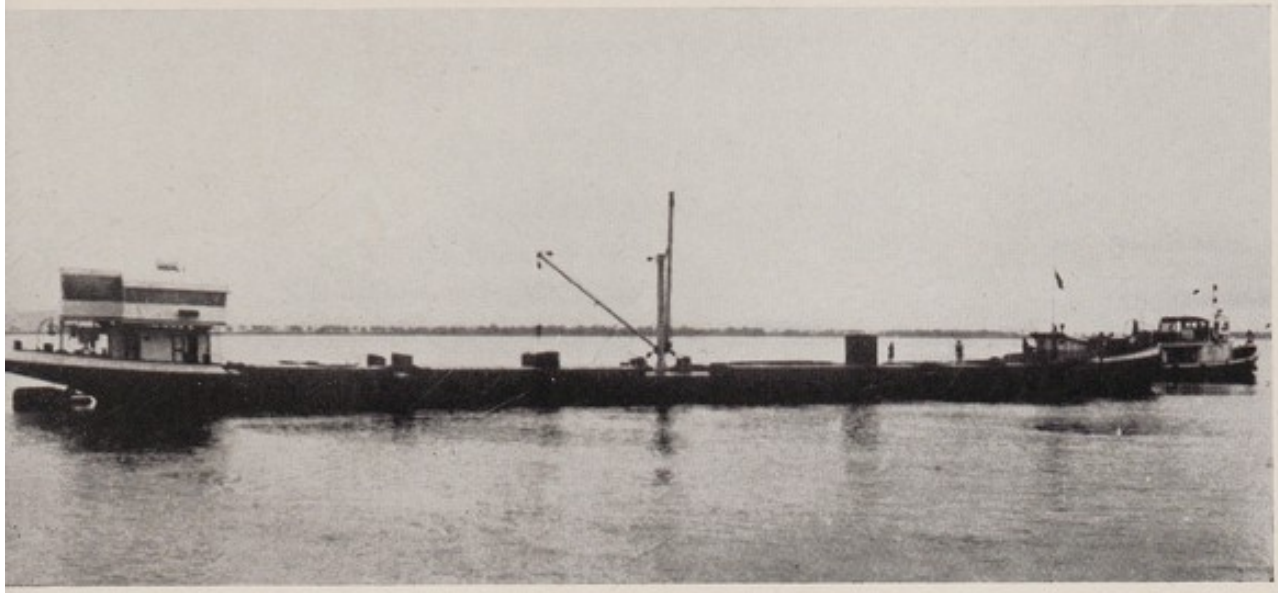
There are a number of rivers other than those in this schedule over which there are bridges, but no details of them are available.

* Water-filling stations.

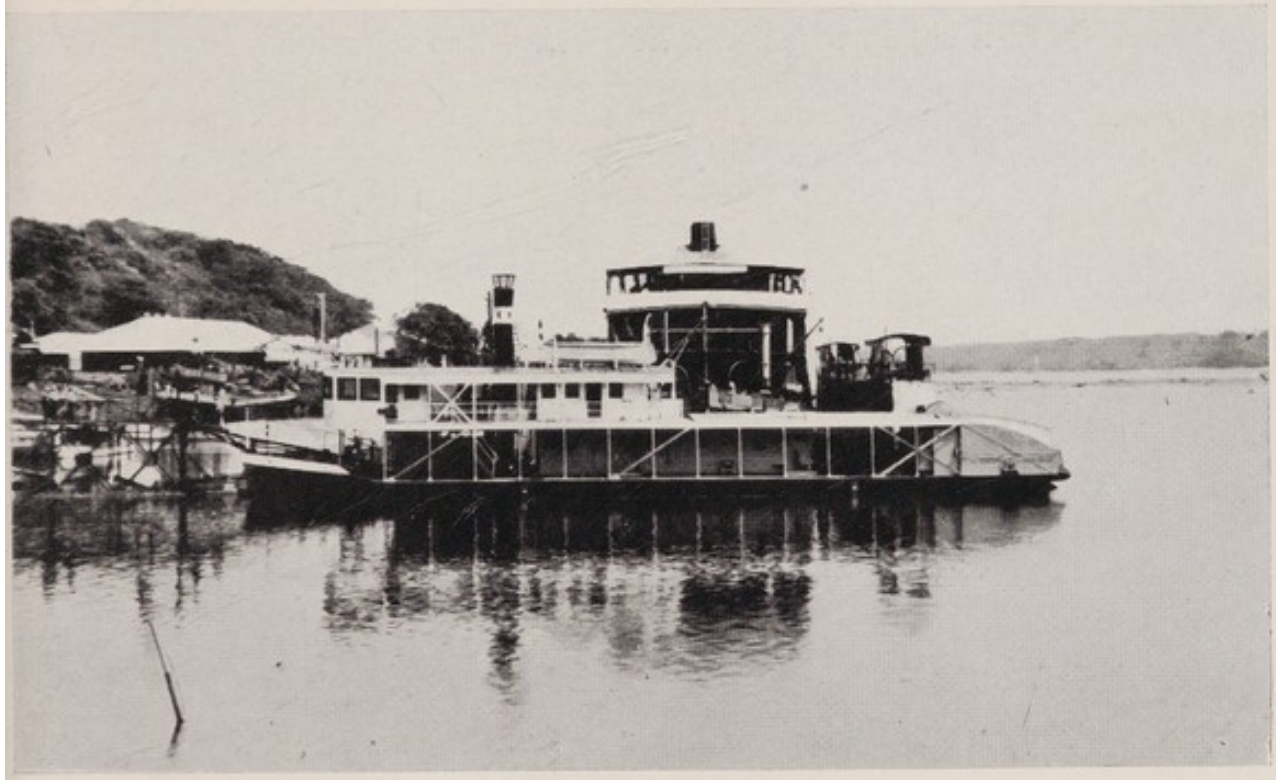
Section 3

Station	Distance (km.)	Height (metres)	Rivers and bridge spans	Remarks
				There is a water supply at each station.
Tenke	0	1,460	..	Junction with the line from Sakania to Port Francqui.
	15	1,500	..	..

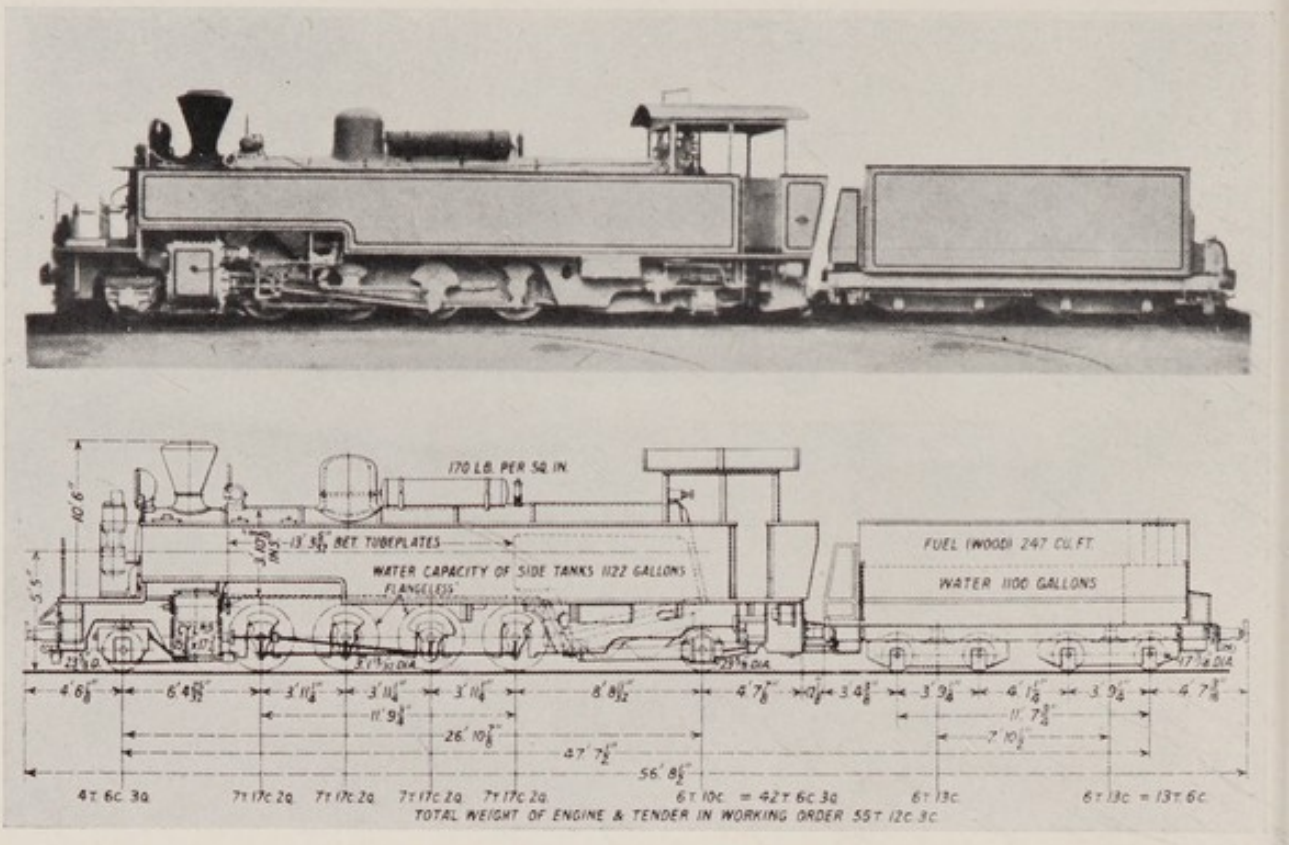
Station	*Distance (km.)*	*Height (metres)*	*Rivers and bridge spans*	*Remarks*
KISANFU	29	1,460	..	..
KISENDA	46	1,350	..	..
LUALABA	59	1,241	..	..
	60	1,220	R. Lualaba. Bridge of two spans of 52 m. (170 ft.).	..
KOLWEZI	95	1,443	..	Copper mines.
	100	1,430	R. Musonoi.	..
	115	1,400	R. Potopoto.	..
KIALA	124	1,390	..	..
KANZENZE	150	1,125	..	..
LUFUPA	182	1,443	..	..
	188	1,080	R. Lufupa. Bridge. One span of 42 m. (137 ft.).	..
	206	1,060	R. Kasempa.	..
KAYEMBE	212	1,027	..	..
	220	1,010	R. Lubudi. Bridge. One span of 52 m. (170 ft.).	..
TSHIANDA	231	1,050	..	..
MUTSHATSHA	252	1,217	..	Locomotive depot.
	270	1,090	R. Mukuleshi. Bridge. One span of 52 m. (170 ft.).	..
LUGENDA	280	1,090	..	..
	286	1,100	R. Musengji.	..
	306	1,100	R. Lupweji.	..
MUNGULUNGA	314	1,130	..	..
	316	1,125	R. Mungulunga.	..
KAKOPA	356	..	..	..
KASAJI	382	1,011	..	..
MALONGA	415	959	..	..
	417	..	R. Lukoshi. Bridge. One span of 42 m. (137 ft.).	..
DIVUMA	451	1,042	..	..
	460	..	R. Lulua. Bridge. One span of 52 m. (170 ft.).	..
KAHUNDU	482	1,078	..	..
DILOLO STATION	519	991	..	..
ANGOLA FRONTIER	522	975	R. Luao. Bridge. One span of 42 m. (137 ft.).	The railway continues from Luao, in Angola, to the port of Lobito bay (1,347 km. or 836 miles from the frontier).



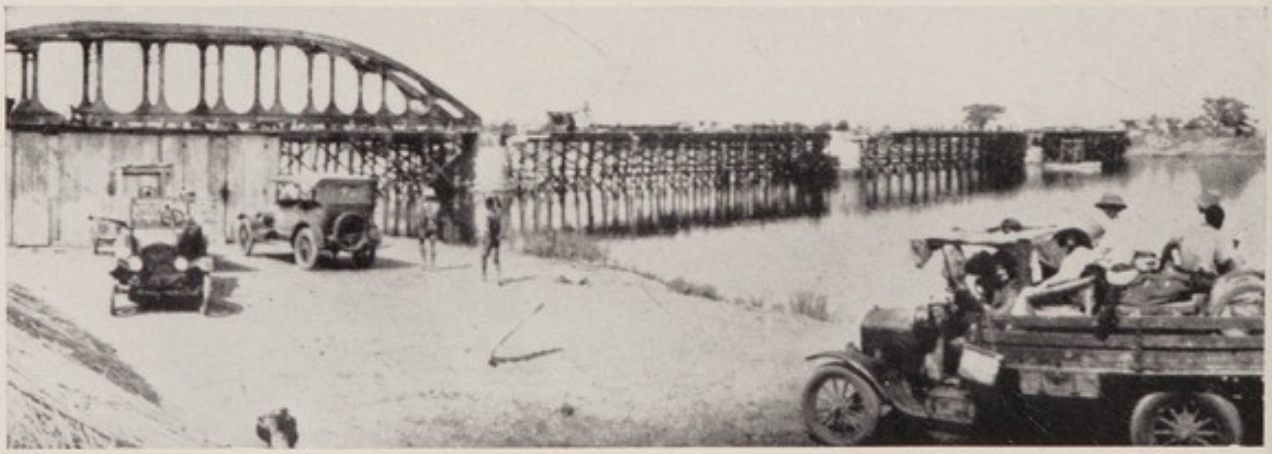
98. *Barge of 980 tons (1,000 tonnes) capacity. Trains of barges are towed by tugs such as shown on Plates 96 and 99*



99. *Sternwheel tug of 125 h.p. Behind it is a large river craft undergoing repair on the floating dock of Chanic at Kintamo. The broken water at the head of the rapids can be seen on the right—level with the top of the dock wall*



100. *Wood-burning 2-8-2 locomotive, Vicicongo Railway*



101. *Bridge over Lualaba river at Bukama*

5. Société des Chemins de Fer Vicinaux au Congo (Vicicongo) (Fig. 84)

AKETI–MUNGBERE; KOMBA–BONDO

The Vicicongo is narrow gauge (60 cm. or slightly under 2 ft.) and single-tracked. It has been developed to serve the agricultural, and particularly the cotton, areas of the Uele region in the north-east of the colony. The railway was one of small beginnings. Some of the track and rolling-stock was first used behind the Allied front, in France, during the War of 1914–1918, and this emergency material has dictated the gauge of Vicicongo.

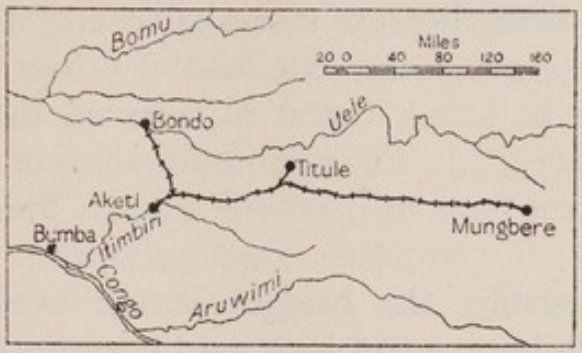


Fig. 84. *Chemins de Fer Vicinaux au Congo* (*Vicicongo*)

The originators of the scheme saw that it was possible to connect the navigable reaches of the Itimbiri and Uele rivers with a good and growing road system, and thereby to link a region of great economic value with Leopoldville, attracting to that port the traffic which might otherwise go towards the Nile. The point selected for the commencement of the new railway was Aketi (or Port Chaltin) on the Itimbiri at the limit of navigation from Leopoldville. The railway, which may appear to be isolated on a map, has river connexion with the C.F.C. and also with the C.F.G.L. and B.C.K.

The work of construction was authorized in 1923. By 1926, 17 miles of track had been laid; by May 1928 the line had reached Bondo, on a navigable reach of the Uele, 94 miles from Aketi. The line was then extended eastward from Komba (Djamba) through the important administrative post of Buta to Zobia, 195 miles from Aketi. A branch left the line at Lienartville, continuing 19 miles northwards to Titule, where cotton is ginned. In 1934 the line was pushed forward to, and beyond, Paulis (Isiro), so that, by 1937, the eastern terminus had reached Mungbere, 426 miles from Aketi. Plans have been made to extend the line still farther eastwards—to the Kilo–Moto gold-mining area. Although the Vicicongo system

is but a light railway, it operates comparatively powerful locomotives, weighing 55–59 tons. It has proved to be a valuable link in trans-continental communications. Supplies from America for the armies in Egypt passed over it when the Mediterranean was blocked.

DETAILED DESCRIPTION

The Vicicongo railway has a gauge of 1 ft. 11⅝ in. (0·06 m.), which is very slightly widened on curves. The rails are flat-bottomed, weighing 35 lb. per yard (17·5 kg./m.), and are 32 ft. 9 in. long. Steel sleepers weighing 22 to 26½ lb. (10–12 kg.) are used throughout, but only portions of the line are stone-ballasted. The track so constructed will carry a maximum axle-load of 9 tons. The maximum gradient was 1 in 50 (2%), but it is believed that this has been reduced to 1 in 66⅔ (1·5%). The minimum radius of the curves on the main line is 656 feet (200 m.); on the branch lines it is as low as 164 feet (50 m.).

Information regarding the bridges is not available; the most important is said to be 213 feet long, and it appears that all bridges have been built with sufficient clearance and presumably with adequate strength to carry the standard 3 ft. 6 in. gauge (1·067 m.).

Rolling-stock and its Maintenance

Locomotives (Plate 100). In 1940 the following locomotives were at work:

Number	*Wheel arrangement*	*Weight in working order (tons)*	*Tractive force at 75% boiler pressure (lb.)*
3	2–8–2 Mikado	59	14,990
14	0–6–2	34	9,750
20	0–6–2	19½	5,700

Several more 2–8–2 locomotives were built for the railway by Messrs. W. G. Bagnall of Stafford in 1943; the number is unknown. Their weight in working order is slightly less than that of those mentioned in the above list, but their tractive force is about the same. All locomotives are side-tankers, and those used for heavy traffic are provided with auxiliary tenders to carry extra fuel and water. The distance between watering points is 18–19 miles. The principal repair shops are at Aketi, but there are others at Lienartville and Paulis.

Coaches and Wagons. In 1940 the coaches and wagons in use included the following:

No.	*Vehicles*	*Type*	*Capacity*
4	Passenger coaches	..	..
119	Goods wagons:	Covered	9·85 tons
28		Open	..
2		Tank	..
3		Service	..
83	Unclassified	..	Mostly open wagons of 4·9 tons capacity.
239			

Probably a 6-ton travelling crane is included in the last item. Central automatic couplings are used on all stock; the braking system is hand-operated.

Staff

In 1935, 81 Europeans were employed on the railway and a considerable number of Africans.

Traffic

The total number of passengers who travelled on the railway in 1938 was 5,794. The journey from Aketi to Mungbere takes from 40 to 45 hours. In 1938 also the total tonnage of merchandise hauled over the system was 50,600 tons. The maximum capacity of the Aketi–Mungbere line is said to be 2 trains a day in each direction, each carrying 56 tons. To haul this load over 426 miles requires 28 locomotives and 192 wagons.

Motor Vehicles operated by Vicicongo

In 1940 the company's fleet of lorries and trucks contained the following:

No.	*Type*	*Capacity (tons)*
24	Lorry, Diesel	10 (with trailer) running on cotton-seed oil produced in the colony.
45	Trucks, Chevrolet	3
51	Trucks, Dodge	4
24	,, ,,	3
41	,, Minerva	4 } Old, but in serviceable
9	,, ,,	3 } condition.

ITINERARY

1. *Aketi–Mungbere*

Stations	*Halts (with crossing loops)*	*Distance (km.)*	*Remarks*
AKETI	..	0	Main workshops. Port on R. Itimbiri. Branch 2 km. (1½ miles) long to fuel yard.
	Komba	30	Junction of branch to Bondo.
	Guma	39	..
	Bilu	51	..
	Lalu	79	..
	Cattebeke	90	..
	Kotili	104	..
	Buta (triangle)	128	Branch 3 km. (2 miles) to Buta station. Buta is on R. Rubi, but the railway does not cross it.
	Bali	141	..
	Mbwata	165	..
	Rubi	196	..
	Monbunga	230	..
LIENARTVILLE	..	259	Junction of branch of 31 km. (19 miles) to Titule. Workshops for minor repairs.
	Benge	298	..
	Zobia Gauche	314	On north of railway.
ZOBIA DROITE	..	327	On south of railway.
MALU	..	349	..
	Nemanzi	368	..
	Mabara	394	..
	Moygamu	399	..
MAWA	..	434	..
	Nezorada	453	..
	Ekifure	462	..
	Modzaba	475	..
EGBUNDA	..	505	From here to the terminus the country is agricultural, producing cotton and coffee.
	Neisu	532	..
PAULIS (ISIRO)	..	560	Workshops for minor repairs.
	Abaku	575	..
	Penge	601	On road Stanleyville–Niangara.
	Nekelagba	612	
	Kasibu	630	..
	Gao	646	..
MUNGBERE	..	685	One hand and one travelling crane.

2. *Komba–Bondo*

Stations	*Halts (with crossing loops)*	*Distance (km.)*	*Remarks*
KOMBA	..	0	The line branches from the Aketi–Mungbere railway and runs north, ascending the Likati river valley.
	Magumbu	19	..
	Sungo	31	..
	Mazambolobo	43	..
LIKATI	..	57	Railway bridge on R. Likati (65 m. or 213 ft.).
	Kulu	80	..
	Nzongia	86	..
	Djete–Mondila	108	..
BONDO	..	122	Post on R. Uele.

6. CHEMIN DE FER DU KIVU (CEFAKI) (Fig. 85)

This short line was begun by the Société des Chemins de Fer du Kivu in 1933 to connect the small port of Uvira, in the north-west corner of Lake Tanganyika, with the fertile country about Lake Kivu. It follows the western side of the valley of the Ruzizi northwards until it encounters the broken mountainous country through which the river falls. The terminus, Kamaniola, is connected by road with the important administrative centre of Costermansville and with Lake Kivu.

DETAILED DESCRIPTION

The gauge of this railway is 3 ft. 6 in. (1·067 m.), and the track length is 58 miles (94 kilometres). The rails are flat-bottomed, 32·8 feet (10 m.) long, weighing 35 lb. per yard (17·5 kg./m.); the sleepers are 5 ft. 3 in. long (1·6 m.) and weigh 41 lb. (18·7 kg.). The maximum permissible axle-load is 9·8 tons. The maximum gradient is 1 in 100 (1%), and the minimum radius of the curves 328 feet (100 m.), but there is one curve of 262 feet.

Bridges

The following is a classification of the known bridges:

No.	*Span (feet)*
21	16–49
3	82
3	131

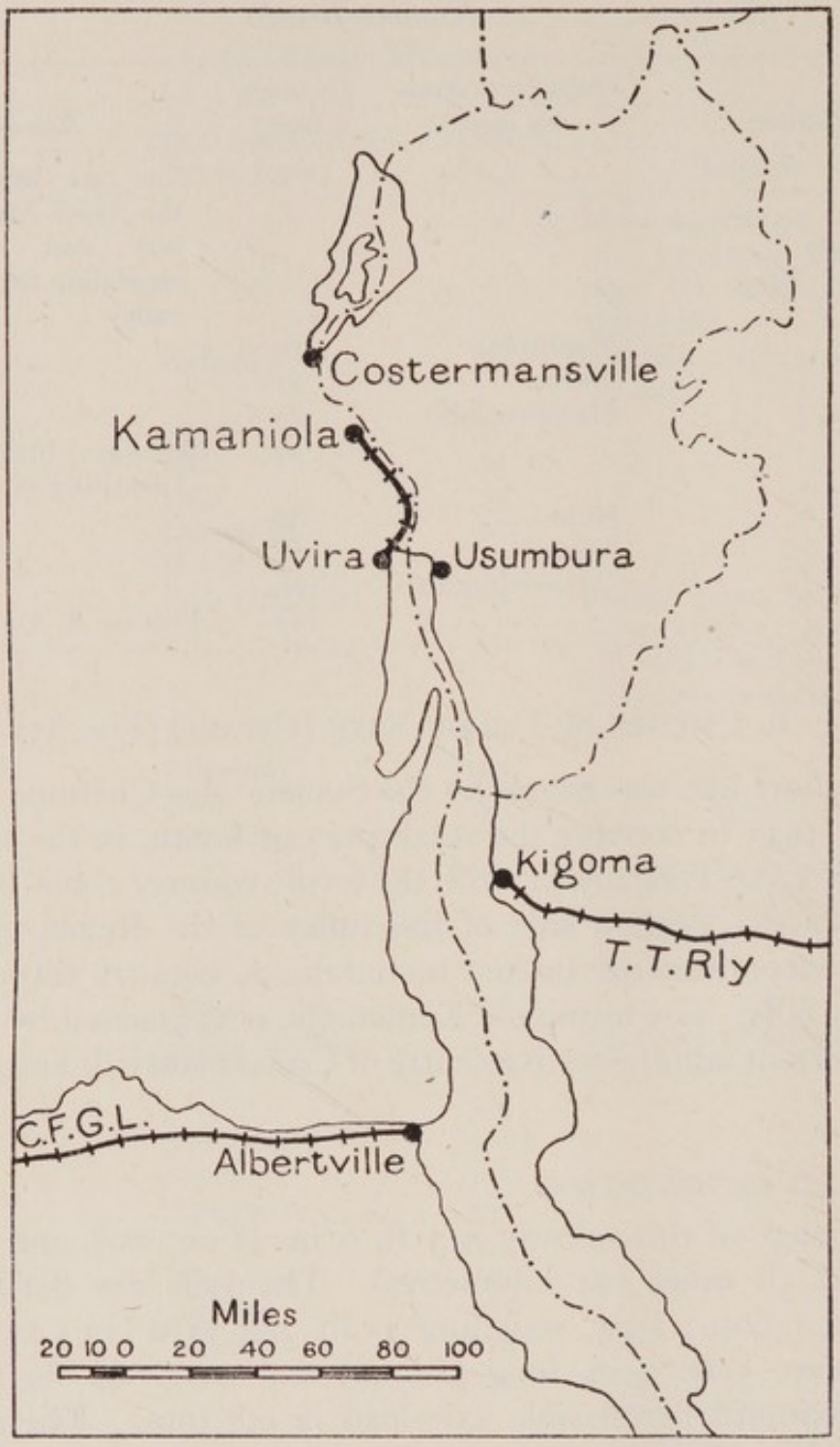


FIG. 85. *Chemin de Fer du Kivu*

Rolling-stock and its Maintenance

In 1942 the following locomotives were in use:

Number	*Wheel arrangement*	*Weight in working order (tons)*	*Tractive force (lb.)*
2	2–8–2	36·4	15,200
4	0–6–0 (shunting)	23·6	7,700

The locomotives are wood-burning. The repair shop is at Kalundu near Uvira.

Coaches and Wagons. In 1939 it was reported that there were 14 passenger coaches in use, but these would be but small carriages.

In 1940 goods wagons were classified as under:

No.	*Type*	*Capacity (tons)*
24	Bogie covered wagons	7·8
2	,, open, high side	11·8
4	2 axled open, high side	8·8
6	2 axled open, high side	7·4
7	Bogie open, low sides	15·7
3	2 axled open, low sides	9·3
4	Cattle wagons	7·8
50		

The loading gauge is: Maximum width 10 feet (3·05 m.) and height above rails 13 ft. 5 in. (4·01 m.).

Staff

10 Europeans and 350 Africans were employed in 1942.

Traffic

The traffic returns for 1942 showed that about 1,500 tons per month were hauled southwards, and from 200 to 300 tons per month northwards. Among the commodities carried were coffee, cotton, wheat, tin ore, and petrol.

ITINERARY

Station	*Distance (km.)*	*Remarks*
UVIRA	0	Height 780 metres (2,559 ft.). Port on L. Tanganyika.
KAVINVIRA	12	..
KILIBA	24	..
SANGHE	46	..
LUBUIVRI	69	..
LUVUNGI	84	..
KAMANIOLA	94	Road connexion to Costermansville and L. Kivu.

7. Private Railways

There were at least four private railways in operation in 1940. The first two are of the most importance.

1. The *Compagnie Géologique et Minière* (Géomines) maintains a line 31 miles long from Mayumba, on the right bank of the Lualaba, eastwards to the cassiterite mines about Manono. The gauge of the railway is approximately 2 feet (0·60 m.). The rails weigh 19 lb. per yard (9·5 kg./m.) and are bolted to steel sleepers weighing 26 lb. (12 kg.) each. The maximum gradient is 1 in 28·7 (3·5%) and the minimum radius of the curves is 164 feet (50 m.). In 1930 the line was operated by 3 locomotives and 10 wagons.

2. The *Société Internationale Forestière et Minière* (Forminière) possesses and operates a line on the upper Kasai. It is 58 miles long and has been constructed to by-pass the Wissmann rapids. The Kasai is navigable to Charlesville, which is the northern terminus of the railway, the southern terminus being at Makumbi, also on the Kasai. The gauge of this railway also is approximately 2 feet (0·60 m.). Flat-bottomed rails, weighing 18 lb. per yard (9 kg./m.), are used and steel sleepers weighing 26 lb. (12 kg.). The maximum gradient is 1 in 33·3 (3%), and the minimum radius of the curves is 98 feet (30 m.). In 1930, 9 wood-burning locomotives and 37 wagons were in use.

3. *Cultures au Congo Belge* operate a light railway about 18 miles long from Mongana, on the south bank of the Congo river opposite Lisala, to Bodala, but this is little more than a plantation railway.

4. Similarly the H.C.B. maintain a light plantation railway at Alberta on the north bank of the Congo, near Bumba. This line was constructed to bring in palm-nuts to the factories. It extends for about 20 miles.

ROADS

Roads in the Belgian Congo, as in other tropical colonies, are only in the initial stages of development. The first broad roads were engineered within the memory of men still living. On the other hand trackways, over which passed an intermittent traffic of foot passengers and porters carrying their loads, have been in existence for centuries on the highlands to the north and south of the Congo basin. Lower down the slopes, within the dense forests which cover the basin, roads were superfluous, and the many rivers and streams

provided the means of communication, as they do to-day. Obviously a dugout canoe is the most natural form of transport.

The old trackways, or caravan routes, were little more than broad foot-paths, for nothing more elaborate was necessary to enable travellers to pass on their way in single file. It is a noticeable trait of Africans that they still continue to walk in single file along the broad new highways, or, indeed, up the main streets of the new towns.

In some places an old track might be broad, but in bush-covered country, where the labour of clearing is great, it was generally narrow. There was no road authority other than a chief to order the clearing, or the maintenance, of roads, and a chief's authority was limited to the confines of a few villages. Usually the tracks ran direct from camp to camp, or village to village, yet hardly 5 yards of their length were in a straight line. If a tree fell across the way nobody dreamed of moving it. It was far easier to go round the obstruction. A wild animal's burrow, or the growth of an ant-hill, would divert a small part of the track, while the rumour that a herd of elephants, or a pride of lions, was in the neighbourhood would cause a considerable diversion. The removal of a village, or its destruction by slave-raiders, a common enough event, would put large sections out of use. Natives speak of a track 'dying', or as being already 'dead'. As mentioned above, ancient, possibly very ancient, trackways followed the watershed of the Congo and the Zambezi, but over much of their length it is impossible to follow their exact trace, which swerved with the accidents of the day. That the track or road of yesterday is lost in bush to-morrow is the common discovery of those who travel in Africa, and old maps are dangerous guides to ways of communication.

Early Roads

In 1880–1881 H. M. Stanley cleared a track, 15 feet wide, from Vivi (just above Matadi) to Isangila, and from Manyanga, some distance farther up the river, to Stanley Pool. Over this he man-hauled wagons carrying the machinery for two steamboats which were eventually used on the upper Congo. His was the first road-making enterprise on a large scale in the country. Later '*the* caravan road' (the definite article was accentuated) was opened between Matadi and Stanley Pool and was in use over the whole, or part, of its length until the Congo railway was completed in July 1898. The new road was a great improvement on early tracks, as Plate 89 shows.

It was more carefully alined, bridges were constructed over streams, ferries were maintained over broad rivers, and rest-houses or camps were built at intervals. Over this road all goods needed for the development of the country were man-hauled on wagons or carried on men's heads. An average porter's load was 45 lb. The journey from Matadi to Stanley Pool took anything from three weeks to three months. Several steamers which eventually plied on the upper Congo were transported in porter loads over the caravan road, besides the small craft which Stanley transported to the Pool.

Roads for other purposes were also constructed or cleared. A track, along which ran a telegraph line, was cut from Leopoldville to Coquilhatville, but it was little used for transport purposes. In the north-east the discovery of gold called into being other tracks. A type of steam tractor was used on them, but it was not a great success. More roads were made as other minerals were discovered or other enterprises were developed. Mechanical transport of any kind was rarely used, whilst animal transport was usually out of the question owing to the ever-present tsetse-fly.

However, experience in the War of 1914–1919 in East Africa proved that petrol-driven cars and lorries could operate in the African bush. Cars and lorries began to appear on the existing roads, which were improved to carry them, and other roads were opened, particularly in the regions now known as the Stanleyville and Lusambo provinces.

Classification of Roads

The Government of Belgian Congo has divided the roads of the colony into three classes:

A. *Routes d'intérêt général*
B. *Routes d'intérêt local*
C. *Routes privées*

The first two classes are public roads and are maintained by the government *Service des Travaux*. To the third class belong accommodation roads to mines, plantations, or estates, and such roads are maintained by private enterprise.

It is easier to define the second class than the first. Routes d'intérêt local are usually the tracks which have been cut from village to village and are of more concern to the administrative sub-district than to the public at large.

Routes d'intérêt général are mostly through roads and are

subdivided into three types: (*a*) Principal Roads (*Routes principales*); (*b*) Secondary Roads (*Routes secondaires*); and Minor Roads (*Voyageurs*), which are chiefly used by pedestrians.

The latest available returns show the mileage of the various classes and types to be:

	Mileage	
Class A. Routes d'intérêt général		
(*a*) Principal	3,160	
(*b*) Secondary	4,820	
(*c*) Minor	1,340	
		9,320
Class B. Routes d'intérêt local		26,500
Total Public Roads		35,820
Class C. Routes privées		6,520
Grand Total		42,340

The average cost of maintaining Class A roads in 1938 was:

Principal Roads	£5. 12*s*. 0*d*. per mile.
Secondary Roads	£4. 15*s*. 0*d*. ,, ,,
Minor Roads	£3. 12*s*. 0*d*. ,, ,,

Of these costs 12 per cent. was absorbed by the European staff, 60 per cent. by native labour, and 28 per cent. by the purchase of materials.

Construction of Roads of all Types

Road location in highly developed countries has to take into account property rights, the preservation of amenities, and the convenience of long-established settlement. These considerations have little weight in tropical Africa. For practical reasons it is usually the aim of the road engineer to site a new road along the ridge of a watershed, or to cross a river at some convenient point, and he often has a wide field of choice.

It will be seen that the rates of upkeep, not far different from those allowed in other African colonies, do not permit the metalling or surface-dressing of roads of any class or category. Only in a few of the towns are there concrete roads; the surface of the country roads is that of the natural earth over which they pass. Earth roads, therefore, are common, but they are not to be despised for that reason. A car with plenty of power and high clearance can travel

far and wide over the surface of these roads. Low-powered cars, with little clearance, are of little use except in and about towns.

Apart from location and drainage, which are relatively more important than in the higher type of construction, the success of earth as a surface material depends largely on climatic conditions and especially on adequate maintenance organization. During rain or under heavy traffic the surface deteriorates rapidly. Standing water evaporating slowly in well-shaded stretches through forests softens the road, which becomes covered with wheel ruts. Ruts first slow up the traffic and then disrupt it unless the road is kept under constant repair. Modern road-maintenance machinery—road-graders, bull-dozers, and the like—has not been extensively used in the past. Natives armed with baskets or pans for carrying earth, shovels, hoes, and rammers have carried out the work of construction. Native tax defaulters are employed on maintenance. Hence, because of the climate which varies from area to area, and the adequacy or inadequacy of the maintenance arrangements, roads are not of the same degree of permanence throughout. There are seasonal and all-weather roads, which are surfaced with laterite, limonite, or sometimes with crushed termite-heap earth. Where a road crosses a rocky formation the surface is, of course, hard and resistant, but a surface of laterite cannot be compared with one of crushed granite or trap rock. In dry weather the surface of these roads is apt to corrugate or pack into ridges under the impact of heavy lorry traffic. One gets the impression of driving over a disused railway track from which the sleepers have been removed.

Bridges and Ferries

In a country so magnificently watered as the Belgian Congo culverts, bridges, and ferries occur with embarrassing frequency. There are several types of bridges. They may be constructed of timber felled on the site, and the decking may be of saplings covered with earth, whilst at the other end of the scale there are reinforced concrete, or steel lattice girder, bridges of long span. On the most important roads permanent structures are replacing the primitive bush bridges. Even the so-called permanent bridges may belie their name, however, for forest streams in spate may discharge enormous volumes of water. A sudden and violent flood may wash out the abutments or upset the whole structure. In the savanna country bush fires frequently destroy the wooden bridges. An enterprising motorist who has overcome the difficulties of a soft

road may well find further progress barred by a stream which was once spanned by a bridge.

Ferries are common as being cheaper to install than long span bridges, but they delay traffic, for it may take anything up to an hour and a half to be ferried over one stream. There are various types of which the most primitive, and probably the most common, is made of dug-out canoes. Four or more of them are arranged parallel to one another, and across them stout beams are laid and secured. The beams are decked or else provided with running boards over which a vehicle may pass. Some sort of ramp is provided either on shore or on the ferry itself. Generally speaking, the ferry is either hauled or paddled across the river, but is sometimes towed by a power launch. There are more elaborate arrangements in use on some of the rivers, such as steel pontoons or specially built vessels. As an example of the number of ferries liable to be met it may be mentioned that there were, at the beginning of the war, three between Lisala and Bangui (375 miles) and three between Bumba and Aketi (125 miles). The delays likely to be caused by ferries should always be taken into account in planning a journey.

Petrol

Another important factor in planning a journey is the supply of petrol. In normal times one can hardly expect to find a petrol pump in a native village; in fact outside the great towns they do not exist. Petrol may usually be bought in a wooden case which contains two tins. The tins are not of the screw cap variety known in Europe, but are of light material, sealed, and are opened by knocking a hole in the top. Case petrol is sold at the stores in the trading centres and administrative posts. It is always advisable to carry a spare case on the car or lorry when travelling any distance. So too oil and grease should be carried, for motor vehicles require more lubrication on earth than on tarmac roads.

Through Roads

Those here described as 'through roads' are not all in Class A (Primary Roads), neither are all Class A through roads. Many stretches may be in Class B. In 1942–1943 the most important through roads were:

(1) Leopoldville–Lufu (173 miles) and extensions. This road is a part—and the greater part—of a road linking Leopoldville with

Matadi, Boma, and Banana. Some recent reports seem to indicate that it is even now possible to motor from Leopoldville to Matadi and beyond. After crossing to the north bank of the river at Matadi a road strikes north and then south-west to Boma, and continues to Banana and Cabinda.

(2) Lisala–Libenge via Budjala (275 miles). This road connects the Congo river with Libenge on the Ubangi. Libenge is a port of departure for French Equatorial Africa, and from it road communication leads as far as the Cameroons. There is also a dry-weather road from Lisala to Libenge, via Likimi and Gemena (325 miles).

(3) Libenge–Banzyville–Monga (360 miles).

(4) Near Komba on the Aketi–Buta road (No. 6) to Bondo and Bangassou (205 miles).

(5) Lisala–Bumba (100 miles). This is but a link in the chain of roads which connects west and east Africa. *Vide* (6).

(6) The *Route Royale* (approx. 690 miles) from Bumba to the Sudan border. This is one of the most important roads in the Congo and is said, locally, to be the best road in tropical Africa, although there are other claimants to this honour. However, stretches of this road have a laterite surface and high speeds have been attained on it. It has been much improved in recent years and a great deal of attention has been paid to bridges.

The Route Royale is usually divided into four sections:

(*a*) Bumba–Aketi (Port Chaltin) on the Itimbiri river (125 miles).

(*b*) Aketi–Buta (78 miles).

(*c*) Buta–Faradje (445 miles).

(*d*) Faradje–Frontier (Libogo) (43 miles).

Buta and Faradje are road junctions.

(7) Stanleyville–Buta, via Banalia (210 miles).

(8) Stanleyville–Faradje (about 500 miles). This road is also divided into sections:

(*a*) Stanleyville–Nia-Nia (210 miles).

(*b*) Nia-Nia–Wamba–Watsa–Faradje (320 miles).

(9) Nia-Nia–Irumu–Kasenyi (about 250 miles).

(10) Wamba–Makilimbo (110 miles).

(11) Watsa–Irumu (253 miles).

(12) Doko–Aru (110 miles).

(13) Irumu–Beni–Rutshuru (about 283 miles).
(14) Beni–Kasindi–Frontier (45 miles)–Mbarara (Uganda).
(15) Rutshuru–Costermansville (180 miles).
(16) Rutshuru–Frontier (17 miles)–Mbarara.
(17) Costermansville–Itula (165 miles).
(18) Costermansville–Uvira–Usumbura–Kitega (160 miles).
(19) Usumbura–Astrida–Kigali–Frontier (220 miles).
(20) Kitega–Astrida (75 miles).
(21) Itula–Kongolo (330 miles).
(22) Kongolo–Kabongo (235 miles).
(23) Kabongo–Bukama (180 miles).
(24) Bukama–Elisabethville (296 miles).
(25) Elisabethville–Ndola (N. Rhodesia) (165 miles).

Roads 15, 17, 21–25 form a continuous link with the roads in the Rhodesias and South Africa.

(26) Elisabethville–Minga–Kasenga (140 miles).
(27) Minga–Pweto (150 miles).
(28) Bukama–Luluabourg–Mweka–Port Francqui (690 miles).
(29) Tenke–Eastern frontier of Angola at Dilolo Gare (210 miles).
(30) Kisantu–Masi Manimba–Kikwit–Mangai (550 miles).
(31) Mangai–Port Francqui (95 miles).
(32) Mweka–Bulungu (110 miles).
(33) Luluabourg–Tshikapa–Frontier (210 miles).
(34) Basankusu–Boende (180 miles).

These roads, and some of less importance, are all shown on the map of communications which accompanies this volume. A glance at the map will show that, for the most part, they avoid the Congo plain in which the natural lines of communication are the rivers.

Other Roads

The mileage of roads in the list given above is nearly equal to the total of the principal and secondary subdivisions of Class A. The minor roads of this class are not very important, but the roads of Class B (*Routes d'intérêt local*), of which there are over 26,000 miles, are important. Each province has its quota and, logically enough, roads tend to keep pace with industrial and agricultural

development; thus the most advanced provinces have the best developed systems.

	Miles of Class B roads
Leopoldville	5,577
Coquilhatville	2,028
Stanleyville	6,202
Costermansville	1,289
Elisabethville	4,337
Lusambo	7,067

It would be futile to attempt to describe these roads in detail for the reasons already given. None are necessarily permanent. They may be serviceable one year and overgrown the next, and probably every edition of a map of the country tells a different story. The only safe method of arriving at a conclusion is to consult the local authorities. The roads in question, at any rate the greater number of them, are capable of carrying a normal service of mechanical transport during the dry season, whilst some are capable of carrying a limited amount during the wet. In Stanleyville province they are liable to be cut up by the transport of the cotton crop to the ginneries, and by traffic to and from gold mines. In Lusambo province the transport of the cotton crop is also heavy.

AIRWAYS

WHEN the misfortune of war overtakes a country the roads, railways, and waterways may gain, or lose, in significance, but will not change much in position. Airways, on the contrary, are permanent only in ground installations—in the airfields and landing-grounds—and even those can be rapidly extemporized. The present-day air activity of the Belgian Congo is wholly devoted to prosecuting the war. It follows neither the pattern of the past nor the obvious needs of a future economy, and no useful purpose could be served by describing present activities even if the information were available.

The Belgian Government can claim the credit of instituting the first regular air service in Africa. In June 1919 a *Comité d'Études pour la Navigation Aérienne* (Senac) was appointed in order to study the question of the development of air transport in the Belgian Congo. A second society, the Sneta (*Société Nationale pour l'Étude des Transports Aériens*), undertook to establish an air service between Leopoldville and Stanleyville, and their first aeroplane was in com-

mission in 1920. In 1923 these arrangements came to an end, and the Sabena (*Société Anonyme Belge d'Exploitation de la Navigation Aérienne*) was formed by the joint efforts of the Belgian Government, the colony itself, and Sneta. The task of the new organization was to regularize both the service from the mother country to the Congo, and that within the borders of the latter. To this end Sabena established a mail service which flew alternately with a French line, the *Régie Air Afrique*. Up to 1939 Sabena maintained a weekly air service from Brussels to Bangui (on the Ubangi river), and from thence, via Libenge, Bumba (on the Congo), Stanleyville, Kindu (on the Lualaba), Kabalo, Manono, and Bukama to Elisabethville. The *Régie Air Afrique* also flew over nearly the same route to Bangui and Elisabethville. It continued to Broken Hill in Northern Rhodesia and Antananarivo in Madagascar. There was yet another possible air link with Europe. The aeroplanes of Imperial Airways passed through Port Bell, on Lake Victoria, on their flights between England and Capetown.

In the interior of the colony Sabena also maintained an excellent service which connected the capital with the trunk route from Europe, and the most important towns with the capital. A weekly aeroplane flew from Libenge, which will be remembered as the point of entry from Europe, to Coquilhatville and Leopoldville. There was a weekly service from Leopoldville to Lusambo on the Kasai, via Banningville, Port Francqui, Luebo, and Luluabourg. A fortnightly service was maintained between Leopoldville and Boma, and another nearly followed the course of the Congo river from Stanleyville, via Basoko, Bumba, Lisala, Basankusu, Coquilhatville, Inongo, and Banningville to Leopoldville.

Principal landing-grounds or airfields (*plaines d'escale principale*) were made at important places, and emergency landing-grounds (*terrains de secours*) were cleared at intervals of 20 or 30 miles along the lines of flight between principal landing-grounds. The principal landing-grounds still exist and it is not unlikely that more have been constructed. The same trouble has probably not been taken with the maintenance of emergency landing-grounds. Some may have become overgrown, for most of them were carved out of virgin forest. Moreover, it is important to note that they were designed for the type of aeroplane in use some twenty years ago and may not be suitable for modern heavy high-speed machines.

The following is a list of the airfields and emergency landing-grounds which existed about 1939.

Line	*Airfield*	*No. of emergency landing-grounds between airfields*
Boma–Leopoldville	Boma	
		1
	Matadi	
		5
	Thysville	
		4
	Leopoldville	
Leopoldville–Banningville	Leopoldville	
		8
	Banningville	
Banningville–Coquilhatville	Banningville	
		5
	Inongo	
		7
	Coquilhatville	
Coquilhatville–Lisala	Coquilhatville	
		10
	Basankusu	
		6
	Lisala	
Lisala–Stanleyville	Lisala	
		3
	Bumba	
		7
	Basoko	
		7
	Stanleyville	
Coquilhatville–Libenge	Coquilhatville	
		3
	Buburu	
		4
	Libenge	
Libenge–Lisala	Libenge	
		3
	Lisala (or Bumba)	
Stanleyville–Bukama	Stanleyville	
		2
	Lowa	
		1
	Kindu	
		4
	Kabalo	
		1
	Manono	
		3
	Bukama	

Line	*Airfield*	*No. of emergency landing-grounds between airfields*
Bukama–Elisabethville		
	Bukama	
	. . . . .	1
	Ngule	
	. . . . .	2
	Elisabethville	
Leopoldville–Luebo		
	Leopoldville	
	. . . . .	5
	Masi-Manimba	
	. . . . .	1
	Kikwit	
	. . . . .	3
	Tshikapa	
	. . . . .	3
	Luebo	
Luebo–Luluabourg		
	Luebo	
	. . . . .	4
	Luluabourg	
Luluabourg–Lusambo		
	Luluabourg	
	. . . . .	6
	Lusambo	
Luluabourg–Bukama		
	Luluabourg	
	. . . . .	2
	Luputa	
	. . . . .	2
	Kamina	
	. . . . .	0
	Bukama	
Banningville–Luebo		
	Banningville	
	. . . . .	8
	Port Francqui	
	. . . . .	4
	Luebo	
Stanleyville–Irumu		
	No particulars	
Irumu–Usumbura		
	Irumu	
	. . . . .	1
	Beni	
	. . . . .	3
	Goma	
	. . . . .	1
	Shangugu	
	. . . . .	1
	Usumbura	

As can well be imagined, events in Europe speedily upset all the arrangements of 1939. The Régie Air Afrique ceased to operate, and the Sabena could no longer connect with Antwerp. The British Imperial Airways also disappeared and gave place to the British Overseas Airways Corporation (B.O.A.C.) which opened up trunk routes from and to Belgian Congo.

In June 1943 the B.O.A.C. maintained the following services:

1. Egypt, Belgian Congo, West Africa; with flying-boats.
2. Egypt, Belgian Congo, West Africa; aeroplane service by Sabena, under charter to the B.O.A.C.
3. Sudan, Belgian Congo, West Africa; aeroplane service by Sabena, under charter to the B.O.A.C.
4. Lagos, Libreville, Pointe Noire, Leopoldville; aeroplane service by Sabena under charter to the B.O.A.C.

At the same time Sabena maintained a fortnightly service between Elisabethville and Capetown, via Ndola (southbound only), Lusaka (northbound only), Bulawayo, and Johannesburg.

The following local routes were also operated by Sabena:

From Leopoldville

Weekly services:

1. Leopoldville–Kikwit–Tshikapa–Luluabourg.
2. Leopoldville–Banningville–Inongo–Coquilhatville–Libenge–Lisala–Bumba–Basoko–Stanleyville.

Fortnightly services:

3. Leopoldville–Coquilhatville–Bumba–Stanleyville.
4. Leopoldville–Kikwit–Luluabourg–Bukama–Elisabethville.

From Stanleyville

Fortnightly services:

5. Stanleyville – Irumu – Goma – Costermansville – Usumbura–Kindu–Kasongo–Kabalo–Manono–Elisabethville.

Besides all this, at the end of 1941, a Clipper service between the United States and the Congo was inaugurated. The line connects with the other airlines to the Sudan and to the Cape.

Belgian airmen, aeroplanes, and airways have had much to do in war, and have proved their value time and again. This is, however, not the place in which to record their doings.

SIGNAL COMMUNICATIONS
(Fig. 86)

As is natural in so new and vast a country, signal communications are not yet organized on any extensive scale. The forest, with its dependence upon waterways and lack of cleared roads, is the most

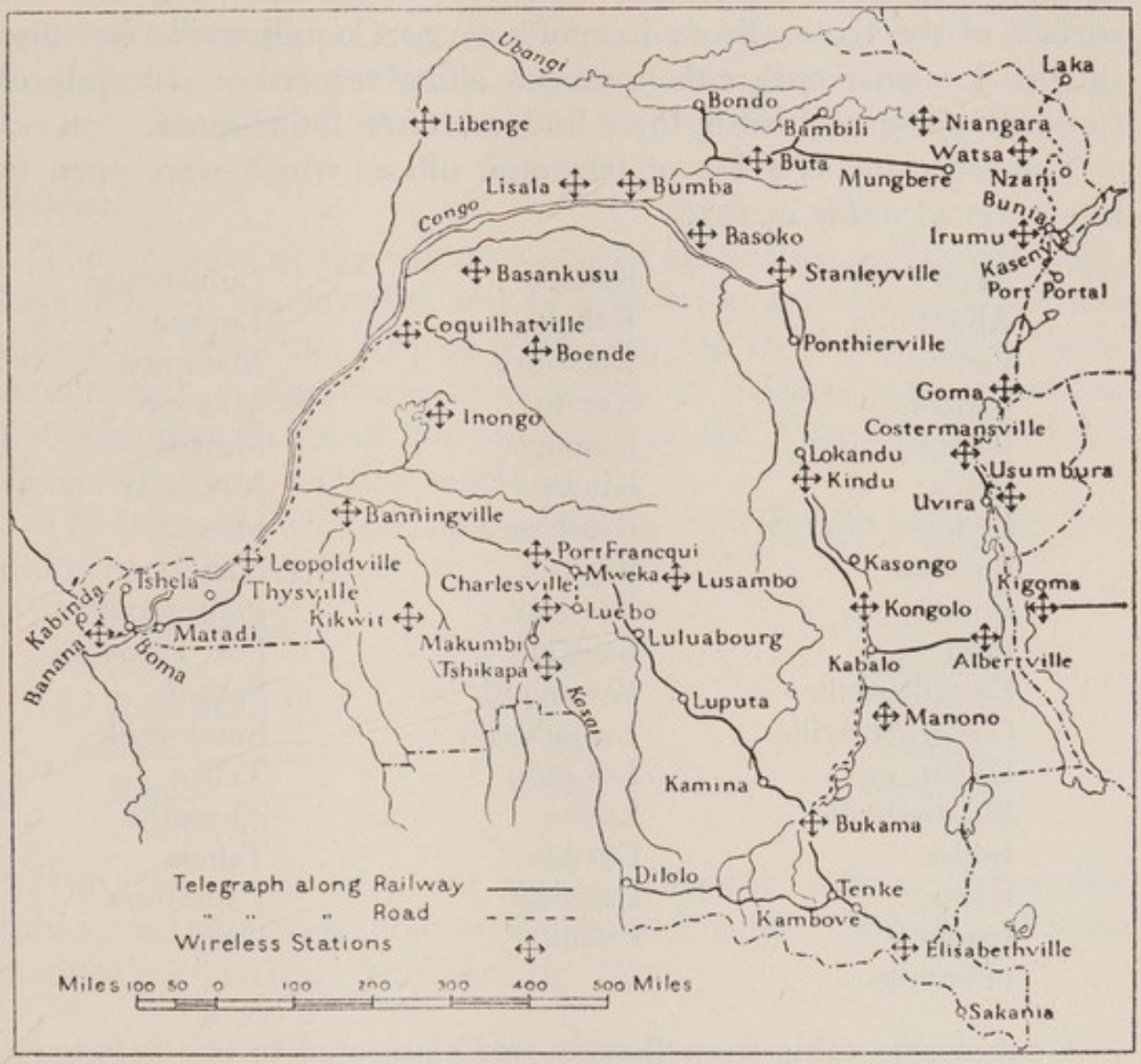


FIG. 86. *Signal Communications*

formidable obstacle to overcome. Wireless has been freely installed to supplement the scanty telegraph service. The same difficulty of keeping lines in action through the forest has meant that the telephone service is not greatly developed. There are numerous local systems, but long-distance communication is seldom available. It is difficult to obtain exact information in detail. Broadly speaking there were, in 1939, 134 post offices, 78 telegraph offices, 23 telephone exchanges with a total of 1,882 subscribers, and 30 wireless stations.

Telegraph Lines and Submarine Cables

The only overhead telegraph line service of which constructional details are known is that between Matadi and Boma. Here the line is carried on steel poles, 22 feet high, at intervals of 110 yards. This line crosses the river where it is 500 yards wide, just below Matadi, and is supported by two pylons which are built high enough up the steep hill-sides to allow 130 feet between the wire and the surface of the river. From Leopoldville to Coquilhatville and also up the Lualaba, telegraph lines run along the rivers. In spite of frequent clearing of bush, these lines are often interrupted.

The following is a list of telegraph offices which were open to international traffic in 1939:

Aketi
Albertville
Bambili
Banana
Bolobo
Boma
Bondo
Bukama
Bunia
Buta
Coquilhatville
Costermansville
Dilolo
Elisabethville
Inkisi
Irebu
Irumu
Jadotville
Kaballa
Kabalo
Kambove
Kamina
Kasongo
Kindu
Kinshasa
Kipushi
Kolwezi
Kongolo
Kwamouth
Leopoldville
Lokandu
Luebo
Luishia
Lukolela
Lukulu
Luluabourg
Luputa
Madimba
Manono
Matadi
Moerbeke
Mweka
Nizi
Ponthierville
Port Francqui
Sakania
Stanleyville
Tenke
Thysville
Tshela
Usumbura
Uvira

A submarine cable from Banana was connected to one belonging to the Eastern Telegraph Company (now Cables and Wireless Ltd.) running between San Thomé and Loanda (Angola). This line was cut in 1940.

Telephones

Trunk Lines. There are trunk lines in operation between Matadi, Leopoldville, and Brazzaville; Matadi, Boma, and Noqui in Angola; Banana and Cabinda; Stanleyville and Ponthierville; Elisabethville and Jadotville.

It is almost certain that trunk services exist along the following routes:

1. Banana – Boma – Matadi – Thysville – Leopoldville – Kwamouth – Bolobo–Lukolela–Coquilhatville.
2. Boma–Lukula.
3. Kongolo–Kabalo–Albertville.
4. Sakania–Bukama–Port Francqui.

Local Exchanges. There are local exchanges at Banana, Boma, Coquilhatville, Elisabethville, Irumu, Jadotville, Kindu, Kongolo, Leopoldville, Matadi, Ponthierville, Stanleyville, and Thysville.

Wireless

The majority of the wireless stations are for local purposes only. Leopoldville, Stanleyville, and Elisabethville are the main stations for service with other African territories. On 16 May 1943 a wireless station with a short-wave transmission to Belgium was opened at Leopoldville. Some of the steamers on the Congo and on Lake Tanganyika have wireless telephones.

The following wireless stations, not on the telegraph lines, are open to international traffic:

Banningville	Goma	Lisala
Basoko	Inongo	Lusambo
Basankusu	Irumu	Niangara
Boende	Kikwit	Tshikapa
Bumba	Libenge	Watsa
Charlesville		

Telegraph and telephone lines, telegraph offices, submarine cables, and wireless stations are shown on Fig. 86. Details of wireless stations are given in the following table.

Wireless Stations

Name of station	*Position (approx.)*	*Wave-length: long, medium, or short*	*Power in kW. (if known)*	*Remarks*
ALBERTVILLE	5° 56′ S. 29° 13′ E.	4 short	0·2 0·1	Commercial station. Service to Kigoma in Tanganyika and interior day service.
BANANA	6° 01′ S. 12° 27′ E.	4 medium 4 short	0·5	Coast and also commercial station with service to Pointe Noire (French Equatorial Africa), Cabinda, and to the interior.

Name of station	*Position (approx.)*	*Wave-length: long, medium, or short*	*Power in kW. (if known)*	*Remarks*
BANNINGVILLE	3° 19′ S. 17° 21′ E.	4 short	0·1	Commercial station. Interior day service.
BASANKUSU	1° 10′ N. 19° 40′ E.	5 short	0·1	Commercial station. Interior day service.
BASOKO	1° 15′ N. 23° 40′ E.	4 short	0·1	Commercial station. Interior day service.
BOENDE	0° 13′ S. 20° 50′ E.	4 short	0·1	Commercial station. Interior day service.
BUKAMA	9° 10′ S. 25° 50′ E.	4 short	0·12	Commercial station. Interior day service.
BUMBA	2° 10′ N. 22° 31′ E.	4 short	0·1	Commercial station. Interior day service.
BUTA	2° 47′ N. 24° 45′ E.	5 short	0·1	Commercial station. Interior day service.
CHARLESVILLE	5° 32′ S. 20° 57′ E.	1 short	0·05	Commercial station. Interior day service.
COQUILHATVILLE	0° 04′ N. 18° 20′ E.	12 short	2 0·7 0·5 0·1 and one unknown	Commercial station. Fixed service to Bangui (French Equatorial Africa) and interior day service. Meteorological reports.
COSTERMANSVILLE	2° 30′ S. 28° 50′ E.	4 short	0·1	Commercial station. Interior day service.
ELISABETHVILLE	11° 42′ S. 27° 32′ E.	11 short	0·7 0·5 0·1	Commercial station. Fixed service to Leopoldville and interior day service. Meteorological reports.
GOMA	1° 40′ S. 29° 08′ E.	2 short	0·05	Commercial station. Interior day service.
INONGO	1° 55′ S. 18° 30′ E.	4 short	0·1	Commercial station. Interior day service.
IRUMU	1° 30′ N. 29° 55′ E.	4 short	0·1	Commercial station. Interior day service.
KIKWIT	5° 20′ S. 18° 54′ E.	4 short	0·1	Commercial station. Interior day service.
KINDU	2° 59′ S. 25° 56′ E.	4 short	0·1	Commercial station. Interior day service.
KONGOLO	5° 22′ S. 27° 00′ E.	4 short	0·1	Commercial station. Interior day service.
LEOPOLDVILLE	4° 20′ S. 15° 21′ E.	26 short	15 9 2 1 0·1 0·05	Commercial and broadcasting stations. Fixed service with Elisabethville and Stanleyville. Interior day service. Local broadcasting by day on 0·05 kW., and possibly also on greater power. Meteorological reports.
LIBENGE	3° 39′ N. 18° 39′ E.	4 short	0·1	Commercial station. Interior day service.

Name of station	*Position (approx.)*	*Wave-length: long, medium, or short*	*Power in kW. (if known)*	*Remarks*
LISALA	2° 09′ N. 21° 35′ E.	4 short	0·1	Commercial station. Interior day service.
LUSAMBO	4° 59′ S. 23° 23′ E.	4 short	0·1	Commercial station. Interior day service.
MANONO	7° 10′ S. 27° 16′ E.	4 short	0·1	Commercial station. Interior day service.
NIANGARA	3° 35′ N. 27° 59′ E.	4 short	0·1	Commercial station. Interior day service.
PORT FRANCQUI	4° 19′ S. 20° 37′ E.	4 short	0·1	Commercial station. Interior day service.
STANLEYVILLE	0° 32′ N. 25° 13′ E.	19 short	2 0·1	Commercial station. Fixed service with Leopoldville and Beyrouth (Syria). Interior day service. Meteorological reports.
TSHIKAPA	6° 28′ S. 20° 46′ E.	4 short	0·05	Commercial station. Interior day service.
USUMBURA	3° 23′ S. 29° 21′ E.	4 short	0·1	Commercial station. Fixed service with Kigoma (Tanganyika) and interior day service.
WATSA	3° 02′ N. 29° 30′ E.	4 short	0·1	Commercial station. Interior day service.

Note. At Kigoma (approx. 4° 50′ S., 29° 36′ E.), in Tanganyika territory, a wireless station has been allotted to the Belgians. This station is in touch with Albertville and Usumbura (see remarks on those places).

Wireless stations have been shown in the *Annuaire du Congo Belge* at Aketi and Boma as far back as 1929, but they are not confirmed as working at present, and are therefore omitted.

CHAPTER XVI

MAPS AND AUTHORITIES

INCLUDING, as it does, so much of the rain forest of Equatorial Africa, the Belgian Congo offers exceptional difficulties to surveying and mapping. Yet much has been done, especially on the surrounding highlands and watersheds where better visibility has made triangulation and plane-tabling possible.

It is proper to begin with the quite exceptional river surveys of that missionary, explorer, and map-maker Grenfell. Several of his surveys (Figs. 7 to 11) are reproduced in this book, and they are no mere sketches. His 'running surveys', carried out from river steamboats, were governed by observed latitudes and times—the latter compared with ships' chronometers—and included cross-bearings by the hundred thousand. His astronomical framework was observed with a transit theodolite, and his bearings and angles measured with an azimuth compass or with a sextant. Perhaps, in his Cornish youth, he learnt navigation practically, but there is no record of any adult course of instruction and probably he studied the subject from books, and then practised till he was expert.

River traverses were carried forward by many officials and explorers. Before the end of last century many points were fixed astronomically, the time and chronometer longitudes being checked by culminations of the moon. Heights were mainly barometric. Errors due to this class of surveying amount to two or three seconds of arc in latitude, a minute of longitude, and 100 feet in height, and are characteristic, still, of mapping within the forest belt.

A glance at Fig. 41 will show how the boundaries of the Belgian Congo have been delimited and demarcated by numerous boundary commissions, mainly during the present century. Thus, all the boundaries between Belgian and British territories, except that between the Anglo-Egyptian Sudan and the Haut-Uele, have been well triangulated and mapped, and all of them are connected to that arc of triangulation, on the 30th meridian, from Capetown, destined, one day, to reach Cairo. The large area of triangulation in Katanga is connected directly to that in Ruanda-Urundi by a chain observed along the western mountain wall of the Rift valley. A spur from these boundary surveys reaches the Kilo-Moto minefield.



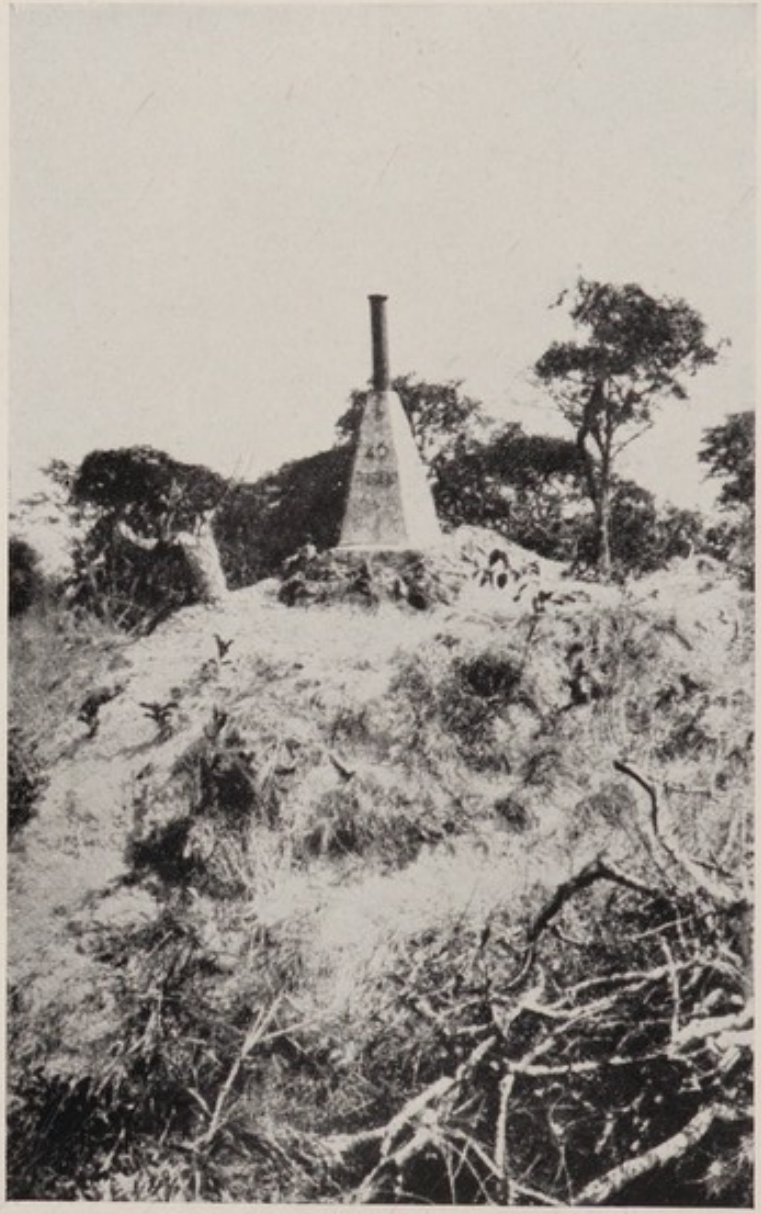
102. *Boundary survey. Line cleared in forest*



103. *Boundary survey. Line cleared on plain*



104. *Setting up a boundary pillar*



105. *A boundary pillar*

The Belgian–Portuguese boundary, south of the gateway (Fig. 2) and continuing south and east till it reaches the Congo–Zambezi watershed, was also well surveyed.

It was not until many of the boundaries were demarcated that any large areas were tackled within the Belgian Congo itself. The first to be taken up seriously—Katanga—was begun in 1920; the second—the Bas-Congo—in 1924. The Katanga triangulation, coming from the 30th arc of meridian, and embodying the work of two Anglo-Belgian boundary commissions, covers a large area but not all of Katanga. Three bases govern the lengths. In the Bas-Congo there is a similar area of triangulation, with three main chains and a similar number of bases. In these two areas good mapping has been done.

Of Katanga three map portfolios have been produced as the 'Atlas du Katanga' and cover, in all, eight degree sheets at the scale of 1/200,000, with topographical, geological, and vegetational editions. One or two good town plans and many good photographs are included in these portfolios.

The Bas-Congo is a more difficult area, but is well mapped in eight topographical sheets at the scale of 1/100,000. This surveyed area now reaches as far east as the mouth of the Kasai.

So far there is no good mapping of the rich and comparatively open areas of the north-east Haut-Uele.

A very important addition to the mapping of the Belgian Congo has recently been made and takes the form of twelve newly drawn sheets of the International 1/M. The preparation of these sheets, which were fair-drawn and printed in Johannesburg, is much to the credit of a reduced war staff. This is the most authoritative series covering the whole area. The derivative 1/2M is complete, but less up to date than the local 1/Ms, and there are not only the normal sheets shown in Fig. 87, but also another Belgian series at the same scale, and in different sheetlines.

General maps, covering the whole area, include one at the scale of 1/4,000,000 published by G.S.G.S., and the map at the same scale which is to be found in the end pocket of this volume. This map is one of a series, issued by Bartholomew, and covering Africa. Place-names have been spelt, normally, as given on this sheet. There is a 1/5,000,000 of central and south Africa published by G.S.G.S., and another published by the Congo authorities at that same scale giving a very clear picture of the administrative areas and boundaries. A special map at 1/500,000—'Territoires du Ruanda-Urundi'—

published by the Ministère des Colonies in 1938, gives a clear and useful picture of that mandated area.

Of all these maps the most generally useful are the 1/M and 1/2M.

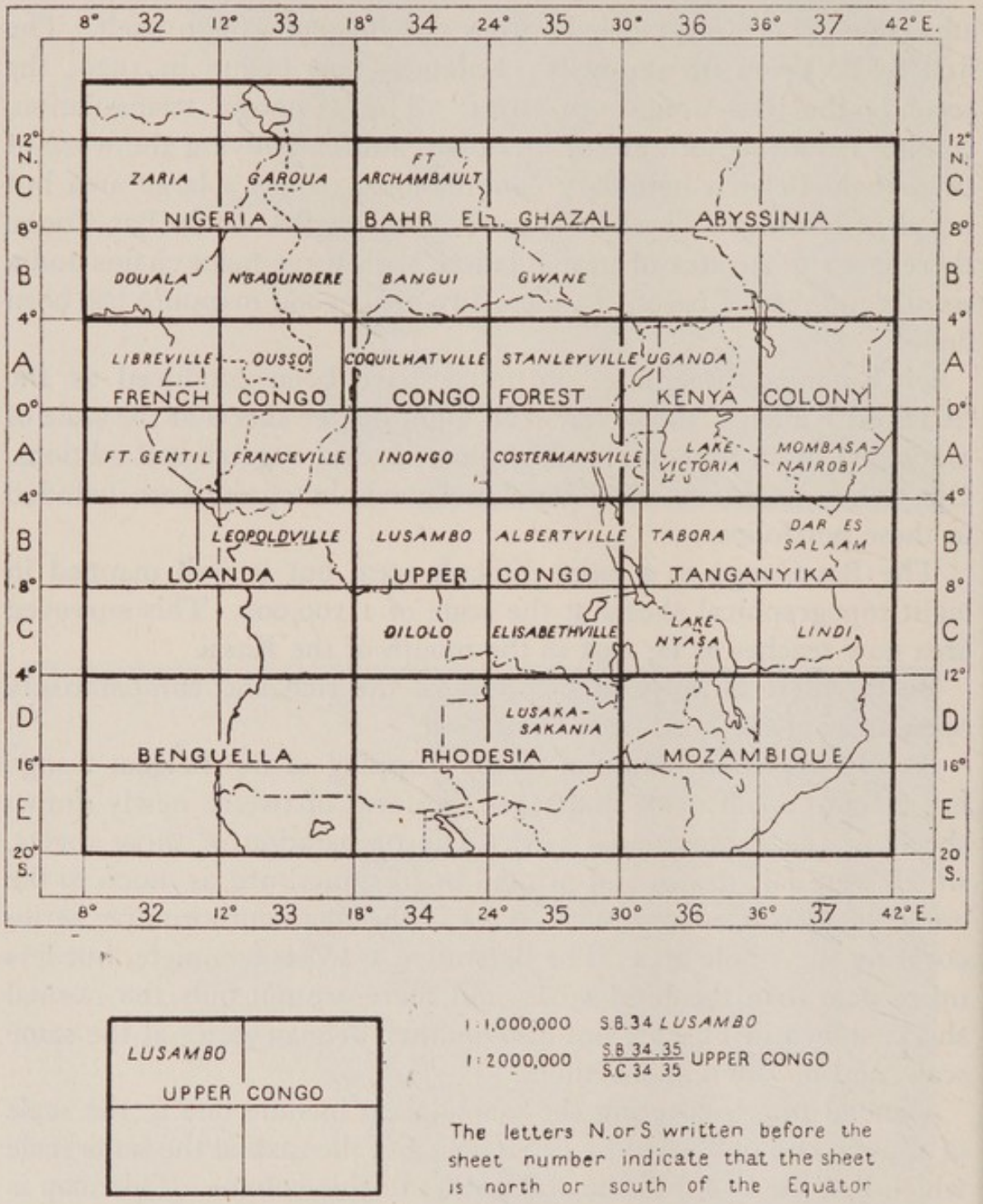


FIG. 87. *Index to the 1/M, and 1/2M, maps*

For that reason an index to the sheets and their names is included on Fig. 87. It may also be useful to see, in figure form, an estimate of the reliability of the maps in question, and Fig. 88 endeavours to give that help.

Geological Maps

FOURMARIER, P. 'Carte géologique du Congo Belge', 1:2,000,000, 2nd edn. *Revue Universelle des Mines*, Liége, 1930, vol. iii, pp. 345–380, 6 figs. and map.

DELHAYE, F., and SALÉE, A. *Carte géologique de l'Urundi et du Ruanda au 200:000e*. Brussels, 1928.

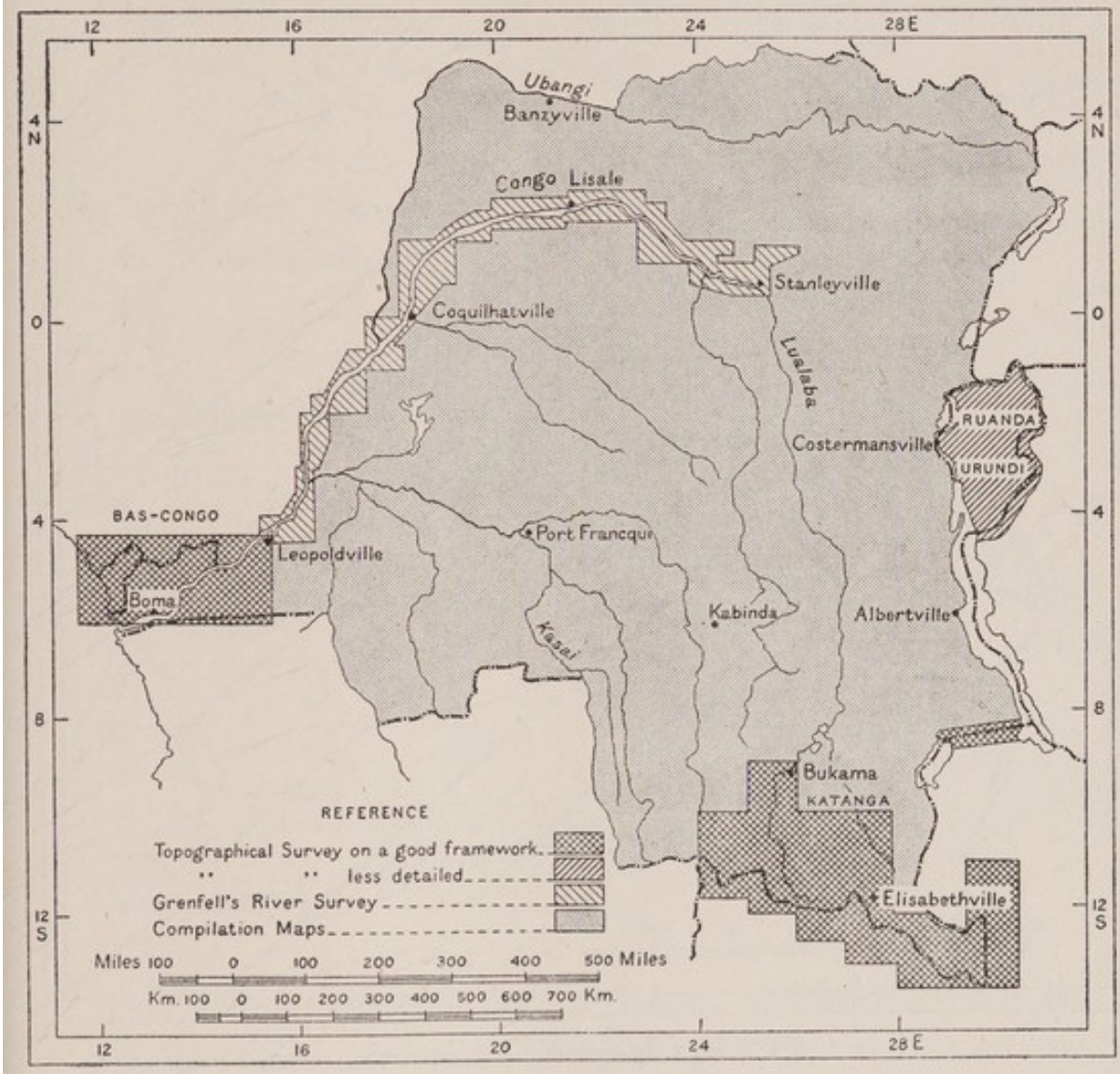


FIG. 88. *Reliability Map*

ROBERT, M. 'Carte géologique du Katanga', 1:1,000,000, in *Nouv. Mém. de la Soc. belge de Géol.*, 1931, No. 5, pp. 1–14, and map.

Carte géologique du Congo Belge au 500,000e. Brussels (Ministère des Colonies), 1933. (Incomplete: 10 sheets published to 1939.)

'Résultats scientifiques de la Mission géologique du Comité National du Kivu', in *Mém. de l'Inst. Géol. de l'Univ. de*

Louvain, 1939, vol. ix. (Includes 1:500,000 geol. maps of the Kivu region.)

Other Maps of Interest

1. *Principales productions, minérales, végétales et animales. Voies de communication.* 1:3,000,000 dressée par M. Norbet Laude,

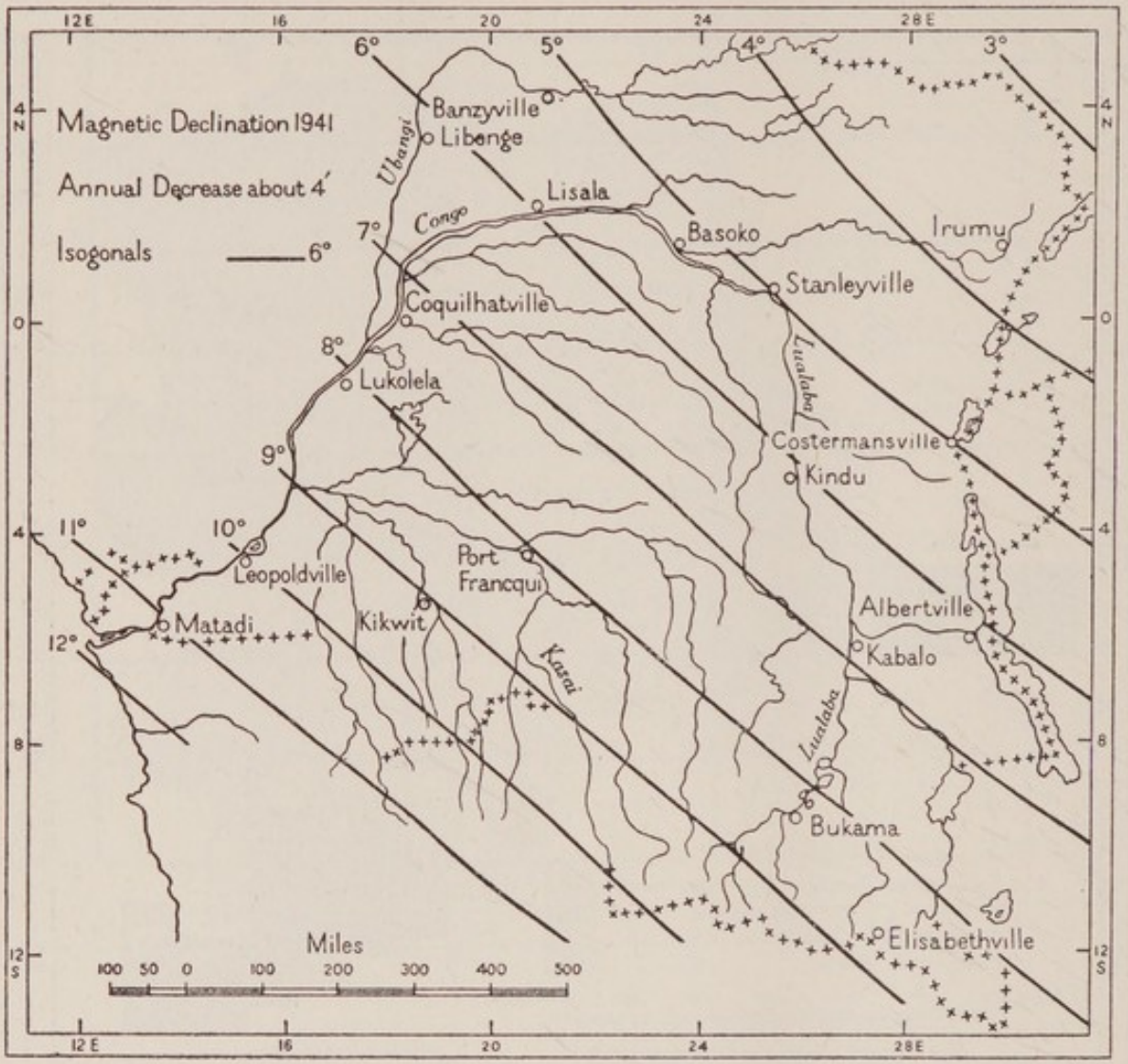


FIG. 89. *Magnetic Variation*

Directeur de l'Université Coloniale de Belgique, Professeur de Géographie Économique 1937–1938.

2. *Forests.* Maps in *Congo, Revue générale de la Colonie belge*, 1937, vol. i, published by the Directeur-général au Ministère des Colonies.

3. *Tribes.* Sketch-maps in *Les Peuplades du Congo Belge, Nom et Situation Géographique.* J. Maes and O. Boone. Brussels, 1935.

4. *Carte Routière du Congo Belge*, 1:2,000,000, Touring Club du Congo Belge.

Isogonals. No proper magnetic survey has been carried out, as yet. Fig. 89 gives a fairly reliable picture of the isogonals.

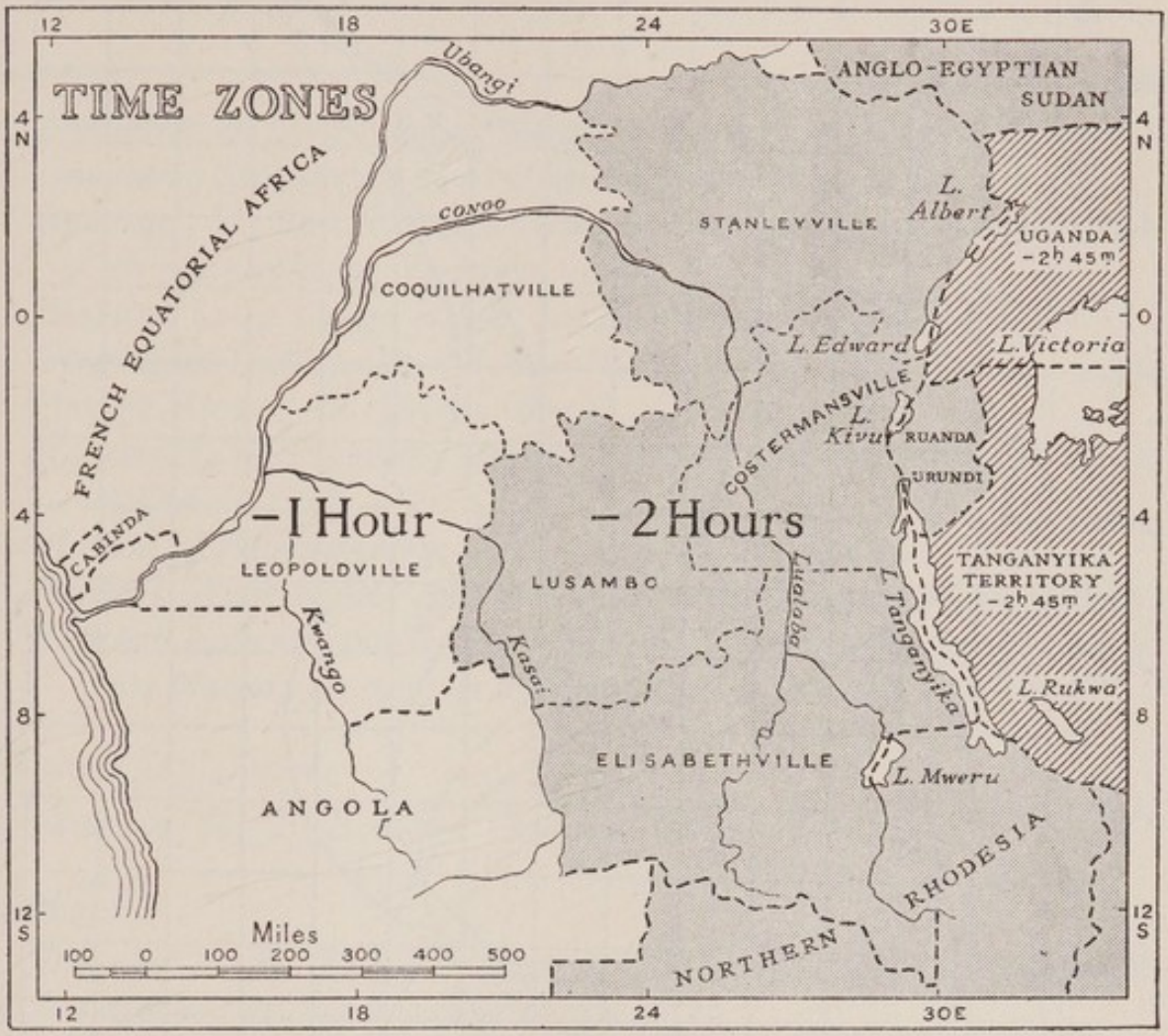


FIG. 90

Time. Fig. 90 shows the time zones of the Belgian Congo.

Sunset. Times of sunset are shown on Fig. 91, for which the arguments are times of day and times of year, whilst the G.M.T. hour of sunset can be read along the appropriate curve of latitude.

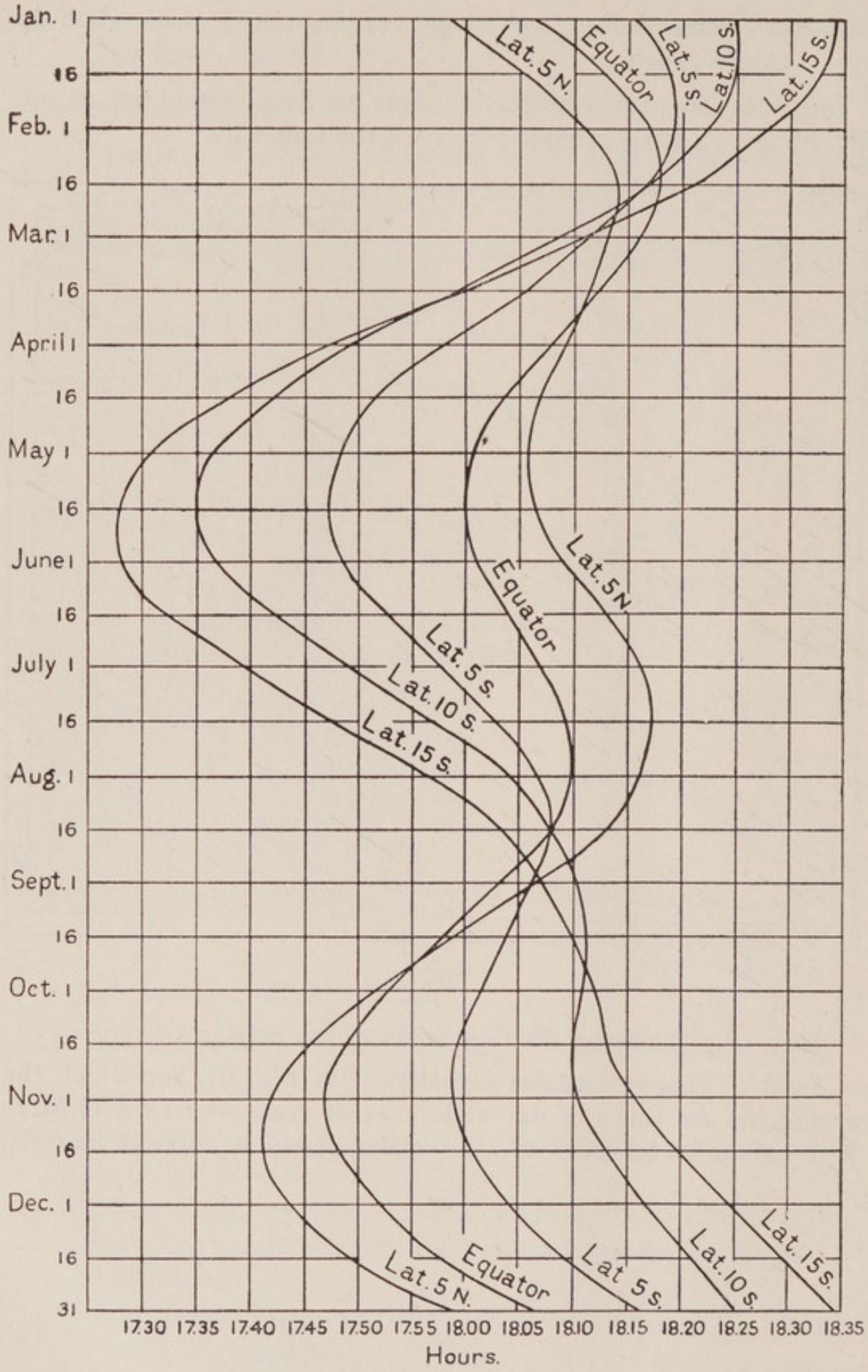


FIG. 91. *Times of Sunset*

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Maps, diagrams, and line drawings have been prepared by the drawing office of the Oxford Sub-Centre under the direction of K. W. Hartland (late Survey of Northern Rhodesia).

CONVERSION TABLES

METRIC AND BRITISH UNITS

All metallic standards are subject to molecular change. Tables differ according to the date of the comparison on which they rest. These are based on the 1896 comparison between Yard and Metre, which gives:

1 metre = 39·370113 inches.

Tables 1 to 6 give the ratios between units of the same sort.

Space, and printing, deny the use of many decimal figures. Therefore such a figure as 0·00000032 is given as $3{\cdot}2 \times 10^{-7}$ (which means that the first significant figure is the seventh after the decimal point: 0·0001925 becomes $1{\cdot}925 \times 10^{-4}$, and 0·0000734 is $7{\cdot}34 \times 10^{-5}$).

Tables 7 to 20 give ratios *in extenso* between single units.
These deal with conversions from metric into the equivalent British units.

Figures referring to metric units are given in italics; metric units (1 to 9) are given at the top of each table, reading horizontally from left to right; metric tens read vertically from top to bottom on extreme right and left of the table.

Thus in Table 8, if *87* centimetres are to be converted to inches, the *8* is read on the left or right edge, and, following the horizontal line until the 7 unit column is reached, the answer 34·252 is read.

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TABLE 1. UNITS OF LENGTH

Nautical mile	*Statute mile*	*Kilometre*	*Metre*	*Yard*	*Foot*	*Inch*	*Centimetre*
1	1·152	1·853	1853	2027	†6080	72,960	185,300
$8{\cdot}684\times10^{-1}$	*1*	1·60934	1609·34	1760	5280	63,360	160,934
$5{\cdot}396\times10^{-1}$	$6{\cdot}21372\times10^{-1}$	*1*	1000	1093·61	3280·84	39,370·1	100,000
$5{\cdot}396\times10^{-4}$	$6{\cdot}21372\times10^{-4}$	$1{\cdot}0\times10^{-3}$	*1*	1·09361	3·28084	39·3701	100
$4{\cdot}934\times10^{-4}$	$5{\cdot}68182\times10^{-4}$	$9{\cdot}14399\times10^{-4}$	$9{\cdot}14399\times10^{-1}$	*1*	3	36	91·4399
$1{\cdot}645\times10^{-4}$	$1{\cdot}89394\times10^{-4}$	$3{\cdot}048\times10^{-4}$	$3{\cdot}048\times10^{-1}$	$3{\cdot}33333\times10^{-1}$	*1*	12	30·48(00)
$1{\cdot}371\times10^{-5}$	$1{\cdot}57828\times10^{-5}$	$2{\cdot}54\times10^{-5}$	$2{\cdot}54\times10^{-2}$	$2{\cdot}77778\times10^{-2}$	$8{\cdot}33333\times10^{-2}$	*1*	2·54(000)
$5{\cdot}396\times10^{-6}$	$6{\cdot}21372\times10^{-6}$	$1{\cdot}0\times10^{-5}$	$1{\cdot}0\times10^{-2}$	$1{\cdot}09361\times10^{-2}$	$3{\cdot}28084\times10^{-2}$	$3{\cdot}93701\times10^{-1}$	*1*

† This is the customary British practice, and not the international nautical mile, of 1852 metres, which Great Britain has not adopted.

Rough rules: 1 millimetre = 0·04 inch.
1 metre = $\frac{10}{3}$ feet.
1 kilometre = $\frac{5}{8}$ of a mile.

TABLE 2. UNITS OF AREA

Square mile	*Square kilometre*	*Hectare*	*Acre*	*Square metre*	*Square yard*	*Square foot*
1	2·58998	258·998	640	$258{,}998\times10$	$30{,}976\times10^{3}$	$278{,}784\times10^{2}$
$3{\cdot}86103\times10^{-1}$	*1*	100	247·106	1,000,000	$119{,}599\times10$	$107{,}639\times10^{2}$
$3{\cdot}86103\times10^{-3}$	$1{\cdot}0\times10^{-2}$	*1*	2·47106	10,000	11,959·9	107,639
$1{\cdot}5625\times10^{-3}$	$4{\cdot}04685\times10^{-3}$	$4{\cdot}04685\times10^{-1}$	*1*	4046·85	4840	43,560
$3{\cdot}86103\times10^{-7}$	$1{\cdot}0\times10^{-6}$	$1{\cdot}0\times10^{-4}$	$2{\cdot}47106\times10^{-4}$	*1*	1·19599	10·7639
$3{\cdot}22831\times10^{-7}$	$8{\cdot}36126\times10^{-7}$	$8{\cdot}36126\times10^{-5}$	$2{\cdot}06612\times10^{-4}$	$8{\cdot}36126\times10^{-1}$	*1*	9
$3{\cdot}58701\times10^{-8}$	$9{\cdot}29029\times10^{-8}$	$9{\cdot}29029\times10^{-6}$	$2{\cdot}29568\times10^{-5}$	$9{\cdot}29029\times10^{-2}$	$1{\cdot}11111\times10^{-1}$	*1*

Rough rules: 1 square kilometre = $\frac{3}{8}$ square mile.
1 hectare = $2\frac{1}{2}$ acres.

TABLE 3. UNITS OF VOLUME

Kilolitre	*Cubic metre*	*Cubic yard*	*Bushel*	*Cubic foot*	*Imp. gall.*	*Litre*	*Pint*
1	1·000027	1·30799	27·4969	35·3157	219·976	1000	1759·80
$9{\cdot}99973 \times 10^{-1}$	1	1·30795	27·4962	35·3148	219·970	999·973	1759·75
$7{\cdot}64532 \times 10^{-1}$	$7{\cdot}64553 \times 10^{-1}$	1	21·0223	27	168·178	764·532	1345·43
$3{\cdot}63677 \times 10^{-2}$	$3{\cdot}63687 \times 10^{-2}$	$4{\cdot}75685 \times 10^{-2}$	1	1·28435	8	36·3677	64
$2{\cdot}83160 \times 10^{-2}$	$2{\cdot}83167 \times 10^{-2}$	$3{\cdot}70370 \times 10^{-2}$	$7{\cdot}78602 \times 10^{-1}$	1	6·22882	28·3160	49·8306
$4{\cdot}54596 \times 10^{-3}$	$4{\cdot}54608 \times 10^{-3}$	$5{\cdot}94607 \times 10^{-3}$	$1{\cdot}25 \times 10^{-1}$	$1{\cdot}60544 \times 10^{-1}$	1	4·54596	8
$1{\cdot}0 \times 10^{-3}$	$1{\cdot}000027 \times 10^{-3}$	$1{\cdot}30799 \times 10^{-3}$	$2{\cdot}74969 \times 10^{-2}$	$3{\cdot}53157 \times 10^{-2}$	$2{\cdot}19976 \times 10^{-1}$	1	1·75980
$5{\cdot}68245 \times 10^{-4}$	$5{\cdot}68260 \times 10^{-4}$	$7{\cdot}43258 \times 10^{-4}$	$1{\cdot}5625 \times 10^{-2}$	$2{\cdot}00680 \times 10^{-2}$	$1{\cdot}25 \times 10^{-1}$	$5{\cdot}68245 \times 10^{-1}$	1

TABLE 4. UNITS OF WEIGHT

† *Ton*	*Millier or metric ton*	*Quintal*	*Kilogramme*	*lb.*
1	1·01605	10·1605	1016·05	2240
$9{\cdot}84207 \times 10^{-1}$	1	10	1000	2204·62
$9{\cdot}84207 \times 10^{-2}$	$1{\cdot}0 \times 10^{-1}$	1	100	220·462
$9{\cdot}84207 \times 10^{-4}$	$1{\cdot}0 \times 10^{-3}$	$1{\cdot}0 \times 10^{-2}$	1	2·20462
$4{\cdot}46429 \times 10^{-4}$	$4{\cdot}53592 \times 10^{-4}$	$4{\cdot}53592 \times 10^{-3}$	$4{\cdot}53592 \times 10^{-1}$	1

† The ton of 2240 lb. is sometimes called the "Long Ton" to distinguish it from the "Short Ton" of 2000 lb.

Rough rule: To turn metric into British tons deduct 1½ per cent.

TABLE 5. UNITS OF PRESSURE

Atmosphere normal 760 mm. Hg at 0° C. ($g = 980{\cdot}665$ cm. per sec. per sec.)	*Bar ($= 10^6$ dynes per sq. cm.)*	*lb. per sq. inch ($g = 980{\cdot}665$ cm. per sec. per sec.)*	*Inches of mercury at 32° F. ($g = 980{\cdot}665$ cm. per sec. per sec.)*	*Millibars (1,000 dynes per sq. cm.)*
1	1·01325	14·6959	29·9213	1013·25
$9{\cdot}86923 \times 10^{-1}$	1	14·5037	29·5300	1000
$6{\cdot}80461 \times 10^{-2}$	$6{\cdot}89477 \times 10^{-2}$	1	2·03603	68·9477
$3{\cdot}34210 \times 10^{-2}$	$3{\cdot}38639 \times 10^{-2}$	$4{\cdot}91153 \times 10^{-1}$	1	33·8639
$9{\cdot}86923 \times 10^{-4}$	$1{\cdot}0 \times 10^{-3}$	$1{\cdot}45037 \times 10^{-2}$	$2{\cdot}95300 \times 10^{-2}$	1

TABLE 6. YIELD PER AREA

Ton per acre	*Metric ton per hectare*	*Quintal per hectare*
1	2·51071	25·1071
$3{\cdot}98294 \times 10^{-1}$	1	10
$3{\cdot}98294 \times 10^{-2}$	$1{\cdot}0 \times 10^{-1}$	1

TABLE 7. METRES TO FEET. 1 metre = 3·28084 feet

	0	1	2	3	4	5	6	7	8	9	
	..	3·3	6·6	9·8	13·1	16·4	19·7	23·0	26·3	29·5	
1	32·8	36·1	39·4	42·7	45·9	49·2	52·5	55·8	59·1	62·3	1
2	65·6	68·9	72·2	75·5	78·7	82·0	85·3	88·6	91·9	95·1	2
3	98·4	101·7	105·0	108·3	111·6	114·8	118·1	121·4	124·7	128·0	3
4	131·2	134·5	137·8	141·1	144·4	147·6	150·9	154·2	157·5	160·8	4
5	164·0	167·3	170·6	173·9	177·2	180·5	183·7	187·0	190·3	193·6	5
6	196·9	200·1	203·4	206·7	210·0	213·3	216·5	219·8	223·1	226·4	6
7	229·7	232·9	236·2	239·5	242·8	246·1	249·3	252·6	255·9	259·2	7
8	262·5	265·8	269·0	272·3	275·6	278·9	282·2	285·4	288·7	292·0	8
9	295·3	298·6	301·8	305·1	308·4	311·7	315·0	318·2	321·5	324·8	9
10	328·1	331·4	334·6	337·9	341·2	344·5	347·8	351·0	354·3	357·6	10
11	360·9	364·2	357·5	370·7	374·0	377·3	380·6	383·9	387·1	390·4	11
12	393·7	397·0	400·3	403·5	406·8	410·1	413·4	416·7	419·9	423·2	12
13	426·5	429·8	433·1	436·4	439·6	442·9	446·2	449·5	452·8	456·0	13
14	459·3	462·6	465·9	469·2	472·4	475·7	479·0	482·3	485·6	488·8	14
15	492·1	495·4	498·7	502·0	505·2	508·5	511·8	515·1	518·4	521·7	15
16	524·9	528·2	531·5	534·8	538·1	541·3	544·6	547·9	551·2	554·5	16
17	557·7	561·0	564·3	567·6	570·9	574·1	577·4	580·7	584·0	587·3	17
18	590·6	593·8	597·1	600·4	603·7	607·0	610·2	613·5	616·8	620·1	18
19	623·4	626·6	629·9	633·2	636·5	639·8	643·0	646·3	649·6	652·9	19
20	656·2	659·4	662·7	666·0	669·3	672·6	675·9	679·1	682·4	685·7	20
21	689·0	692·3	695·5	698·8	702·1	705·4	708·7	711·9	715·2	718·5	21
22	721·8	725·1	728·3	731·6	734·9	738·2	741·5	744·8	748·0	751·3	22
23	754·6	757·9	761·2	764·4	767·7	771·0	774·3	777·6	780·8	784·1	23
24	787·4	790·7	794·0	797·2	800·5	803·8	807·1	810·4	813·7	816·9	24
25	820·2	823·5	826·8	830·1	833·3	836·6	839·9	843·2	846·5	849·7	25
26	853·0	856·3	859·6	862·9	866·1	869·4	872·7	876·0	879·3	882·5	26
27	885·8	889·1	892·4	895·7	899·0	902·2	905·5	908·8	912·1	915·4	27
28	918·6	921·9	925·2	928·5	931·8	935·0	938·3	941·6	944·9	948·2	28
29	951·4	954·7	958·0	961·3	964·6	967·8	971·1	974·4	977·7	981·0	29
30	984·3	987·5	990·8	994·1	997·4	1000·7	1003·9	1007·2	1010·5	1013·8	30
31	1017·1	1020·3	1023·6	1026·9	1030·2	1033·5	1036·7	1040·0	1043·3	1046·6	31
32	1049·9	1053·1	1056·4	1059·7	1063·0	1066·3	1069·6	1072·8	1076·1	1079·4	32

	0	1	2	3	4	5	6	7	8	9	
33	1082·7	1086·0	1089·2	1092·5	1095·8	1099·1	1102·4	1105·6	1108·9	1112·2	33
34	1115·5	1118·8	1122·0	1125·3	1128·6	1131·9	1135·2	1138·5	1141·7	1145·0	34
35	1148·3	1151·6	1154·9	1158·1	1161·4	1164·7	1168·0	1171·3	1174·5	1177·8	35
36	1181·1	1184·4	1187·7	1190·9	1194·2	1197·5	1200·8	1204·1	1207·3	1210·6	36
37	1213·9	1217·2	1220·5	1223·8	1227·0	1230·3	1233·6	1236·9	1240·2	1243·4	37
38	1246·7	1250·0	1253·3	1256·6	1259·8	1263·1	1266·4	1269·7	1273·0	1276·2	38
39	1279·5	1282·8	1286·1	1289·4	1292·7	1295·9	1299·2	1302·5	1305·8	1309·1	39
40	1312·3	1315·6	1318·9	1322·2	1325·5	1328·7	1332·0	1335·3	1338·6	1341·9	40
41	1345·1	1348·4	1351·7	1355·0	1358·3	1361·5	1364·8	1368·1	1371·4	1374·7	41
42	1378·0	1381·2	1384·5	1387·8	1391·1	1394·4	1397·6	1400·9	1404·2	1407·5	42
43	1410·8	1414·0	1417·3	1420·6	1423·9	1427·2	1430·4	1433·7	1437·0	1440·3	43
44	1443·6	1446·9	1450·1	1453·4	1456·7	1460·0	1463·3	1466·5	1469·8	1473·1	44
45	1476·4	1479·7	1482·9	1486·2	1489·5	1492·8	1496·1	1499·3	1502·6	1505·9	45
46	1509·2	1512·5	1515·7	1519·0	1522·3	1525·6	1528·9	1532·2	1535·4	1538·7	46
47	1542·0	1545·3	1548·6	1551·8	1555·1	1558·4	1561·7	1565·0	1568·2	1571·5	47
48	1574·8	1578·1	1581·4	1584·6	1587·9	1591·2	1594·5	1597·8	1601·0	1604·3	48
49	1607·6	1610·9	1614·2	1617·5	1620·7	1624·0	1627·3	1630·6	1633·9	1637·1	49
50	1640·4	1643·7	1647·0	1650·3	1653·6	1656·8	1660·1	1663·4	1666·7	1669·9	50
51	1673·2	1676·5	1679·8	1683·1	1686·4	1689·6	1692·9	1696·2	1699·5	1702·8	51
52	1706·0	1709·3	1712·6	1715·9	1719·2	1722·4	1725·7	1729·0	1732·3	1735·6	52
53	1738·8	1742·1	1745·4	1748·7	1752·0	1755·2	1758·5	1761·8	1765·1	1768·4	53
54	1771·7	1774·9	1778·2	1781·5	1784·8	1788·1	1791·3	1794·6	1797·9	1801·2	54
55	1804·5	1807·8	1811·0	1814·3	1817·6	1820·9	1824·1	1827·4	1830·7	1834·0	55
56	1837·3	1840·6	1843·8	1847·1	1850·4	1853·7	1857·0	1860·2	1863·5	1866·8	56
57	1870·1	1873·4	1876·6	1879·9	1883·2	1886·5	1889·8	1893·0	1896·3	1899·6	57
58	1902·9	1906·2	1909·4	1912·7	1916·0	1919·3	1922·6	1925·9	1929·1	1932·4	58
59	1935·7	1939·0	1942·3	1945·5	1948·8	1952·1	1955·4	1958·7	1961·9	1965·2	59
60	1968·5	1971·8	1975·1	1978·3	1981·6	1984·9	1988·2	1991·5	1994·8	1998·0	60
61	2001·3	2004·6	2007·9	2011·1	2014·4	2017·7	2021·0	2024·3	2027·6	2030·8	61
62	2034·1	2037·4	2040·7	2044·0	2047·2	2050·5	2053·8	2057·1	2060·4	2063·6	62
63	2066·9	2070·2	2073·5	2076·8	2080·1	2083·3	2086·6	2089·9	2093·2	2096·5	63
64	2099·7	2103·0	2106·3	2109·6	2112·9	2116·1	2119·4	2122·7	2126·0	2129·3	64
65	2132·5	2135·8	2139·1	2142·4	2145·7	2149·0	2152·3	2155·5	2158·8	2162·1	65
66	2165·4	2168·6	2171·9	2175·2	2178·5	2181·8	2185·1	2188·3	2191·6	2194·9	66

	0	1	2	3	4	5	6	7	8	9	
67	2198·2	2201·5	2204·7	2208·0	2211·3	2214·6	2217·9	2221·1	2224·4	2227·7	67
68	2231·0	2234·3	2237·5	2240·8	2244·1	2247·4	2250·7	2253·9	2257·2	2260·5	68
69	2263·8	2267·1	2270·4	2273·6	2276·9	2280·2	2283·5	2286·8	2290·0	2293·3	69
70	2296·6	2299·9	2303·2	2306·4	2309·7	2313·0	2316·3	2319·6	2322·8	2326·1	70
71	2329·4	2332·7	2336·0	2339·2	2342·5	2345·8	2349·1	2352·4	2355·6	2358·9	71
72	2362·2	2365·5	2368·8	2372·0	2375·3	2378·6	2381·9	2385·2	2388·5	2391·7	72
73	2395·0	2398·3	2401·6	2404·9	2408·1	2411·4	2414·7	2418·0	2421·3	2424·5	73
74	2427·8	2431·1	2434·4	2437·7	2440·9	2444·2	2447·5	2450·8	2454·1	2457·3	74
75	2460·6	2463·9	2467·2	2470·5	2473·8	2477·0	2480·3	2483·6	2486·9	2490·2	75
76	2493·4	2496·7	2500·0	2503·3	2506·6	2509·8	2513·1	2516·4	2519·7	2523·0	76
77	2526·2	2529·5	2532·8	2536·1	2539·4	2542·7	2545·9	2549·2	2552·5	2555·8	77
78	2559·1	2562·3	2565·6	2568·9	2572·2	2575·5	2578·7	2582·0	2585·3	2588·6	78
79	2591·9	2595·1	2598·4	2601·7	2605·0	2608·3	2611·5	2614·8	2618·1	2621·4	79
80	2624·7	2628·0	2631·2	2634·5	2637·8	2641·1	2644·4	2647·6	2650·9	2654·2	80
81	2657·5	2660·8	2664·0	2667·3	2670·6	2673·9	2677·2	2680·4	2683·7	2687·0	81
82	2690·3	2693·6	2696·9	2700·1	2703·4	2706·7	2710·0	2713·3	2716·5	2719·8	82
83	2723·1	2726·4	2729·7	2732·9	2736·2	2739·5	2742·8	2746·1	2749·3	2752·6	83
84	2755·9	2759·2	2762·5	2765·7	2769·0	2772·3	2775·6	2778·9	2782·2	2785·4	84
85	2788·7	2792·0	2795·3	2798·6	2801·8	2805·1	2808·4	2811·7	2815·0	2818·2	85
86	2821·5	2824·8	2828·1	2831·4	2834·6	2837·9	2841·2	2844·5	2847·8	2851·0	86
87	2854·3	2857·6	2860·9	2864·2	2867·5	2870·7	2874·0	2877·3	2880·6	2883·9	87
88	2887·1	2890·4	2893·7	2897·0	2900·3	2903·5	2906·8	2910·1	2913·4	2916·7	88
89	2919·9	2923·2	2926·5	2929·8	2933·1	2936·4	2939·6	2942·9	2946·2	2949·5	89
90	2952·8	2956·0	2959·3	2962·6	2965·9	2969·2	2972·4	2975·7	2979·0	2982·3	90
91	2985·6	2988·8	2992·1	2995·4	2998·7	3002·0	3005·2	3008·5	3011·8	3015·1	91
92	3018·4	3021·7	3024·9	3028·2	3031·5	3034·8	3038·1	3041·3	3044·6	3047·9	92
93	3051·2	3054·5	3057·7	3061·0	3064·3	3067·6	3070·9	3074·1	3077·4	3080·7	93
94	3084·0	3087·3	3090·6	3093·8	3097·1	3100·4	3103·7	3107·0	3110·2	3113·5	94
95	3116·8	3120·1	3123·4	3126·6	3129·9	3133·2	3136·5	3139·8	3143·0	3146·3	95
96	3149·6	3152·9	3156·2	3159·4	3162·7	3166·0	3169·3	3172·6	3175·9	3179·1	96
97	3182·4	3185·7	3189·0	3192·3	3195·5	3198·8	3202·1	3205·4	3208·7	3211·9	97
98	3215·2	3218·5	3221·8	3225·1	3228·3	3231·6	3234·9	3238·2	3241·5	3244·8	98
99	3248·0	3251·3	3254·6	3257·9	3261·2	3264·4	3267·7	3271·0	3274·3	3277·6	99
100	3280·8										100

TABLE 8. CENTIMETRES TO INCHES

1 centimetre = 0·393701 inches

	0	1	2	3	4	5	6	7	8	9	
..	..	0·394	0·787	1·181	1·575	1·969	2·362	2·756	3·150	3·543	..
1	3·937	4·331	4·724	5·118	5·512	5·906	6·299	6·693	7·087	7·480	1
2	7·874	8·268	8·661	9·055	9·449	9·843	10·236	10·630	11·024	11·417	2
3	11·811	12·205	12·598	12·992	13·386	13·780	14·173	14·567	14·961	15·354	3
4	15·748	16·142	16·535	16·929	17·323	17·717	18·110	18·504	18·898	19·291	4
5	19·685	20·079	20·472	20·866	21·260	21·654	22·047	22·441	22·835	23·228	5
6	23·622	24·016	24·409	24·803	25·197	25·591	25·984	26·378	26·772	27·165	6
7	27·559	27·953	28·346	28·740	29·134	29·528	29·921	30·315	30·709	31·102	7
8	31·496	31·890	32·283	32·677	33·071	33·465	33·858	34·252	34·646	35·039	8
9	35·433	35·827	36·220	36·614	37·008	37·402	37·795	38·189	38·583	38·976	9
10	39·370										10

TABLE 9. KILOMETRES TO STATUTE MILES

1 kilometre = 0·621372 miles

	0	1	2	3	4	5	6	7	8	9	
..	..	0·621	1·243	1·864	2·485	3·107	3·728	4·350	4·971	5·592	..
1	6·214	6·835	7·456	8·078	8·699	9·321	9·942	10·563	11·185	11·806	1
2	12·427	13·049	13·670	14·292	14·913	15·534	16·156	16·777	17·398	18·020	2
3	18·641	19·263	19·884	20·505	21·127	21·748	22·369	22·991	23·612	24·234	3
4	24·855	25·476	26·098	26·719	27·340	27·962	28·583	29·204	29·826	30·447	4
5	31·069	31·690	32·311	32·933	33·554	34·175	34·797	35·418	36·040	36·661	5
6	37·282	37·904	38·525	39·146	39·768	40·389	41·011	41·632	42·253	42·875	6
7	43·496	44·117	44·739	45·360	45·982	46·603	47·224	47·846	48·467	49·088	7
8	49·710	50·331	50·952	51·574	52·195	52·817	53·438	54·059	54·681	55·302	8
9	55·923	56·545	57·166	57·788	58·409	59·030	59·652	60·273	60·894	61·516	9
10	62·137										10

TABLE 10. SQUARE METRES TO SQUARE FEET

1 square metre = 10·763911 square feet

	0	1	2	3	4	5	6	7	8	9	
..	..	10·764	21·528	32·292	43·056	53·820	64·583	75·347	86·111	96·875	..
1	107·639	118·403	129·167	139·931	150·695	161·459	172·222	182·986	193·750	204·514	1
2	215·278	226·042	236·806	247·570	258·334	269·098	279·861	290·625	301·389	312·153	2
3	322·917	333·681	344·445	355·209	365·973	376·737	387·501	398·265	409·029	419·792	3
4	430·556	441·320	452·084	462·848	473·612	484·376	495·140	505·904	516·668	527·432	4
5	538·196	548·959	559·723	570·487	581·251	592·015	602·779	613·543	624·307	635·071	5
6	645·835	656·599	667·363	678·126	688·890	699·654	710·418	721·182	731·946	742·710	6
7	753·474	764·238	775·002	785·765	796·529	807·293	818·057	828·821	839·585	850·349	7
8	861·113	871·877	882·641	893·405	904·169	914·932	925·696	936·460	947·224	957·988	8
9	968·752	979·516	990·280	1001·044	1011·808	1022·572	1033·335	1044·099	1054·863	1065·627	9
10	1076·3911										10

TABLE 11. HECTARES TO ACRES

1 hectare = 2·47106 acres

	0	1	2	3	4	5	6	7	8	9	
..	..	2·47	4·94	7·41	9·88	12·36	14·83	17·30	19·77	22·24	..
1	24·71	27·18	29·65	32·12	34·59	37·07	39·54	42·01	44·48	46·95	1
2	49·42	51·89	54·36	56·83	59·31	61·78	64·25	66·72	69·19	71·66	2
3	74·13	76·60	79·07	81·54	84·02	86·49	88·96	91·43	93·90	96·37	3
4	98·84	101·31	103·78	106·26	108·73	111·20	113·67	116·14	118·61	121·08	4
5	123·55	126·02	128·50	130·97	133·44	135·91	138·38	140·85	143·32	145·79	5
6	148·26	150·73	153·21	155·68	158·15	160·62	163·09	165·56	168·03	170·50	6
7	172·97	175·45	177·92	180·39	182·86	185·33	187·80	190·27	192·74	195·21	7
8	197·68	200·16	202·63	205·10	207·57	210·04	212·51	214·98	217·45	219·92	8
9	222·40	224·87	227·34	229·81	232·28	234·75	237·22	239·69	242·16	244·63	9
10	247·11										10

TABLE 12. SQUARE KILOMETRES TO SQUARE MILES

1 square kilometre = 0·386103 square miles

..	0	1	2	3	4	5	6	7	8	9	..
..	..	0·386	0·772	1·158	1·544	1·931	2·317	2·703	3·089	3·475	..
1	3·861	4·247	4·633	5·019	5·405	5·792	6·178	6·564	6·950	7·336	1
2	7·722	8·108	8·494	8·880	9·266	9·653	10·039	10·425	10·811	11·197	2
3	11·583	11·969	12·355	12·741	13·128	13·514	13·900	14·286	14·672	15·058	3
4	15·444	15·830	16·216	16·602	16·989	17·375	17·761	18·147	18·533	18·919	4
5	19·305	19·691	20·077	20·463	20·850	21·236	21·622	22·008	22·394	22·780	5
6	23·166	23·552	23·938	24·324	24·711	25·097	25·483	25·869	26·255	26·641	6
7	27·027	27·413	27·799	28·186	28·572	28·958	29·344	29·730	30·116	30·502	7
8	30·888	31·274	31·660	32·047	32·433	32·819	33·205	33·591	33·977	34·363	8
9	34·749	35·135	35·521	35·908	36·294	36·680	37·066	37·452	37·838	38·224	9
10	38·610										10

TABLE 13, CUBIC METRES TO CUBIC FEET

1 cubic metre = 35·3148 cubic feet

..	0	1	2	3	4	5	6	7	8	9	..
..	..	35·315	70·630	105·944	141·260	176·574	211·889	247·204	282·518	317·833	..
1	353·148	388·463	423·778	459·092	494·407	529·722	565·037	600·352	635·666	670·981	1
2	706·296	741·611	776·926	812·240	847·555	882·870	918·185	953·500	988·814	1024·129	2
3	1059·444	1094·759	1130·074	1165·388	1200·703	1236·018	1271·333	1306·648	1341·962	1377·277	3
4	1412·592	1447·907	1483·222	1518·536	1553·851	1589·166	1624·481	1659·796	1695·110	1730·425	4
5	1765·740	1801·055	1836·370	1871·684	1906·999	1942·314	1977·629	2012·944	2048·258	2083·573	5
6	2118·888	2154·203	2189·518	2224·832	2260·147	2295·462	2330·777	2366·092	2401·406	2436·721	6
7	2472·036	2507·351	2542·666	2577·980	2613·295	2648·610	2683·925	2719·240	2754·554	2789·869	7
8	2825·184	2860·499	2895·814	2931·128	2966·443	3001·758	3037·073	3072·388	3107·702	3143·017	8
9	3178·332	3213·647	3248·962	3284·276	3319·591	3354·906	3390·221	3425·536	3460·850	3496·165	9
10	3531·480										10

TABLE 14. KILOGRAMMES TO POUNDS

1 kilogramme = 2·20462 pounds

	0	1	2	3	4	5	6	7	8	9	
..	..	2·205	4·409	6·614	8·818	11·023	13·228	15·432	17·637	19·842	..
1	22·046	24·251	26·455	28·660	30·865	33·069	35·274	37·478	39·683	41·888	1
2	44·092	46·297	48·502	50·706	52·911	55·115	57·320	59·525	61·729	63·934	2
3	66·139	68·343	70·548	72·752	74·957	77·162	79·366	81·571	83·776	85·980	3
4	88·185	90·389	92·594	94·799	97·003	99·208	101·413	103·617	105·822	108·026	4
5	110·231	112·436	114·640	116·845	119·049	121·254	123·459	125·663	127·868	130·073	5
6	132·277	134·482	136·686	138·891	141·096	143·300	145·505	147·710	149·914	152·119	6
7	154·323	156·528	158·733	160·937	163·142	165·346	167·551	169·756	171·960	174·165	7
8	176·370	178·574	180·779	182·983	185·188	187·393	189·597	191·802	194·007	196·211	8
9	198·416	200·620	202·825	205·030	207·234	209·439	211·644	213·848	216·053	218·257	9
10	220·462										10

TABLE 15. LITRES TO GALLONS

1 litre = 0·219976 gallons

	0	1	2	3	4	5	6	7	8	9	
..	..	0·220	0·440	0·660	0·880	1·100	1·320	1·540	1·760	1·980	..
1	2·200	2·420	2·640	2·860	3·080	3·300	3·520	3·740	3·960	4·180	1
2	4·400	4·619	4·839	5·059	5·279	5·499	5·719	5·939	6·159	6·379	2
3	6·599	6·819	7·039	7·259	7·479	7·699	7·919	8·139	8·359	8·579	3
4	8·799	9·019	9·239	9·459	9·679	9·899	10·119	10·339	10·559	10·779	4
5	10·999	11·219	11·439	11·659	11·879	12·099	12·319	12·539	12·759	12·979	5
6	13·199	13·419	13·639	13·858	14·078	14·298	14·518	14·738	14·958	15·178	6
7	15·398	15·618	15·838	16·058	16·278	16·498	16·718	16·938	17·158	17·378	7
8	17·598	17·818	18·038	18·258	18·478	18·698	18·918	19·138	19·358	19·578	8
9	19·798	20·018	20·238	20·458	20·678	20·898	21·118	21·338	21·558	21·778	9
10	21·998										10

TABLE 16. METRIC TONS TO TONS

1 metric ton = 0·984207 ton

	0	1	2	3	4	5	6	7	8	9	
..	..	0·984	1·968	2·953	3·937	4·921	5·905	6·889	7·874	8·858	..
1	9·842	10·826	11·810	12·795	13·779	14·763	15·747	16·732	17·716	18·700	1
2	19·684	20·668	21·653	22·637	23·621	24·605	25·589	26·574	27·558	28·542	2
3	29·526	30·510	31·495	32·479	33·463	34·447	35·431	36·416	37·400	38·384	3
4	39·368	40·352	41·337	42·321	43·305	44·289	45·274	46·258	47·242	48·226	4
5	49·210	50·195	51·179	52·163	53·147	54·131	55·116	56·100	57·084	58·068	5
6	59·052	60·037	61·021	62·005	62·989	63·973	64·958	65·942	66·926	67·910	6
7	68·894	69·879	70·863	71·847	72·831	73·816	74·800	75·784	76·768	77·752	7
8	78·737	79·721	80·705	81·689	82·673	83·658	84·642	85·626	86·610	87·594	8
9	88·579	89·563	90·547	91·531	92·515	93·500	94·484	95·468	96·452	97·436	9
10	98·421										10

TABLE 17. QUINTALS PER HECTARE TO TONS PER ACRE

1 quintal per hectare = 0·0398294 ton per acre

	0	1	2	3	4	5	6	7	8	9	
..	..	0·03983	0·07966	0·11949	0·15932	0·19915	0·23898	0·27881	0·31864	0·35846	..
1	0·39829	0·43812	0·47795	0·51778	0·55761	0·59744	0·63727	0·67710	0·71693	0·75676	1
2	0·79659	0·83642	0·87625	0·91608	0·95591	0·99574	1·03556	1·07539	1·11522	1·15505	2
3	1·19488	1·23471	1·27454	1·31437	1·35420	1·39401	1·43386	1·47369	1·51352	1·55335	3
4	1·59318	1·63305	1·67283	1·71266	1·75249	1·79232	1·83215	1·87198	1·91181	1·95164	4
5	1·99147	2·03130	2·07113	2·11096	2·15079	2·19062	2·23045	2·27028	2·31011	2·34993	5
6	2·38976	2·42959	2·46942	2·50925	2·54908	2·58891	2·62874	2·66857	2·70840	2·74823	6
7	2·78806	2·82789	2·86772	2·90755	2·94738	2·98721	3·02703	3·06686	3·10669	3·14652	7
8	3·18635	3·22618	3·26601	3·30584	3·34567	3·38550	3·42533	3·46516	3·50499	3·54482	8
9	3·58465	3·62448	3·66430	3·70413	3·74396	3·78379	3·82362	3·86345	3·90328	3·94311	9
10	3·98294										10

TABLE 18. NUMBERS PER SQUARE KILOMETRE TO NUMBERS PER SQUARE MILE

(*or* Square Miles to Square Kilometres)

1 square mile = 2·58998 square kilometres

	0	1	2	3	4	5	6	7	8	9	
..	..	2·59	5·18	7·77	10·36	12·95	15·54	18·13	20·72	23·31	..
1	25·90	28·49	31·08	33·67	36·26	38·85	41·44	44·03	46·62	49·21	1
2	51·80	54·39	56·98	59·57	62·16	64·75	67·34	69·93	72·52	75·11	2
3	77·70	80·29	82·88	85·47	88·06	90·65	93·24	95·83	98·42	101·01	3
4	103·60	106·19	108·78	111·37	113·96	116·55	119·14	121·73	124·32	126·91	4
5	129·50	132·09	134·68	137·27	139·86	142·45	145·04	147·63	150·22	152·81	5
6	155·40	157·99	160·58	163·17	165·76	168·35	170·94	173·53	176·12	178·71	6
7	181·30	183·89	186·48	189·07	191·66	194·25	196·84	199·43	202·02	204·61	7
8	207·20	209·79	212·38	214·97	217·56	220·15	222·74	225·33	227·92	230·51	8
9	233·10	235·69	238·28	240·87	243·46	246·05	248·64	251·23	253·82	256·41	9
10	259·00										10

TABLE 19. DEGREES CENTIGRADE TO DEGREES FAHRENHEIT

1° Centigrade = 1·8° Fahrenheit

Centigrade minus

	−0	−1	−2	−3	−4	−5	−6	−7	−8	−9	
−2	−4·0	−5·8	−7·6	−9·4	−11·2	−13·0	−14·8	−16·6	−18·4	−20·2	−2
−1	14·0	12·2	10·4	8·6	6·8	5·0	3·2	1·4	−0·4	−2·2	−1
..	32·0	30·2	28·4	26·6	24·8	23·0	21·2	19·4	17·6	15·8	..
..	32·0	33·8	35·6	37·4	39·2	41·0	42·8	44·6	46·4	48·2	..
+ 1	50·0	51·8	53·6	55·4	57·2	59·0	60·8	62·6	64·4	66·2	+ 1
+ 2	68·0	69·8	71·6	73·4	75·2	77·0	78·8	80·6	82·4	84·2	+ 2
+ 3	86·0	87·8	89·6	91·4	93·2	95·0	96·8	98·6	100·4	102·2	+ 3
+ 4	104·0	105·8	107·6	109·4	111·2	113·0	114·8	116·6	118·4	120·2	+ 4
+ 5	122·0	123·8	125·6	127·4	129·2	131·0	132·8	134·6	136·4	138·2	+ 5
+ 6	140·0	141·8	143·6	145·4	147·2	149·0	150·8	152·6	154·4	156·2	+ 6
+ 7	158·0	159·8	161·6	163·4	165·2	167·0	168·8	170·6	172·4	174·2	+ 7
+ 8	176·0	177·8	179·6	181·4	183·2	185·0	186·8	188·6	190·4	192·2	+ 8
+ 9	194·0	195·8	197·6	199·4	201·2	203·0	204·8	206·6	208·4	210·2	+ 9
+10	212·0										+10
	0	1	2	3	4	5	6	7	8	9	

Centigrade plus

TABLE 20. PRESSURE: EQUIVALENTS OF MILLIBARS, MILLIMETRES OF MERCURY, AND INCHES OF MERCURY AT 32° F. IN LATITUDE 45°

Mercury in.	*Millibars*	*Mercury mm.*	*Mercury in.*	*Millibars*	*Mercury mm.*	*Mercury in.*	*Millibars*	*Mercury mm.*	*Mercury in.*	*Millibars*	*Mercury mm.*	*Mercury in.*	*Millibars*	*Mercury mm.*
27·02	915	686·3	27·82	942	706·6	28·62	969	726·8	29·41	996	747·1	30·21	1,023	767·3
27·05	916	687·1	27·85	943	707·3	28·65	970	727·6	29·44	997	747·8	30·24	1,024	768·1
27·08	917	687·8	27·88	944	708·1	28·67	971	728·3	29·47	998	748·6	30·27	1,025	768·8
27·11	918	688·6	27·91	945	708·8	28·70	972	729·1	29·50	999	749·3	30·30	1,026	769·6
27·14	919	689·3	27·94	946	709·6	28·73	973	729·8	29·53	1,000	750·1	30·33	1,027	770·3
27·17	920	690·1	27·97	947	710·3	28·76	974	730·6	29·56	1,001	750·8	30·36	1,028	771·1
27·20	921	690·8	28·00	948	711·1	28·79	975	731·3	29·59	1,002	751·6	30·39	1,029	771·8
27·23	922	691·6	28·03	949	711·8	28·82	976	732·1	29·62	1,003	752·3	30·42	1,030	772·6
27·26	923	692·3	28·05	950	712·6	28·85	977	732·8	29·65	1,004	753·1	30·45	1,031	773·3
27·29	924	693·1	28·08	951	713·3	28·88	978	733·6	29·68	1,005	753·8	30·48	1,032	774·1
27·32	925	693·8	28·11	952	714·1	28·91	979	734·3	29·71	1,006	754·6	30·51	1,033	774·8
27·35	926	694·6	28·14	953	714·8	28·94	980	735·1	29·74	1,007	755·3	30·53	1,034	775·6
27·38	927	695·3	28·17	954	715·6	28·97	981	735·8	29·77	1,008	756·1	30·56	1,035	776·3
27·41	928	696·1	28·20	955	716·3	29·00	982	736·6	29·80	1,009	756·8	30·59	1,036	777·1
27·44	929	696·8	28·23	956	717·1	29·03	983	737·3	29·83	1,010	757·6	30·62	1,037	777·8
27·46	930	697·6	28·26	957	717·8	29·06	984	738·1	29·86	1,011	758·3	30·65	1,038	778·6
27·49	931	698·3	28·29	958	718·6	29·09	985	738·8	29·89	1,012	759·1	30·68	1,039	779·3
27·52	932	699·1	28·32	959	719·3	29·12	986	739·6	29·92	1,013	759·8	30·71	1,040	780·1
27·55	933	699·8	28·35	960	720·1	29·15	987	740·3	29·94	1,014	760·6	30·74	1,041	780·8
27·58	934	700·6	28·38	961	720·8	29·18	988	741·1	29·97	1,015	761·3	30·77	1,042	781·6
27·61	935	701·3	28·41	962	721·6	29·21	989	741·8	30·00	1,016	762·1	30·80	1,043	782·3
27·64	936	702·1	28·44	963	722·3	29·24	990	742·6	30·03	1,017	762·8	30·83	1,044	783·1
27·67	937	702·8	28·47	964	723·1	29·26	991	743·3	30·06	1,018	763·6	30·86	1,045	783·8
27·70	938	703·6	28·50	965	723·8	29·29	992	744·1	30·09	1,019	764·3	30·89	1,046	784·6
27·73	939	704·3	28·53	966	724·6	29·32	993	744·8	30·12	1,020	765·1	30·92	1,047	785·3
27·76	940	705·1	28·56	967	725·3	29·35	994	745·6	30·15	1,021	765·8	30·95	1,048	786·1
27·79	941	705·8	28·59	968	726·1	29·38	995	746·3	30·18	1,022	766·6	30·98	1,049	786·8

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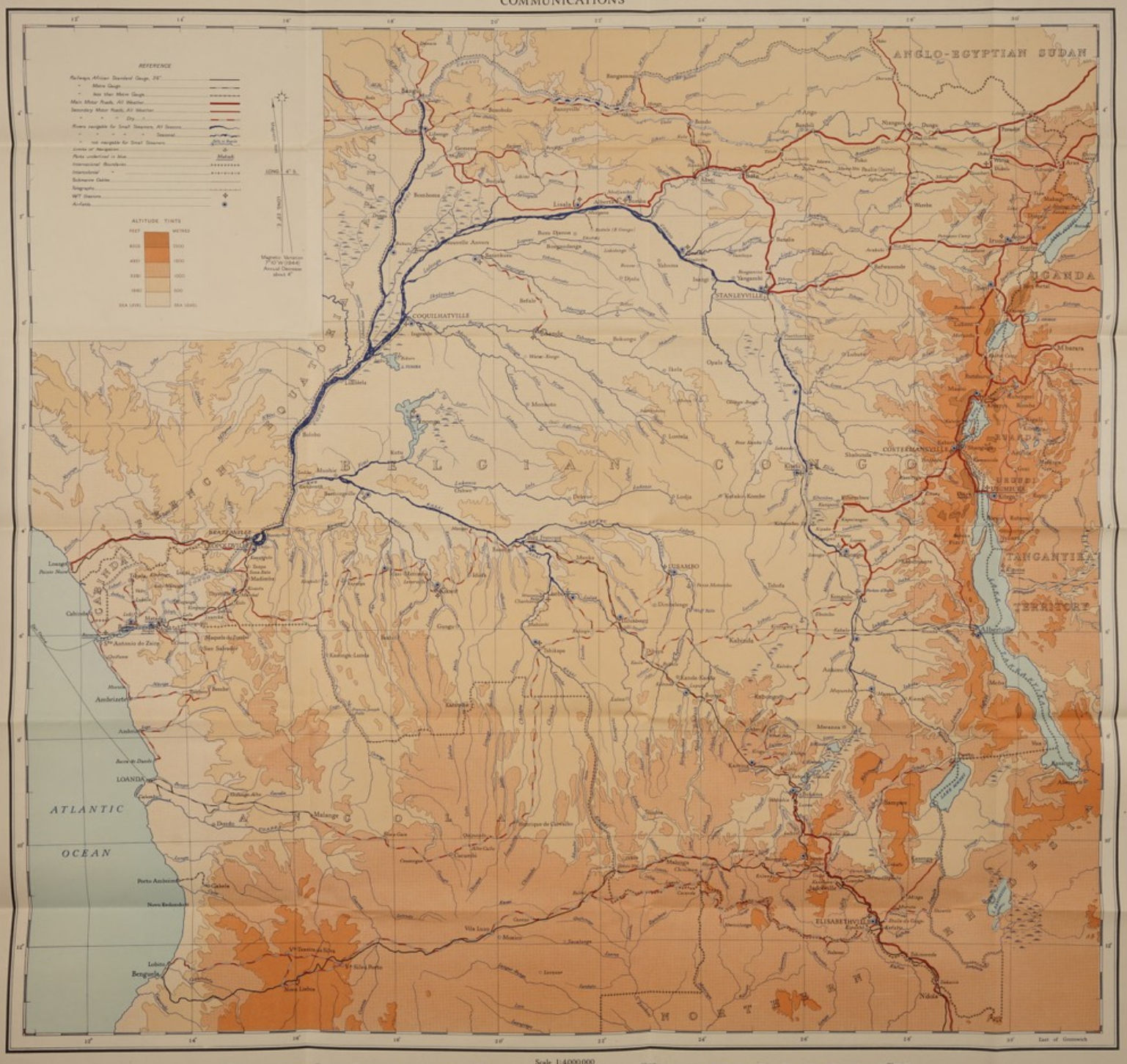
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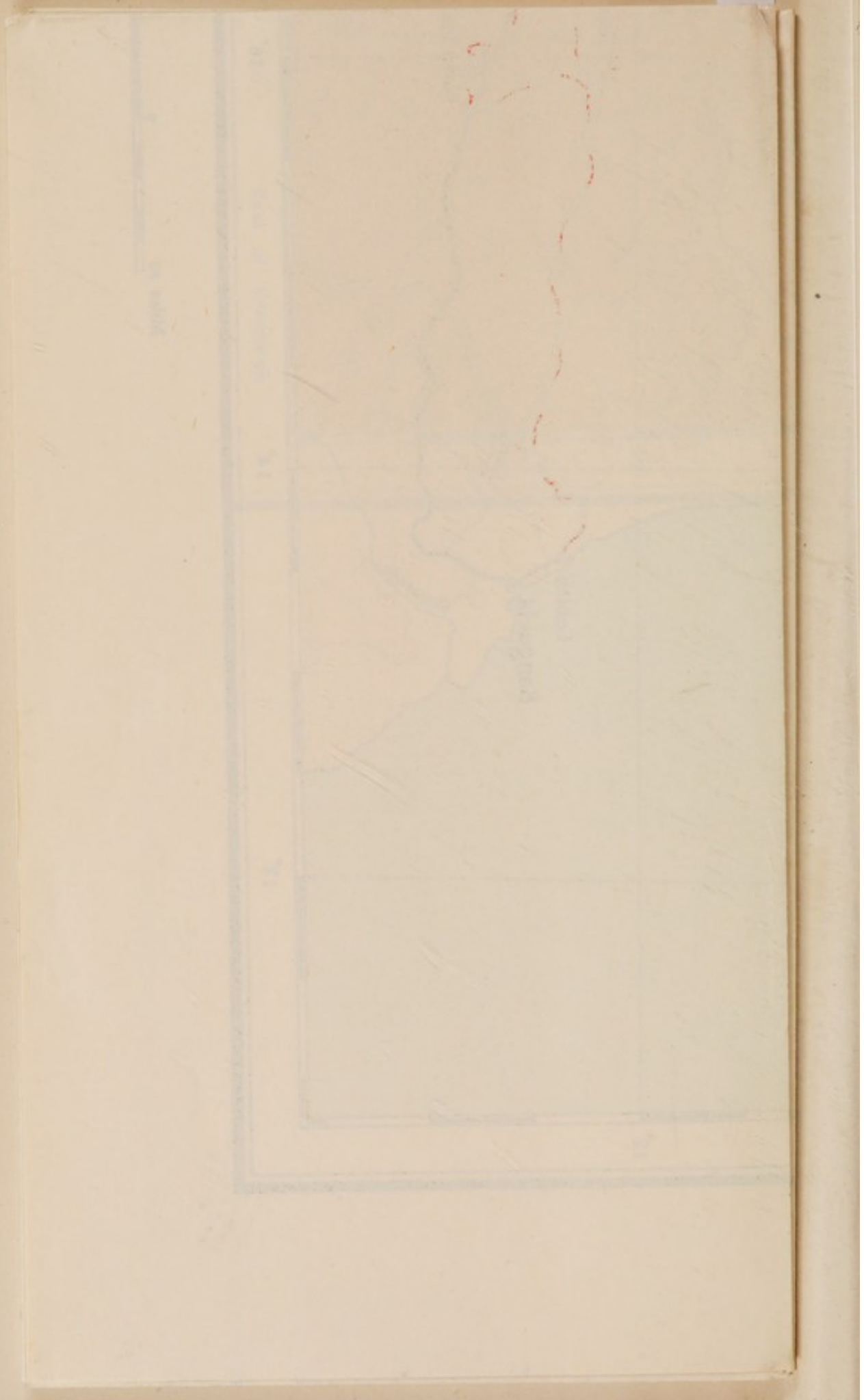
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