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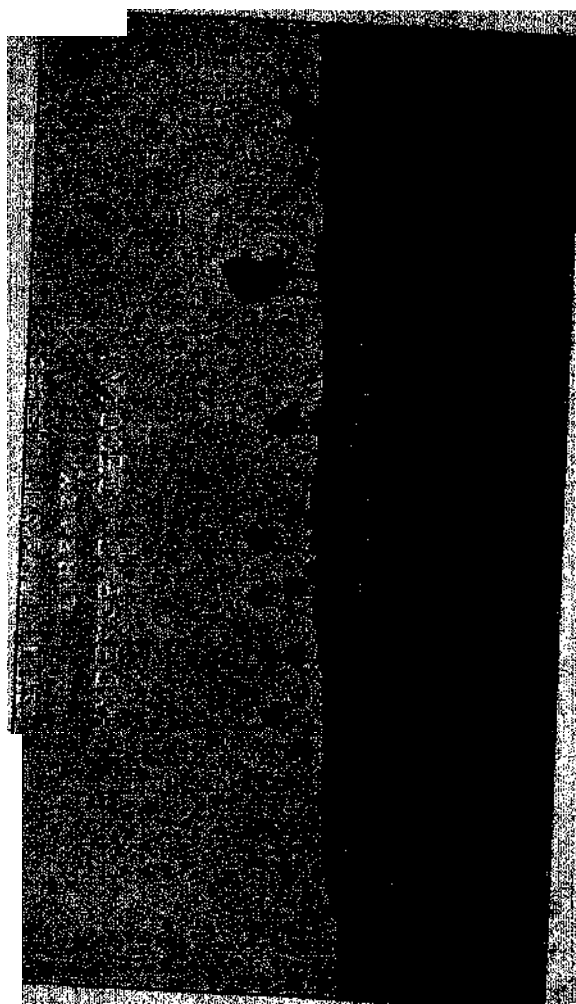
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A MORE concise view of the geography of Africa appears to be obtained by treating the majority of subjects concerned—physical conditions, man, economic conditions, &c.—from the 'continental' standpoint, than by dealing with them in relation to any series of divisions of the continent in succession. As it is the economic conditions of Africa that are of paramount interest for civilized peoples, special stress is laid upon them.

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POSITION AND EXTENT

1. *Position.* Geographically Africa forms a southwestern extension of Asia, to which it is attached by the Isthmus of Suez. It is of irregular triangular shape, with its base resting upon the Mediterranean and Red Sea and its apex at Cape Agulhas, where the South Atlantic merges into the Indian Ocean. Historically the fact that the base of Africa is at the north has been of special significance in the development of the continent. Topographically it is also of importance because the trend of the land-mass is from south to north, and the main drainage of the continent in past ages was also, in all probability, in the same direction.

2. *Extent.* Africa extends from 37° N. to 34° S., and thus the equator passes nearly through the middle of the continent ; though the northern portion, following the general development of the northern hemisphere, is more than double the size of the southern. The extreme point of west longitude is reached at Cape Verd, $17^{\circ} 20''$ W. of the Greenwich meridian, and the extreme point of east longitude is at Cape Guardafui, $51^{\circ} 15'$ E.

Between these two points the distance is some 4,000 miles, and a line drawn from Cape Verd to Cape Guardafui would pass mainly through the northern portion of the Sudan and south of the desert regions of the Sahara. From north to south, Africa stretches about 5,000 miles between Cape Blanc, on the northern coast of Tunisia, and Cape Agulhas. A line drawn between these two points has to the east of it fully two-thirds of the continent.

3. *Latitude and Longitude of Important Places.* The meridian 31° E. marks an important position on the African continent. Near it is situated the Great Pyramid of Gizeh, a few miles from Cairo, which is exactly oriented, its four sides being directed to the four cardinal points. Moreover, at the point where the pyramids stand, this meridian is intersected by the parallel

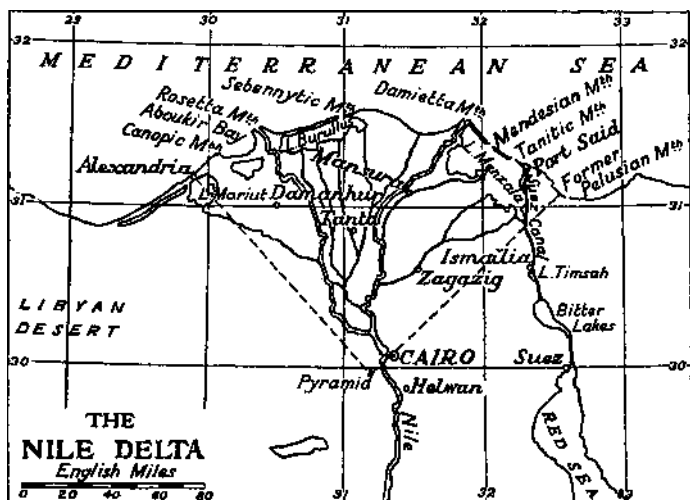


FIG. 1

30° N. These two lines of longitude and latitude approximate closely to positions where there is a greater length of land surface on the globe than on any other degrees, and are not far from the line of latitude ($25^{\circ} 30'$ N.) where the land surface north and south, and the line of longitude (30° E.) where the land surface west and east, are almost equal. For these reasons the pyramids occupy a very remarkable position, and the situation of Cairo may be regarded as almost at the centre of the land surface of the earth.

The meridian 31° E. gives also roughly the course of the Nile and the position of the Great Lakes of Central Africa which lie to the east and west of it; but it does not give the central point which should be adopted in drawing the map of Africa. That point is found where the meridian 25° E. is intersected by the parallel 5° N. Taking this as the centre and bearing in mind the general outline of the continent and the farthest points east and west and north and south, it is fairly easy to draw a map of Africa. The parallel 5° N. gives the general course of the northern coasts of the Gulf of Guinea, the northern limits of the basin of the Congo, and the point on the East African coast whence it tends more directly south-west after changing its general south-easterly direction at Cape Guardafui.

4. *Time.* Owing to the broadening of Africa in the north, the range in time is greater in the northern portion than it is in the southern. When it is noon at Mostaganem in Algeria, and at Accra, in the Gold Coast, both almost on the meridian of Greenwich, it is 11.9 a.m. at Freetown, Sierra Leone, 12.40 p.m. at Tunis, 2.5 p.m. at Cairo, 2.38 p.m. at Mombasa, and 3 p.m. at Berbera in British Somaliland, according to mean solar time at those places. In South Africa, including Rhodesia, South-West Africa, and Mozambique, the mean solar time at 30° E. of Greenwich has been adopted as the standard. This is two hours in advance of Greenwich time and forty-six minutes in advance of mean solar time at Capetown. It is identical with standard time in south-eastern Europe, and has also been adopted as the standard in Egypt and the Anglo-Egyptian Sudan. Thus, although Mozambique (city) and Cape-town keep the same standard time, there is a range of ninety minutes between solar time at the two places. Throughout Libia, French Equatorial Africa, Cameroon*

Angola, and the Belgian Congo, mid-European time (one hour in advance of Greenwich) is the standard. In Algeria and Tunisia, Upper Senegal, Niger Colony, Dahomey, Gold Coast, &c, Greenwich time is the standard. In Senegal, Sierra Leone, and Liberia the standard time is one hour earlier than Greenwich. In Nigeria standard time is half an hour in advance of Greenwich. The Kenya Colony, Abyssinia, and Morocco have not yet adopted the zone system, and keep local time.

5. *Natural Boundaries.* Africa is bounded on the north by the Mediterranean Sea, and extending in a westerly direction approaches the south of Spain very closely at the Straits of Gibraltar, $8\frac{1}{2}$ - miles wide. It then bends southwards in a curve which at Cape Verd reaches its farthest western extension and continues in a south-easterly, and then, from Cape Palmas, in an easterly direction to Cameroons. This portion of Africa is bounded by the North Atlantic Ocean and the Gulf of Guinea. From the neighbourhood of Rio del Rcy, in Cameroons, the coast runs almost due south, veering, however, towards the east from Cape Frio, south of the Cuncnc river. This portion is bounded by the South Atlantic Ocean. From Cape Agulhas the land runs generally east and north-east to Cape Guardafui, and is washed by the Indian Ocean. At Guardafui the coast runs west, and then, at the Straits of Bab-el-Man deb, at the entrance of the Red Sea, north-west to Suez, where the narrow Isthmus of Suez, 80 miles across, divides Africa from Asia. This portion is bounded by the Gulf of Aden and the Red Sea.

6. *Shape.* With the possible exception of Australia, Africa is the most regularly shaped of the continents. There are no large gulfs running into the coasts, few deep indentations worthy of being classed as bays,

except on the south-eastern and eastern coasts, and few bold headlands jutting into the sea. There are, therefore, few peninsulas. None is worthy of being ranked with the great peninsulas of Europe ; the four most important being the Cape Bon peninsula in Tunisia, the Tangier-Ceuta peninsula in Morocco, the Freetown peninsula in Sierra Leone, and the Cape Peninsula, the extreme point of which is the Cape of Good Hope. The Sinai peninsula, although in Egyptian territory, belongs more properly to Asia than to Africa. Such gulfs as exist, as, for instance, the Gulf of Sidra (the ancient Syrtis Major) on the coast of Italian Libia, between the provinces of Tripolitania and Cyrcnaica, the Gulf of Gabcs (the ancient Syrtis Minor), on the coast of Tunisia, and the Gulf of Guinea, are immense open bays of great extent, especially the last. The Gulf of Aden at the entrance to the Red Sea is an extension of the Indian Ocean between Arabia and Somaliland, and the Gulf of Suez and Gulf of Akaba are the northern extensions of the Red Sea.

7. *Coasts.* Although Africa is three times the size of Europe, its coast line is only about 16,000 miles in length, compared with the 20,000 miles of the European coast. This fact and the absence of good harbours within easy distance of each other have exerted a profound influence on the economic development of the continent. Broadly speaking the coasts are low, straight, and sandy, and, although they naturally differ in various parts of so large a continent, their prevailing characteristic is the absence of suitable anchorages for shipping.

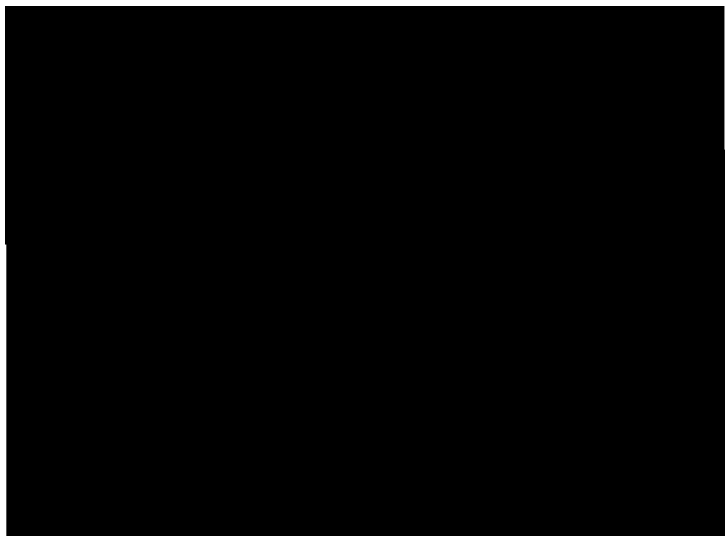
8. *Elevation.* Topographically Africa is divided into two nearly equal parts by a volcanic belt beginning in the Gulf of Guinea and continuing to the Nile (see § 72). North of this line the average elevation of the continent

is from **1,300** to **1,500** ft. above sea-level; south of it the average is from **3,000** to **3,500** ft. Under normal conditions, therefore, the drainage of the continent should be generally from south to north. Broadly speaking, the contrary is the case, although the Nile forms a notable exception. The volcanic belt is marked by the volcanoes in the islands of Anobon, San Thome, Principe, and Fernando Po; the Cameroons mountains and the Highlands of Adamawa; the volcanic hills of Darfur; and the volcanoes on the Bayuda bend of the Nile.

The whole continent may be regarded as a vast plateau or inverted plate, rising by successive stages from sea-level to high elevations in the interior, and forming a series of elevated terraces, each, as an advance is made towards the interior, at a greater height than the other. In this connexion an important fact must be borne in mind, because, as will be shown, it has a bearing on the present topographical configuration of the continent. As the ground rises, often abruptly, from the coast, each terrace has an outer rim higher than the terrace itself in that neighbourhood, through which as a general rule rivers make their way from the interior. A clear understanding of this feature of African topography is of the utmost importance in arriving at a knowledge of the general configuration of the continent and the problems that depend upon it. It has not only had a profound effect in determining the courses of the rivers, but also in hastening the process of desiccation or drying which is one of the chief physical characteristics throughout large portions of Africa (see § 74).

9. *Geographical Zones.* In spite of a certain uniformity of natural features throughout Africa, the northern and southern portions differ in regard to

their main physical conditions, inhabitants, history, and general culture sufficiently to constitute two practically distinct regions. There is, however, no clear line between the two divisions north and south of the volcanic divide, and it may be taken that, generally speaking, the differences in the peoples and languages



I. Gara Krcima, Sahara

are more pronounced than the differences in the physical geography.

For purposes of convenient classification Africa may be divided into nine great geographical divisions. These are (1) the valley of the Nile ; (2) the Sahara Desert region, with its extensions, forming the great barrier between the southern coasts of the Mediterranean and the rest of the continent; (3) the Atlas region in the north-west, occupying much of Morocco, Algeria, and Tunisia ; (4) the Sudan, stretching from Senegal to

the Red Sea; (5) the West African coastal region, extending across the volcanic divide into Cameroons and part of the Gabun colony; (6) the basin of the Congo; (7) the South African plateaus; (8) the East African coastal regions with the high plateaus to the west, extending through Mozambique to Cape Guardafui; and (9) the Abyssinian mountain region. None of these divisions can be precisely defined with the exception of the basin of the Congo, but some, such as the East African region, which is cut off from the Congo basin by a rampart of mountains north of Lake Kivu and between Lakes Edward and Albert, are fairly distinctive by reason of their pronounced natural frontiers, and others, such as the Sudan zone, by reason of the type of vegetation which predominates throughout the region. The Sahara as a natural region can most properly be confined to the purely desert portions of that immense area, although the term is widely extended to include country that is not entirely desert.

10. *Political Boundaries.* Politically the whole of Africa, with three exceptions (Egypt, Abyssinia, Liberia), is divided among six of the European Powers: Great Britain, France, Italy, Spain, Portugal, and Belgium, in the form of colonies, protectorates, and mandated territories.¹ Other European nations which had colonies or settlements in Africa have lost them by conquest (e. g. the former German colonies); barter (c. g. the Danish settlements in West Africa, purchased by Great Britain in 1850); or by a combination of both (e. g.

¹ Although legally there is great difference between Colonies and Protectorates in Africa, there is in reality little practical difference, and the terms are generally used loosely, and without special application. Just as there are many different kinds of colonies, so there are different types of protectorates: but for practical purposes the terms colony and protectorate may be considered to be one, except in the case of Tunisia and a few other places.

Cape Colony, ceded to Great Britain by the Dutch in 1814 after being captured by a British force in 1806) ; or by transfer (e. g. the Dutch settlements in West Africa transferred to Great Britain in 1867). Moreover, the present political divisions do not correspond with those existing at the opening of the nineteenth century, and have undergone profound changes, extensions, and modifications, more especially during the last forty years. The political boundaries frequently do not correspond with the topographical features of the continent, and often depart from the divisions between native peoples. Thus the boundary between Angola and the South-West Africa Protectorate cuts directly across Ovamboland, while the boundary between Dahomey and Nigeria divides closely allied tribes. The best examples of political and topographical boundaries approximately coinciding are the Belgian Congo, which corresponds roughly with the basin of the Congo river, although considerable portions of the basin lie outside the colony ; and Abyssinia, which is mainly a well-defined mountainous region, deprived, however, of its natural coasts.

The other States have either adopted some convenient rivers or lakes as their boundaries, have utilized both river and mountain features, have arranged purely conventional frontiers, or have adopted a combination of all three. Good examples of river and water boundaries are afforded by the Juba river, which divided the Kenya colony (British East Africa) from Italian Somaliland ; the Logone river, which separated Cameroons from French Equatorial Africa; the Orange river, which was adopted as the dividing line between Cape Colony and German South-West Africa; and Lake Tanganyika, which divides the Tanganyika Territory (part of late German East Africa) from the Belgian

Congo.¹ A good example of a mountain boundary is the Ruwenzori range, with Mount Margherita, which was taken as the frontier between Uganda and the Belgian Congo. Good examples of purely conventional boundaries are the boundaries between Egyptian, Italian, and French territory in the Sahara; the southern boundary of Angola; and the eastern boundaries of the former German colony of South-West Africa. These follow meridians or run in straight lines from point to point.

II

POLITICAL DIVISIONS : NORTH AND WEST
AFRICA

11. *Colonies for Europeans.* The countries of Africa may be divided into those having a tropical and those having a sub-tropical climate. These two divisions correspond roughly with those countries which are suitable for European colonization and those in which Europeans can only live for comparatively short periods; or, in other words, with those countries in which there is a considerable European as well as native population, and those in which Europeans are so few as to be negligible so far as population statistics are concerned. The countries suitable for European settlement extend

¹ The former German colonies in Africa are held by Great Britain, France, Belgium, and Portugal as mandatories of the League of Nations. Togoland has been divided between Great Britain and France; Cameroons (Kamerun) between Great Britain and France; and German East Africa, between Belgium, Great Britain, and Portugal, the last receiving a small section of country south of the Rovuma river. German South-West Africa was allotted to the (British) Union of South Africa. All these territories are administered subject to the final authority of the League of Nations.

along the Mediterranean and lie south of the Zambezi, although considerable sections of northern Rhodesia and Katanga, the more elevated regions in Kenya Colony, Tanganyika Territory, and Angola, and certain other favoured regions, are also fit for Europeans to live in. In addition to the native population, large numbers of Europeans are settled in Egypt, Libia (more especially Tripolitania), the Atlas countries, and the Union of South Africa and Rhodesia; smaller numbers in Kenya Colony, Tanganyika Territory, Angola, Mozambique, Nyasaland, and the south-eastern portion of the Belgian Congo; and comparatively few, apart from officials, in the West African colonies, French Equatorial Africa, the Sudan generally, and the rest of the Belgian Congo.

12. *Egypt.* Historically, but not economically, the most important country in Africa is Egypt, the cradle of African civilization. It lies north of latitude 22° N., and therefore almost entirely outside the Tropic of Cancer. Egypt is surrounded on all sides by desert country, and having very little rainfall, depends almost entirely for its fertility upon the flood-waters descending the Nile. If these were cut off or diverted, the marvellously fertile Egyptian soil would become sterile.

Egypt is in the main an agricultural country, irrigated by an extensive system of canals, with industries depending upon the agricultural resources of the country. Some of the irrigation canals, many of which have been in existence since the time of the Pharaohs, are supplied from the permanent flow of the river. The Fayum, a fertile district lying west of the Nile, Lower Egypt, and parts of Upper Egypt, are irrigated in this way; but the rest of the country is dependent upon the flood-waters which are distributed over the soil by means of shallow channels.

Although Egypt appears on the map as a large square block, and covers an area of nearly 400,000 square miles, only about one thirty-third part, or some 12,000 square miles, is available for cultivation. A practically rainless climate restricts agriculture to the districts to which water can be carried, a narrow strip, sometimes above Cairo not much more than a mile in width on both sides of the Nile ; and below Cairo, the fan-like delta of the river. The annual flooding of the Nile occurs in the hottest months of the year, when the tropical rains which have fallen on the highlands of Abyssinia descend the Blue Nile and Atbara, and attain their maximum about the middle of September. The floods of the Blue Nile are met at Khartum, at a little later date, by those descending the White Nile, which have been caused by the rains on the Mufumbiro and Ruwenzori mountains, but the latter are not so important as the Abyssinian floods. At Assuan, where the Nile breaks over a rocky barrier, a great dam, holding back some 2,400,000,000 tons of water, has been erected, and these waters are allowed to escape when the river becomes low. Other barriers have been erected at Assiut, and an enormous reservoir is to be built on the White Nile at Gebel Aulia, just south of Khartum, capable of holding back 10,000,000,000 tons of water, in addition to the barrage being erected near Sennar, which is for purposes of distributing the water locally rather than for regulating the flow of the river. The principal crop upon which the prosperity of Egypt depends is cotton, but numerous others are grown, including maize, millet, and oil-seeds.

Egypt is a kingdom ; but it was until recent years administered by Britain, and the great modern irrigation &nd other works are principally British.

13. *Anglo-Egyptian Sudan.* Attached to Egypt,

though geographically forming part of the Sudan, is the Anglo-Egyptian Sudan, an immense country of diverse conditions, containing some 1,000,000 square miles, and stretching from Wady Haifa, the southern boundary of Egypt, on both sides of the Nile, as far as Uganda and the Belgian Congo ; and from the borders of Wadai, in the west, to the Red Sea,* on the east. It thus lies entirely in the region of the Tropic of Cancer, but the climatic range is much greater than that of Egypt, particularly with regard to rainfall, so that a much greater proportion of the country is available for cultivation.

The most northerly portion; extending from Wady Haifa to Abu Harried, where the Nile suddenly bends south-west as it crosses the Nubian Desert, is entirely rainless ; the middle zone has a rainfall of 4 to 8 in., which is not enough for cultivation ; but south of this area commences the region of tropical rains, which at Roseires, on the Blue Nile, are about 32 in., and increase progressively as Lake Victoria is approached.

Topographically, therefore, the Anglo-Egyptian Sudan is of considerable diversity. In the neighbourhood of the Nile is a fertile strip on both sides of the river, and in the region between the White and Blue Nilcs, which combine to form the main river at Khartum, lies an area of great fertility termed the Gezira. This is a triangular plain sloping gently from east to west, so that it can be irrigated by the natural overflow of the waters of the Blue Nile flowing towards those of the White Nile. To the east of the Nile, below Berber, the country is largely sterile, while the Libyan Desert to the north of the States of Kordofan and Darfur is entirely without water, save for a few oases. Further up the White Nile occurs the immense swampy* area called the Sudd region, where the numerous waterways

become choked with vegetation. Kordofan and Darfur, on the whole, are countries with good pasturage, and in them are ranges of hills, which also occur in the extreme south of the extensive Bahr el-Ghazel province on the borders of the Belgian Congo. Here also is the district known as the Lado enclave,¹ which was at one time leased to the Belgian Congo in order to give that State easy access to the Nile.

Like the population of Egypt, which is increasing very rapidly, that of the Sudan, once considerable, but greatly reduced under the regime of the Mahdi who during the period 1880-84 dominated that region, is also increasing ; but there are enormous areas throughout the whole territory capable of supporting a much larger agricultural population.

14. *Libia*. To the west of Egypt is the Italian colony of Libia,² or Libya, formerly the Turkish provinces of Tripoli and Barca, but now divided into the two provinces of Tripohtania and Cyrenaica. This country extends about 1,100 miles along the Mediterranean from the Bay of Solium on the east to the borders of Tunisia in the west, and stretches south almost to the Tibesti region of the Sahara. In the south-west the country known as Fezzan consists of a huge depression sloping gently towards the east and surrounded, except on the west side, by ranges of hills. Here are numerous oases extending from Ghat in the extreme south-west to Murzuk in the centre. The oasis of Ghadames on the western borders of Tripohtania is on the main caravan routes from Tripoli to the oases of southern Algeria. With the exception of the region around the city of Tripoli, Masurata, and other favoured spots, the

¹ An enclave is a territory enclosed by other territories under foreign rule.

² This is the official Italian spelling.

country generally is arid, and becomes increasingly so as the Libyan Desert is approached. In the eastern province of Cyrenaica narrow terrace-like tracts of country are extremely fertile, and much of Libia is capable of development in the directions of agriculture and forest plantation.

15. *Tunisia.* To the west of Libia is the French Protectorate of Tunisia, extending 550 miles along the Mediterranean and having the advantage of both a northern and eastern littoral. Comparatively small in area (45,000 square miles), Tunisia is a country of great agricultural and mineral value. In the north, where it is largely mountainous, is the fertile valley of the Mejerda, but towards the south the more fertile regions are succeeded by desert steppes, broken midway by a series of shallow lakes and marshes called Shotts, which extend in a line from west to east, and form a barrier both to caravan routes and railway extensions. The chief exports of Tunisia are fruits, olive-oil, grains, alfa, and phosphates.

16, *Algeria.* Algeria lies between Tunisia and Morocco and is a French possession. Algeria proper consists of the country extending from the Mediterranean to about 30° N. ; but south of this there is a vast area forming the Algerian Sahara, and known officially as the Southern Territories. From the coast inland the country consists of three successive zones—the Tell in the north, consisting of ranges of mountains with cultivated lands and fertile valleys, in which the greater part of the population is settled ; the region of steppes, forming a tableland producing fodder for cattle after the rains and enormous quantities of alfa ; and the desert-like and arid regions of the south, with numerous oases, generally scattered in well-defined circles or lying along the dry beds of former waterways. Such a region

is the Wad Rhir, following the valley of the former river Igharghar, which once supported a large population, but is now an arid region. Here artesian wells bring water to the surface.

Algeria has been greatly developed by the French. Like Egypt, it possesses an extensive railway system, which after it had been extended from west to east sent off feeders to the ports on the north and to the oases of the Algerian Sahara in the south. There is a large European population, but the bulk of the people (nearly seven-eighths) are Arabs and Berbers. Large crops of wheat, barley, olives, and grapes (used for wine), and other Mediterranean fruits, are cultivated, while alfa (esparto grass) is a great export from the high plateaus. Iron is abundant, but there is little coal.

17. *Morocco.* Morocco occupies a particularly favoured position in the north-west corner of Africa, both from the commercial and strategical points of view. Although it has a long coastline, extending both along the Mediterranean and the Atlantic, it cannot be regarded as a maritime State,¹ mainly because the majority of the ports, especially those facing the Atlantic, are exposed and afford little protection to shipping. In the main, therefore, Morocco, since the Moorish dominion in Spain which ended five centuries ago, has been a self-contained and self-centred country, and it is only of comparatively recent years that, under French influence, it has been opened to European intercourse. Moorish civilization, once of great benefit to mankind,² has gradually declined, and the Moors, who at one

¹ i.e. in the same sense as Tunis and Algiers, always ports with much local shipping.

² During the Middle Ages the Moors helped to keep alight the lamp of learning that had almost been extinguished in Europe. Their great universities at Marrakesh, Meknez, and Fez produced famous mathematicians and geographers.

period occupied much of Spain, have been restricted very largely to the interior districts of Morocco, while their great cities, Fez, Wazzan, Meknez, and Marrakesh (Morocco City) have decreased in size. Nevertheless, an extensive internal trade in articles of local manufacture, such as leather goods, silks, rugs, and clothing, including the hat known as the fez, has been maintained.

The greater part of Morocco is a French Protectorate, with the exception of a mountainous coastal zone along the shores of the Mediterranean and extending southwards along the Atlantic coast to a little south of Laraiche, which has been allotted to Spain, and an international zone including, and around, the city of Tangier. In the extreme south is another small Spanish territory known as Ifni. Morocco is a country of great agricultural and mineral wealth, capable of considerable development when the railway system, now under construction, is completed. The population, which is mainly Arab and Berber, is estimated at about six millions, and considerable numbers of Europeans have settled in the coastal towns or in their immediate neighbourhoods. The area is about 231,000 square miles.

South of Morocco extends the arid Spanish colony of Rio de Oro, known, with Ifni, as Spanish Sahara, and south of Rio de Oro is the first of the French West African territories, known as Mauritania, and lying north of the Senegal river. This name, strictly speaking, is a misnomer, since it was applied by the Romans to the whole of the north-west portion of Africa, including Morocco and western Algeria; just as the modern name Libia, applied by the Italians to their North African colony, does not represent the ancient Libya of the Greeks or the later Libya of the Romans. The

ancient name Libya was generally applied to the region on the eastern side of the two Syrtes, and the term Africa was confined to the region west of the Syrtes.

18. *French West Africa and the Sahara.* French West Africa forms an enormous, compact territory stretching from the Atlantic coast to the confines of the Anglo-Egyptian Sudan and from the southern borders of Algeria and Morocco to the Gulf of Guinea. Within this area are several separate colonies (Mauritania, Senegal, French Guinea, French Sudan, Upper Volta, Ivory Coast, and Dahomey) under the supreme direction of a Governor-General, whose head-quarters are at Dakar, and it includes the greater part of the Sahara. This great region includes the basin of the Senegal, much of the basin of the Gambia, the basin of the Upper Niger and the Middle Niger, and numerous other rivers falling into the Gulf of Guinea, the pastoral areas of the western and central Sudan, and a great part of the forest belt of western Africa, with a considerable section of the low-lying and swampy coasts. In the north-west is the region formerly known as Senegambia, part of which forms the colony of Senegal and the colony known as Mauritania. The latter has an area of some 344,000 square miles, with a small population. It is in the main an arid country containing a number of fertile oases.

19. *Senegal* has an area of 74,000 square miles, and is the region lying between the Senegal river and the northern frontiers of Portuguese Guinea and completely surrounding the British enclave of the Gambia Colony. The country is in the main sandy, especially in the regions near the coasts, and the rainfall is deficient. Senegal lies at no great height above sea-level. Large quantities of ground-nuts are grown in the region between St. Louis and Dakar.

20. *French Guinea.* To the south of Senegal are Portuguese Guinea and French Guinea. The latter, with an area of 89,000 square miles, embraces the greater part of the Futa Jallon plateau and extends from behind the Portuguese colony to the coast, being bordered on the south and south-east by Sierra Leone, behind which colony it extends to the Ivory Coast Protectorate. French Guinea is a wealthy possession and the source of the principal rivers of this part of western Africa, which radiate in all directions from the Futa Jallon plateau. Behind the coastal belt is a succession of high sandy plateaus, succeeded by the massive mountains of Futa Jallon, which form the western end of the main ridge of western Africa and reach a height of 11,600 ft.

21. *French Sudan.* To the east of Senegal and French Guinea lies the French Sudan (formerly Upper Senegal-Niger Colony), which includes the valley of the Upper Senegal, about two-thirds of the course of the Niger, and much of the country enclosed by the great bend of that river—the region roughly spoken of as the Western Sudan. Northwards the colony reaches the southern limits of the Algerian sphere, and westwards it is succeeded by the Zinder-Chad territory (area, 347,000 square miles ; population, over 1,000,000), and the native states of Kanem, Bagirmi, and Wadai, which have fallen under French domination. The capital, Bamako, is situated on the Niger. Although comparatively little development has taken place, many areas in this vast territory are capable of great agricultural and pastoral expansion, especially those in the more westerly portions of the colony. Towards the east, and north of the Niger, the country becomes less productive, but is still suitable, save in the purely desert regions, for pasture. Communications are mainly by the two railways from the

coast at Dakar and Konakry respectively and by the Senegal and the Niger rivers ; but the tendency of the future will be for produce to find its outlet on the coasts of the Gulf of Guinea. The three Sudan States of Kanem, Bagirmi, and Wadai are attached to French Equatorial Africa. The area of French Sudan is 366,000 square miles, and the population some 2,400,000.

22. *Upper Volta Colony.* Within the great bend of the Niger and north of Dahomey, the Gold Coast, and the Ivory Coast, is the Upper Volta Colony, so called after the river which traverses it before entering the northern territories of the Gold Coast. It has an area of 154,000 square miles and a population of 3,000,000. The capital is at Ouagadougou (Wagadugu).

23. *Ivory Coast.* South of French Guinea is the Ivory Coast, originally meaning what the name implies, a country which yielded ivory when elephants were numerous. They have been killed off, but the country is still a valuable French protectorate, with an area of 126,000 square miles, lying between the Cavalla river, 7° 32' W. longitude, and 3° 6' W. longitude, with a coastline of 280 miles. The interior is mountainous. The Ivory Coast contains valuable forests of commercial timbers, including mahogany, and exports palm-oil, coco-nuts, and rubber. The coast is low and marshy, with extensive navigable lagoons which begin here and extend intermittently to the delta of the Niger. The capital is Bingerville.

24. *Dahomey.* The French colony of Dahomey, to which has been added the greater part of the former German colony of Togoland, lies between Togoland and Nigeria, with the Upper Senegal-Niger Colony on the north, and occupies an area of about 41,000 square miles* The swamps and forest belt of the coastal area, extending about 50 miles inland, are succeeded by

a plateau about 1,650 ft. above sea-level and sloping gently north-east to the Niger. Although the coast of Dahomey is only about 90 miles long (including Togoland), the colony opens northwards to a wide hinterland which as yet is very little developed. A railway from Kotonu is being extended northwards.

25. *British West Africa and Liberia.* British West Africa consists of the four detached colonies and protectorates of the Gambia, Sierra Leone, the Gold Coast, and Nigeria, all of which are completely surrounded, except where they border the sea, by French territory, save Sierra Leone, which is bordered on the south by Liberia. Liberia, which is an independent negro republic, originally founded as a refuge for released and liberated slaves, has an area of 40,000 square miles, but the interior is still largely undeveloped, and is only partly subjected to the central government. Liberia occupies a favoured position on what was formerly called the Grain Coast, between the Manna river on the north-west and the Cavalla river on the south-east, a distance along the coast of about 290 miles ; and it contains about 25,000 square miles of dense uncleared forest. It is a rich country which, when properly developed, will form one of the most productive regions of western Africa. The oil-palm, rubber, coffee, kola nut, and many kinds of fibres, thrive abundantly.

British West Africa is a geographical and not a political term. Contrary to the practice in the French West African territories, each colony is an independent unit responsible to no local central authority, and each follows its own policy subject to the supreme direction of the Colonial Office.

26. *The Gambia Colony.* The Gambia Colony, with an area of 4,500 square miles, is on both sides of the Gambia river from its mouth as far as Bananko ($18^{\circ} 51' N.$

latitude and 13° 52' W. longitude). It was occupied mainly for the purpose of securing control of the estuary of the Gambia. Through the capital at Bathurst, a settlement near the mouth of the Gambia, large quantities of ground-nuts are exported.

27. *Sierra Leone.* Sierra Leone is a compact territory, surrounded by French Guinea, except to the south-east, where it adjoins Liberia. The climate is unhealthy in the coastal districts, though more suitable residence for Europeans is found in the hills on the Sierra Leone peninsula, where is the capital, Freetown. The most fertile districts are in the coastal belt, especially in the Sherbro district, but the inland plateau, seldom above 600 ft. in height, reached by the railway to Pendembu, is also a highly productive region, especially in palm products, ginger, and kola nuts.

28. *The Gold Coast* This colony, originally confined to trading settlements on the coast, now includes Ashanti, formerly an independent native kingdom, and the Northern Territories. It rises gradually from the coast, and is crossed midway from west to east by the Black Volta river. It stretches for 334 miles along the Gulf of Guinea, and has an area of 80,000 square miles. The interior plateau, ranging between 1,600 and 2,200 ft. in height, is a comparatively dry, open, and undulating savannah, suitable for pastoral enterprises. In the coastal regions the oil-palm and cocoa flourish, and form the staple products. In the west, mining is extensively carried on. Attached to the Gold Coast is a small section of the former German colony of Togoland.

29. *Nigeria.* The Colony and Protectorate of Nigeria, which has expanded out of the colony of Lagos and the former Oil Rivers Protectorate in the delta of the Niger, consists of two groups of provinces, northern and southern, now united under one administration. It is

the most densely peopled and, so far as present development is concerned, the richest territory in tropical Africa, and consists of a series of formerly independent and tributary States which have successively fallen



11. Bush path, Upper Mendi Country, Sierra Leone

under British influence. In the north the great Hausa States of Bornu, Sokoto, Kano, Yola, and Zaria, with smaller dependencies of Nupe, Ilorin, Bauchi, and Kontagora, at one time maintained large standing armies, and were the centres of a negro civilization of considerable merit, having large walled cities, trades,

and industries, and extensive agricultural development. In the south-west the Yoruba tribes and the people of Benin had also reached a high state of civilization, and they occupy the most densely peopled districts of Nigeria, the total population of which is estimated at 16,258,000. Less than 3,000 Europeans carry on the administration and external trade of this vast territory of 335,000 square miles—a country as big as the British Isles, France, and Belgium together. On the east the British boundaries have been readjusted so as to include a small portion of the former German colony of Cameroons, including the Rio del Rey, Ambas Bay, and Buea districts.

Through the centre of Nigeria flows the Niger river, which, however, has not been of great importance in the development of the country. Nigeria rises from a coastal belt of lagoons, sand, and alluvium, followed by dense forests of large trees, to a height of about 1,000 ft., which, however, again drops to some 250 ft. where the Niger is crossed at Jcbba by the railway to Kano, and thence again rises gradually to an average height of 2,000 ft., which is nowhere greatly exceeded save in the mountainous districts of Bauchi, Zaria, and Yola, where the Bauchi plateau reaches a height of some 4,000 ft. The whole of the delta of the Niger is a low-lying unhealthy region, gradually rising to about 650 ft. in the neighbourhood of the Udi coalfields.

On the northern plains of Nigeria enormous quantities of ground-nuts are grown, and the pastoral industry, especially in cattle, is rapidly developing. In the forest belt, cocoa and palm products have been greatly developed, while cotton, mainly for native purposes, is extensively grown in many parts of the country.

III

POLITICAL DIVISIONS : CENTRAL, SOUTH,
AND EAST AFRICA

30, *French Equatorial Africa and Cameroons*. The former German Protectorate of Cameroons has been placed under the administration of Great Britain and France, Britain having been put in charge of the districts immediately adjoining Nigeria (§ 29), and France administering the rest of the colony. The area of the country in 1914 was 191,000 square miles, with a native population of some 4,150,000. Cameroons (Kamerun) is situated on the north-west side of the Central African plateau, the eastern portions, which are in the main flat, rising gradually towards the west to mountain ranges running north and south. The north-west portion rises sharply to a grassland plateau with an average elevation of 4,000 ft., and then falls to the level of Lake Chad. The country is well watered by numerous important rivers flowing towards the Atlantic Ocean, Lake Chad, and the Congo basin. The coastal districts are extremely fertile, and numerous vegetable products of great commercial value grow in profusion, especially the oil-palm, cocoa, and bananas. The mangrove swamps of the coast are succeeded by forests of large trees, which are followed by a grassy plateau suitable for cattle.

The French portion of Cameroons now forms a part of French Equatorial Africa, formerly known as French Congo, an immense territory of about 670,000 square miles (exclusive of Cameroons, but including the native States in the north-east, viz. Kanem, Bagirmi, and Wadai). It stretches from the Sahara and the borders of the Anglo-Egyptian Sudan southwards to the

Ubangui river, which forms the northern boundary of the Belgian Congo, and the Congo river itself, and borders the sea from the Cameroons estuary to the small Portuguese territory of Cabinda. For purposes of administration it is divided into three colonies (exclusive of Cameroons)—Gabun (capital Libreville) on the coast, the Middle Congo (capital Brazzaville), and the Ubangui-Shari Colony (capital Bangui); but to the north of the last is the Chad Territory, forming a separate colony between French West Africa and French Equatorial Africa. French Equatorial Africa occupies parts of two important basins, those of the Congo to the south and Lake Chad to the north, but in the western portion of the Gabun Colony are rivers flowing directly to the Atlantic Ocean. The whole area is crossed by important rivers and forms a tropical territory of very great value, as yet almost wholly undeveloped owing mainly, in the past, to the difficulties of communicating with the coasts. It should be noted that the great economic importance of French Equatorial Africa and Cameroons as a tropical territory is increased by the fact that it possesses three distinct river systems, with enormous possibilities of development as waterways.

South of Cameroons lies the small Spanish territory of Rio Muni, forming with the island of Fernando Po and the Corisco and Elobey islands the colony of Spanish Guinea, and south of the Gabun Colony is the smaller Portuguese territory of Cabinda.

31. *Belgian Congo*, formerly known as the Congo Free State, occupies the greater part of the basin of the Congo and opens out from the estuary of that river into an immense territory with an area of 909,000 square miles, or eighteen times the size of England, stretching from the Atlantic Ocean to Lakes Albert, Edward, Kivu, and Tanganyika, and from the Anglo-Egyptian Sudan

on the north to Rhodesia on the south. Attached to this territory is the Ruanda-Urundi Colony, now administered by Belgium, but formerly part of German East Africa.

Physically the Belgian Congo is a low tableland flanked by the higher tableland which forms the rest of south-east Africa, crossed by numerous tributaries of the Congo and traversed by that great river, and extending on the south-east into the higher and highly-mineralized province of Katanga. A great portion of this territory, especially in the north-west, is covered with dense tropical forest, and the whole country is extremely rich in all kinds of tropical products—oil-palm, rubber, cocoa, rice, cotton, and tobacco—and if fully developed should be the richest and most productive portion of tropical Africa. Most of the great rivers are navigable, and when the railway system is further extended they will form in conjunction with it an unrivalled system of internal communications. Boma, the capital, is situated near the mouth of the Congo, and the provincial capitals are Coquilhatville (Equator Province), Stanleyville (Eastern Province), and Elisabethville (Katanga). The most highly developed portion of the Belgian Congo is the Katanga province.

32. *Angola and the South-West Africa Protectorate.* Angola, or Portuguese West Africa, has an area of 510,000 square miles, and extends along the coast for a distance of over 1,300 miles and inland for about 700 miles. In the south-west the country rises rapidly from the coast to an elevated plateau, from 5,000 to 6,000 ft. high, which drops towards Barotseland, the north-west portion of Rhodesia, and may become one of the great pastoral and agricultural centres of Africa. The capital is Sao Paulo de Loanda, a coastal city in the northeast of the colony, and with Mozambique on the opposite

coast, one of the earliest Portuguese settlements in Africa.

South of Angola is the former German Protectorate of South-West Africa, which is now administered by the Union of South Africa, a country rich in minerals, with a sterile coastland, rising to a backbone of mountains running north and south, and extending in the east to the Kalahari Desert. Much of the interior is suitable for pastoral development, but the whole area (322,000 square miles) is in the main unsuited for close agricultural settlement. In the north are the Ovambos, who also extend over the borders of Angola. In the middle are the Hereros, a pastoral people greatly reduced in numbers by their wars with the Germans, and in the south are tribes of Hottentots and Bastards, the last a people of mixed descent. Numerous European settlements occupy the more fertile districts of the interior ; the chief being Windhoek (Windhuk), the capital. The former German port of Swakopmund is being superseded by the neighbouring harbour of Walfish Bay (Walvis Bay), so named because of the large numbers of whales off this coast.

33. *The Union of South Africa* consists of the four provinces of the Transvaal, occupying the high plateau in the north-east, the Orange Free State, a rich pastoral and grazing country south of the Vaal river, the Cape Province in the south, and Natal on the eastern coast. To the north-west of the Cape Province and forming part of it is British Bechuanaland, while north of the latter is the Bechuanaland Protectorate, the northern part of which is occupied by the Kalahari Desert. This protectorate is under direct British administration, as also are Basutoland, the mountainous country of the Basutos, lying between the Cape Province, Natal, and the Orange Free State, and Swaziland, occupying a district south-east of the Transvaal.

Generally speaking, the whole of the territory lying west of the railway from Cape Town to Buluwayo is either arid or only fit for pastoral enterprises, while the territory to the east becomes more fertile, especially as the coastal districts of the Cape Province and Natal are reached. The bulk of the population, both native and European, is concentrated, therefore, to the east of this railway, and is almost entirely dependent upon it and the numerous railways to the east of it for commercial transport.

The native population of the South African Union is about 5,000,000, and there are in addition about 1,300,000 persons of European descent, divided into two almost equal sections, British and Dutch (or Boers). The latter are in the main agriculturists and pastoralists, and are descended from the Dutch and French Huguenot settlers of the seventeenth and eighteenth centuries. They are settled throughout the interior districts of the Cape Province, and in the Orange Free State and Transvaal, chiefly in the country districts and the smaller towns.

The Union of South Africa has three capitals—Cape Town, the seat of the Parliament ; Pretoria (Transvaal), the administrative centre ; and Bloemfontein (Orange Free State), the seat of the Supreme Court. Pietermaritzburg is the capital of Natal. The largest province is the Cape Province, with an area of 276,000 square miles, followed by the Transvaal, 110,000 square miles, the Orange Free State, 50,000 square miles, and Natal, 35,000 square miles.

34. *The Cape Province* consists of a series of elevated plateaus, known as the Little Karroo, Great Karroo, and northern plains, rising from a narrow coastal belt into the plateau known generally as the High Veld (sec 67). These plateaus are divided from each other by

ranges of mountains running mainly from north-east to south-west, higher in the eastern districts than in the western.

This plateau formation does not favour the use of the rivers for transport, and the terrace-like formation of the country also made the construction of railways difficult. In the early days of European settlement (1652-1795) progress northward from Cape Town was slow and laborious, and proceeded by way of the mountain passes ; the main avenue of advance, when once the mountains beyond Cape Town had been passed, being over the Great Karroo in the direction of Graaf Reinet. At a later period (1820), when Port Elizabeth was used as a port of immigration, an advance was made into the eastern districts, but the presence of hostile Kafir tribes retarded settlement. The development of the northern districts of the Cape Province and the rest of South Africa was due to three causes : (1) political discontent on the part of the Boers, which urged them forward to new and undeveloped districts, (2) the discovery of diamonds at Kimberley, and (3) the discovery of gold on the Witwatersrand.

With the exception of the beautiful and fertile districts around Cape Town, the western parts of the Cape Province are dry and arid and mainly suitable for pasture only. Hence agricultural development is largely concentrated in the coastal regions of the south and in the more easterly districts of the interior. In the extreme east, in the old province of Kaffraria and the present Transkeian or Native Territories, there is much fertile land under cultivation and available for cultivation, but these territories are very largely reserved for the Kafir tribes who are settled in them. They consist of Fingoland, Galekaland, Tembuland (including Bomvanaland), Griqualand East, and Pondoland, the two latter bordering

upon Natal, and have a population of about 20,000 whites and over 900,000 natives. To the north of the Orange River is Griqualand West, in which is Kimberley, and above this the district known as British Bechuanaland forms a continuation of the northern plains which in the Bechuanaland Protectorate, farther north, attain a height of 4,000 ft. to 6,000 ft. West of Griqualand West and south of the Orange River lies the arid area known as Great Bushmanland ; and farther west, bordering the Atlantic coast, is Namaqualand, which beyond the Orange River, in the South-West Africa Protectorate, is known as Great Namaqualand.

35. *Orange Free State.* To the north-east of the Cape Province, across the Orange River and separated from Natal by the barrier of the Drakensberg and the mountains of Basutoland, is the broad plateau of the Orange Free State, some 4,000 ft. to 5,000 ft. above sea-level. Here the rainfall is moderate, but by means of irrigation much is being done to render the province more suitable for agriculture. The country as a whole is well suited for pastoral industries.

36, *Natal.* The Province of Natal lies along the Indian Ocean and rises from the sea in a confused succession of hills and ridges, enclosing many valleys in which tea, sugar, and other tropical products are successfully grown. The rise from the coast is extremely steep, and Pietermaritzburg, only 40 miles in a direct line from the sea, is over 2,000 ft. above sea-level. The climate of Natal and the fertility of the valleys render the country one of the richest agricultural districts of the Union. To the north-east and forming part of the province is Zululand, with a comparatively dense native population, while to the north of Zululand and lying between Swaziland and the coast is Amatongaland, also part of Natal, a low-lying and somewhat unhealthy country,

which also extends on the other side of the Portugues border towards Delagoa Bay.

37. *Transvaal*. The Transvaal, as its name implies, lies 'beyond' or north of, the Vaal river, and between that river and the Limpopo. The western and southern districts form part of the South African plateau, but to the east the ground falls steadily towards Gazaland and



III. Upper Rapids, Umkomaas River, Natal

the low-lying coastal regions of Portuguese East Africa. The northern districts of Waterberg, Zoutpansberg, and Lydenburg, where the ground falls to the valleys of the Limpopo and its tributary the Sabi, from their lower elevation are more tropical and less healthy than the high plateau of the south. The whole of the Transvaal is rich in minerals, and in many parts of the country agricultural and pastoral industries flourish, more especially in the southerly districts. Pretoria, the

capital, and Johannesburg, the industrial centre, are both important cities.

38. *The three South African Protectorates.* Geographically part of South Africa, but politically distinct from the Union, are three protectorates over which the Imperial Government, owing to treaties with the natives and because of their large native population, has retained administrative control. These are the Bechuanaland Protectorate, Basutoland, and Swaziland. The area of the first is about 275,000 square miles, and it is in the main a country of deficient rainfall, suitable only for pastoral pursuits, and in the north extending into a desert region known as the Kalahari. The second is a mountainous country, with an area of 11,716 square miles, and an excellent climate, but containing not much land suitable for agriculture. The third, with an area of 6,536 square miles, consists of a high-lying, pastoral, and well-watered country in the west, which descends to lowlands in the east. Considerable agricultural development has taken place.

39. *Rhodesia and Nyasaland.* North of the Transvaal and the Bechuanaland Protectorate is Rhodesia, which occupies much of the basins of the Zambezi and Limpopo rivers and forms an extension of the South African plateau. It is divided into two sections—Southern Rhodesia, lying south of the Zambezi, and Northern Rhodesia, lying north of the Zambezi, the one in the main suitable for European settlement, the other a more tropical country, with a climate more like that of Central Africa generally. Until recently both were under the administration of the British South Africa Company, but in 1923 Southern Rhodesia was granted a Constitution of its own. Southern Rhodesia, which includes Mashonaland and Matabeleland, is mainly a pastoral area, with many regions suitable for agriculture

and fruit-growing, and containing much mineral wealth. Northern Rhodesia, which includes Barotseland in the north-east, is traversed by numerous affluents of the Zambezi. The total area of Rhodesia is about 440,000 square miles, with a native population of 1,614,000 and about 25,000 European settlers.

The Nyasaland Protectorate, lying west and south of Lake Nyasa, occupies the eastern highlands of the South African plateau, and has an area of 39,000 square miles, with 1,137,000 native inhabitants. It is a fine agricultural country capable of growing numerous valuable tropical products.

40. *Mozambique*, or Portuguese East Africa, lies along the Indian Ocean from the northern boundaries of Zululand to the Rovuma river, and has a coastline of about 1,400 miles, with a breadth varying from about 30 miles at Delagoa Bay to about 500 miles from the delta of the Zambezi to the Rhodesian frontier at Feira and Zumbo. The coastal districts are suitable for tropical planting enterprises, especially sugar. Farther inland more purely agricultural industries (maize cultivation especially) are undertaken; but a great part of the country is either undeveloped or, as in the Tete and other districts, not suited for agriculture. Pastoral enterprises, owing to the prevalence of the tsetse-fly (see § 214) over large areas, are also impossible over considerable sections of the country. •

Politically Mozambique is divided into three provinces: the Tete, Quelimane, and Mozambique districts in the centre, and the Lourenco Marques, Gaza, and Inhambane districts in the south, under the direct administration of the Governor-General; the Mozambique Company's Territory lying south of the Zambezi river; and the Nyassa Company's Territory lying north of the district of Mozambique. The total area of

Portuguese East Africa is about 271,000 square miles, and the native population is estimated at 2,600,000, but may be much more.

41. *Tanganyika Territory.* The country formerly known as German East Africa has been divided between Belgium and Great Britain (with a small portion in the extreme south allotted to Portugal) as mandatories of the League of Nations. The portion administered by Great Britain is known as Tanganyika Territory, and extends from Lake Tanganyika on the west to the Indian Ocean on the east, and from Lake Nyasa on the south to Lake Victoria on the north. The estimated area of the whole of German East Africa was 384,000 square miles, with a native population of 7,500,000, but half of these were settled in the north-western countries of Ruanda and Urundi, which are now administered by Belgium as the Ruanda-Urundi Colony. Ruanda is situated to the east of Lake Kivu and is a rich agricultural and pastoral country* traversed by the Kagera and its tributaries and bordered in the north-west by the Mufumbiro Mountains. South of Ruanda and extending along the east shore of Lake Tanganyika is Urundi.

Although certain portions of the Tanganyika Territory lie at an elevation of some 6,000 ft. above sea-level, the height of the interior plateau generally does not exceed 3,000 ft., and consequently there are few fine pasture-lands like those of the high parts of Kenya Colony. Considerable portions of the central plateau between Morogoro and Tabora are sterile, and a similar district extends to the south-west of Tabora. In the coastal districts and around Mount Kilimanjaro plantation industries on a large scale have been established.

42. *Kenya Colony*, formerly known as British East Africa or the East Africa Protectorate, lies between Lake Victoria and the Indian Ocean and covers an

estimated area of 246,000 square miles. It rises from a low and tropical coastal area to an elevated plateau, reaching in places a height of more than 8,000 ft., and consequently there is a considerable range in the nature of its products and also a difference in the value of the various parts of the country for European settlement. In the highlands, cereals, especially maize, are the standard crops, but in the lowlands, both on the sea-shore and on the shores of Lake Victoria, cultivation ranges from the coco-palm and pineapple to cotton, sisal hemp, and rubber. European settlement is mainly along the Uganda Railway or in its neighbourhood, but large numbers of agriculturists have settled on the Uasin Gishu plateau, in the north-west of the colony. Enormous herds of big game are still found throughout the country. To the west of Nairobi, the capital, the Masai occupy the rolling grass-lands, on which they feed large herds of cattle. The northern portions of the Kenya Colony, especially as Lake Rudolph is approached, are arid, while Tanaland and Jubaland in the north-east are also deficient in rainfall, but have great possibilities for irrigation. The coastal districts of East Africa from Somaliland to Mozambique were formerly under the Sultan of the neighbouring island of Zanzibar, and a portion of Kenya is still known as the Kenya Protectorate.

43. *Uganda.* The British Protectorate of Uganda occupies the region north of Lake Victoria and between that lake and Lakes Albert and Edward. Although situated on the Equator, the climate, though not healthy, is not unpleasant, especially in the higher regions between Lakes Victoria and Albert. Towards the Nile valley, and around Lake Kioga, the country is low, and does not much exceed 2,000 ft. above sea-level. The area of the Protectorate is 109,000 square miles. The natives are

among the most intelligent of the African peoples, and their country was formerly divided into flourishing independent kingdoms, which still retain their boundaries and much of their independence. The principal of these kingdoms are Buganda¹ (Uganda proper), Bunyoro, Ankole, and Toro.

44. *Abyssinia and the Horn of Africa.* The elevated country of Abyssinia, which occupies the highlands of north-east Africa, has an area of 350,000 square miles, and is one of the three independent native territories on the continent. It is divided into several provinces, which were formerly kingdoms more or less dependent upon the central government of Shoa, such as Harar, Tigre, and Gondar (Amhara), and the native population is estimated at over eight millions, mainly of Semitic origin and consisting of Gallas and Somalis in the south and south-west, and Shoans, Tigrians, and Dankalis in the east. Abyssinia is officially known as Ethiopia, and the inhabitants preserve a debased form of Christianity learned from the Christian missions of the pre-Mohammedan period.

To the east of Abyssinia, the country of the Somalis, in the main a sandy and somewhat arid region, borders the coasts of the Gulf of Aden and the Indian Ocean as far south as the Juba river. It is divided into Italian Somaliland in the south, and British Somaliland in the north. To the north of British Somaliland at the entrance to the Red Sea is the small territory of French Somaliland, including the Sultanate of Obok and the valuable port of Jibuti, which forms the main entrance to Abyssinia ; and north of French Somaliland and stretching

¹ The correct form of Uganda is Buganda ; the people are known collectively as Baganda, the individual as a Muganda, and the language as Lugando. Similar changes occur in many African languages,¹ and words are commonly modified by prefixes or the change of initial letters.

along the Red Sea as far as the Tokar district of the Anglo-Egyptian Sudan is the Italian colony of Eritrea, with a coastline of 671 miles, and a population, like that of considerable portions of Somaliland, largely nomadic. The scarcity of water here and in Somaliland generally necessitates works for irrigation before crops can be raised with success, but pasture is abundant and the country is suited for cattle, sheep, camels, and goats.

IV

EXTERIOR RELATIONS AND COASTS

45. *Relations with other Continents.* Geographically Africa may be considered as a southern extension of Europe and Asia, separated as it is from the former by the comparatively narrow basin of the Mediterranean and from the latter by the narrower trough of the Red Sea. The relations between the shores of the Mediterranean, within historical times, have always been close, and it is probable that in the prehistoric ages similar conditions of intercourse existed. Recent excavations in Crete and the discovery of a pre-Hellenic civilization, known as the Minoan, support the idea of considerable maritime intercourse across the narrow sea.

46. *The Mediterranean Basin.* The Mediterranean has been, therefore, a connecting link between Europe, Asia, and Africa; and though the great migratory movements have been by land, there has been a commercial intercourse by sea. Similarity of climate and of general conditions have resulted in the essential unity of the Mediterranean countries; the narrow fringe of special Mediterranean conditions extending along a great part of the northern coasts of Africa and facilitating intercourse.

47. *The Saharan barrier.* Intercourse was confined, however, almost exclusively to this fringe of Mediterranean territory, the great desert mass of the Sahara forming an almost insuperable barrier, and practically shutting off the rest of Africa from the Mediterranean regions. Evidences of the existence of a large mass of land which extended towards South America, or at least with its continental islands formed a connecting link between America and Africa, are at present too slight to need special mention here. The existence of the so-called Lost Atlantis has yet to be proved.

48. *Connexion with Asia.* The only land connexion between Africa and Asia is the isthmus of Suez, a narrow strip only some 80 miles wide, once dividing the Mediterranean from the Red Sea, but now pierced by the Suez Canal, which forms the great commercial highway from Europe to the East. Although the frontier of Egypt is well to the east of the isthmus of Suez, and Africa therefore extends beyond the Suez Canal, that channel can conveniently be considered as the boundary between the two continents.

In the early period of African history, however, Egypt was generally regarded as part of Asia, largely owing to the fact that its relations were in the main with Syria, Palestine, and Arabia, and that the rest of the continent remained an unknown land, shut off from the early Egyptian civilization by vast barriers of desert sand, which effectually stopped commercial intercourse with the barbarian tribes to the south of the deserts. It was only as the Phoenicians and their off-shoot the Carthaginians settled along the coasts of northern Africa and took to navigation beyond the Pillars of Hercules, and as the Egyptians, who were never great navigators, ventured down the Red Sea and possibly along the coasts of eastern Africa, that it began to be realized

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that Africa was an immense continent stretching for an unknown distance towards the south.

49. *Factors retarding Development* Knowledge of the continent was gradually extended by the voyages of the Phoenicians down the western coasts, and probably right round the continent, but so late as the year 200 B.C. Africa was regarded as a comparatively small territory almost surrounded by the ocean and extending southwards to Abyssinia and the eastern horn of the continent. It was not until the voyages of the Portuguese in the fourteenth and fifteenth centuries had revealed the full extent of the continent that it was realized how vast Africa really is. But although the coasts were thus discovered, four hundred years passed before much was known of the interior, and the chief reasons for this slow acquisition of knowledge—slow when compared with the rapidity with which the Americas were penetrated—may be summarized as follows: (1) an inhospitable coast, ill-provided with harbours, frequently consisting of desert sands or of dense mangrove swamps; (2) a succession of dense tropical forests behind the coastal lands; (3) the presence of hostile tribes, well equipped for purposes of warfare; (4) a climate, and diseases, such as malaria, particularly deadly to Europeans, who were then unacquainted with the principles of tropical hygiene; (5) the absence of good natural routes towards the interior; and (6) the fact that commerce between different African nations was practically non-existent, each tribe being hostile to its nearest neighbours, and few large confederations or alliances of tribes then existing. Where such did exist, as in Monomatapa, which covered a considerable area in south central Africa (Mashonaland, Matabeleland, Manicaland, &c), discovery from the coastal districts inland was facilitated.

Where no great confederations existed, as in the Congo regions, discovery was retarded.

50. *Surface Features and Communication.* In the development of Africa there is no more important consideration than that of communications. From the historical and economic standpoints, therefore, it is of the utmost importance that the student should have a clear idea of the topographical features of the continent in order to understand what factors have hindered the economic development of Africa and what natural features will aid the work of making the resources available for the use of mankind. The four principal factors that have hindered development are deserts, mountains, swamps, and forests (see § 49). The principal features that have aided development are rivers, lakes, and plains.

51 • *Geological Considerations.* Geologically Africa is one of the oldest of the continents. This may be illustrated by reference to a map showing the configuration of the sea-floor from which the continent rises. Between the coastline and the line (for example) of 1,000 fathoms' depth there is the similarity in outline that might be expected where the coastline has been fashioned into a more or less regular shape during countless ages by the detritus or soil brought down the great rivers which have filled up the coastal indentations with the debris of the interior highlands. The 1,000-fathom line traces a curve which follows closely the general contours of the land. This fact, taken in conjunction with the regular line of the coast, the absence of great gulfs and inlets, and the presence of huge deltas at the mouths of the rivers, such as those of the Nile, Niger, and Zambezi, indicate that during a prolonged period the rivers of Africa have been moulding the coasts into an even and regular shape. The absence of a delta at

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the mouth of the Congo is due to the fact that that river enters the sea not far below a series of gorges, probably cut in comparatively recent times, through a high coastal range.

52. *Nature of Rocks.* The greater part of the surface of Africa is composed of the older rocks, limestones and sandstones, and other formations of the Palaeozoic age, with granites, gneisses, and crystalline rocks ; and during the Devonian period large parts of the continent that are now elevated regions, such as the Great Karroo in South Africa, and considerable portions that are fairly low-lying, such as Jubaland on the east coast of Africa and the basin of the Congo, were under water and formed vast inland seas connected, possibly, with the great oceans. Africa as a whole has undergone a continuous process of elevation, except in the region known as the Rift Valley. Volcanic and seismic action has played an important part in the topography of the continent, and violent changes have completely transformed immense areas. Before dealing with this question, attention should be devoted to the existing orographical features of Africa.

53. *Height of Land.* In contrast with other continents Africa is noteworthy for the comparatively small area both of very high and of very low ground. The area of land over 10,000 ft. in height is insignificant, and is represented almost entirely by isolated peaks and mountain ranges. The heights of the mountains are inferior to those of Asia and South America, and there is no great succession of lofty chains such as exist in the Indian Himalayas, on the plateau of Tibet, the Pamir, or the Andes. On the other hand, the area of land under 600 ft. in height is unusually small, and is almost exclusively confined to the coastal zone and portions of the Sahara. The characteristic feature of Africa, there-

fore, is the elevated tablelands broken by higher peaks and ridges. As a general rule the higher tablelands lie towards the east and south (§ 57).

54, *Coasts*. The coasts of Africa have not been physically favourable for the development of commerce by sea. In the Mediterranean age, when the Mediterranean represented the commercial maritime focus of the then known world, commerce did not flow easily and naturally to and from the North African coasts, which lacked those natural facilities for shipping that rendered the Grecian States the commercial centres of the ancient world. Commerce then passed more easily from east to west than from north to south.

After the Phoenicians spread along the coast of Palestine and began to trade along the Syrian coasts, they passed far along the North African littoral before they established themselves at suitable spots on the mainland. Finally they founded a great commercial city at Carthage, where they subsequently disputed with the Romans the maritime supremacy of the western Mediterranean.

The coasts of northern Africa are either low and sandy or rocky and precipitous, the former type predominating in Egypt and Libia ; the latter in Morocco and Algeria. With the exception of the Nile no great waterway leads into the interior, and there is an almost total absence of bays, gulfs, and inlets, such as rendered the coasts of Greece and Asia Minor ideal for shipping in early times.

The West African coasts generally are low and sandy, immense stretches in the north-west being without natural harbours, and most of the existing river mouths being blocked by bars, and thus unsuitable for commerce. Elsewhere these coasts are swampy and covered with mangrove forests. Some excellent natural ports, such as the estuary of the Gambia, Freetown, the Cameroons

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estuary, the large estuaries at Libreville and Cap Lopez, the estuary of the Congo, and Lobito Bay, are of great value or possible value to sea commerce ; but generally where ports exist, especially on the coasts of Upper Guinea, they are open roadsteads affording little protection to shipping. Farther south the coast as far as Saldanha Bay in the Cape Province has no good natural harbours, with the exception of Walfish Bay, and it is moreover low and sandy, and backed by an arid hinterland. Saldanha Bay itself, although an excellent harbour, was for long practically useless because it lacked a good water-supply.

From this point the nature of the coast changes. The coastal mountains frequently approach close to the sea, and consequently the coasts rise steeply ; but with the exception of Table Bay, which, however, is exposed to boisterous winds, there is an absence of good harbours until Delagoa Bay is reached. Engineering improvements have rendered certain harbours suitable for modern shipping, but generally the whole South African coast was avoided in the days of sailing ships because there was no adequate shelter from the prevailing winds. In the earlier days Portuguese vessels preferred passing Table Bay rather than risk shipwreck on the inhospitable coasts. Algoa Bay, on which stands Port Elizabeth, is an open roadstead, subject to violent storms ; but the Buffalo River, with its Port of East London, and Port Natal, on which is Durban, can now be entered by large vessels. Delagoa Bay is a magnificent land-locked harbour—the first of a number which occur along the East African coasts and continue northward as far as Mombasa.

Unfortunately on the coast of Mozambique (Portuguese East Africa) at the point where a good harbour is most needed as an opening for the commerce of Rhodesia

between Inhambane and Quelimane, the coast is very low with swamps behind it and shoals and coral reefs in front. The harbour behind the island of Mozambique has long been an important anchorage ; and a few miles south is the fine harbour of Mocambo Bay. Northward along the coast are Conducia Bay, Fernando Velloso Bay, Memba Bay, and Pemba Bay ; all fine natural harbours, but of little commercial use at present as they lack railway communication with the interior. In Tanganyika Territory the great harbour of Kiiwa Kivinje is one of the finest anchorages on the coast, and farther north Dar-es-Salaam and Tanga are two excellent harbours, both rendered commercially prosperous by railway communication. Kilindini, the coastal terminus of the Uganda Railway, is a good harbour, close to Mombasa ; but thence northward the coasts are low and sandy, and possess only one good harbour at Jibuti, near the entrance to the Red Sea.

There are few islands near the north and west coasts. The Azores, Madeira, Canaries, and Cape Verd islands lie at a considerable distance from the north-west coast. Fernando Po, lying off the Cameroons estuary, commands this portion of the West African coast and forms the last of a string of islands (Annobon, San Thome, and Principe) which appear to be the summits of a submerged mountain range extending on the mainland north-eastwards into Adamawa (see § 72).

On the East African coast there are numerous small and some large islands, such as Mozambique, Ibo, Mafia, Zanzibar, Pemba, and Mombasa, while off the coast of Mozambique (Portuguese East Africa) is the great island of Madagascar, separated from Africa by the Mozambique Channel.

V

SURFACE FEATURES : MOUNTAINS AND
PLATEAUS ; DESERTS

55. *Coastal Relief.* The continent rises in successive terraces from the coast, and the relief of the land may be considered in four divisions : (1) the coastal plains, (2) the Atlas range, (3) the southern and eastern plateaus, and (4) the north and west African plains.

The coastal zone is frequently composed of raised coral rocks, covered with sand dunes, as is the case generally in eastern Africa, or is a level sandy area with a succession of dunes, as on the south-western coasts, or is fringed by mangrove swamps, especially in the estuaries of rivers and on alluvial flats, as along the Gulf of Guinea and certain parts of the coast of Mozambique, and in other districts. The coastal lowlands frequently form the first steps of the system of terraces, especially along the coasts of South Africa, where the terraced mountains rise almost from the sea. From Cape Bon until about 500 miles beyond Ceuta the coast is also steep, and in the neighbourhood of Solium and on both sides of that place the Libyan plateau descends abruptly to the sea.

56. *The Atlas Region.* The Atlas region is orographically distinct from the rest of Africa. It is unconnected with the mountain systems of the rest of the continent, and is separated from them by the depressed desert area of the Sahara (see § 75). The Atlas is not properly a mountain chain, but consists of many distinct ranges running generally north-eastward from Cape Nun in Morocco, opposite the Canary Islajids, to Cape Bon, a distance of some 1,400 miles. It is roughly divided

into two main chains. These two main chains are known as the Maritime Atlas, which includes the ranges overlooking the Mediterranean from Ceuta to Cape Bon and numerous subsidiary ranges frequently terminating on the coasts ; and the inner and more elevated ranges which run more or less parallel with the first and are divided from them by high plateaus.

These inner ranges attain their greatest elevation in Morocco, and can be divided into three important sections : (1) the Great Atlas, which is the backbone of the system, (2) the Middle Atlas, and (3) the Anti-Atlas, or Jebel Sagheru, which stands nearest to the Sahara. These southern or inner ranges extend into Algeria, where they are known collectively as the Saharan Atlas, and although forming in reality one chain, are called by different names, such as Jebel Ksur, Jebel Amur, the Zab Mountains, and Jebel Aures.

The Maritime Atlas, which is much more broken than the inner ranges, includes the mountainous region of the Rif in the Spanish portion of Morocco, a wild and lawless country, only partly pacified by the Spaniards, and it terminates at the Straits of Gibraltar, where it forms the promontory between Ceuta and Tangier. Eastward the ranges extend throughout the northern portions of Algeria and Tunisia, where they are divided into five principal groups, including the Jurjura and Mejerda ranges. The former occupies the region known as the Grand Kabylie. The latter lies to the east of Constantine and to the south of the fertile districts known as the Tell, or Little Kabylie. Between the Maritime Atlas and the inner ranges lie the great elevated plateaus of Algeria.

The Great Atlas in Morocco is seldom under 10,000 ft. in height, and its principal peak, the Tinzar (Tizi n' Tagharat) is estimated to be 15,000 ft. high. There

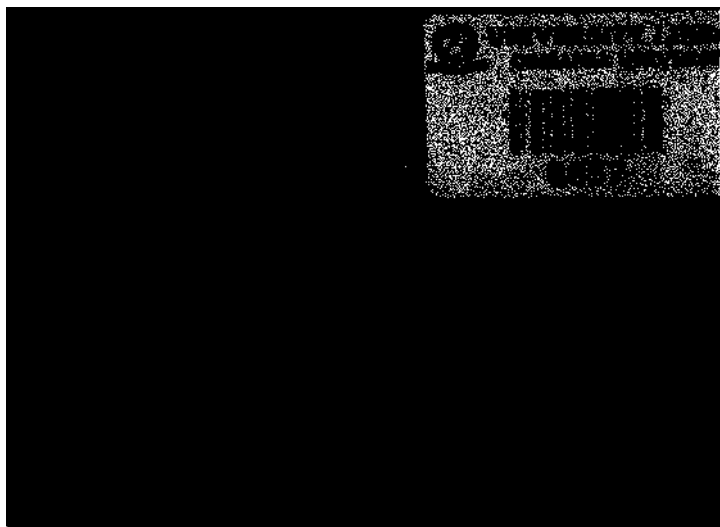
are mountain passes as high as the frequented passes of the Swiss Alps. The highest peak in Algeria is the Jebel Shellia in the Zab range, 7,611 ft. high, and the highest peak in the Maritime Atlas is Lalla Kedija, 7,542 ft., in the Jurjura. The Atlas ranges are pierced by many wild gorges. That of El Kantara, traversed by the railway to Biskra, is called by the Arabs the Fum es-Sahara (Mouth of the Sahara) and forms an important route to Tuggurt and the southern oases.

The Atlas ranges are of great importance because they form the connecting link between Europe and Africa. On the northern slopes there is an abundant rainfall, and the vegetation is mainly European in character. To the south of the ranges begins what may be regarded as Africa proper. Climatically the region is one of extremes, for in the higher Atlas there are Alpine conditions, with pastures lower down, and forests of oak, cypress, and chestnut, while on the plains nearer the sea the conditions are generally arid.

57. *The Southern and Eastern Plateaus.* The high southern and eastern plateaus of Africa rarely fall below 2,000 ft. in height. They are one great and closely connected system stretching from the shores of the Red Sea to Table Mountain, and form the backbone of the African continent. They can be divided into three main sections: (a) the Abyssinian highlands, (b) the East African plateau, and (c) the South African plateau, each with their superimposed ranges of mountains.

58. *The Abyssinian Highlands* rise abruptly on the east and fall more gradually on the west, and form a confused mountainous mass built up in the main by volcanic action, and cut by many deep gorges and wide valleys. The Abyssinian region may be divided into four distinct zones: (1) the maritime plains occupied by the European

powers and extending through Eritrea and French Somaliland to Cape Guardafui, and then widening into the expanse of Abyssinian Somaliland and extending into Jubaland ; (2) the maritime ranges running generally parallel with the coast and continuing northwards along the coast of the Red Sea ; (3) the raised undulating plateaus which terminate in the Harar highlands and!



IV. South African Plateau : Modder River near Bloemfontein

are continued southwards into the hilly country, which forms the basin of the Webi- Shebeli and the Juba river, as far as Lakes Rudolph and Stephanie, in the form of more or less isolated mountain peaks ; and (4) the region bordering the Anglo-Egyptian Sudan, a district mainly mountainous and intersected by numerous deep ravines, some of which are 4,000 ft. in depth. The main characteristic of the Abyssinian mountains is their rugged and precipitous nature, and in this respect they *form

a contrast to the general character of the mountain system in South Africa.

* The eastern wall of the interior highlands runs due south until it reaches the valley of the Hawash, whence



V. Bamboo Forest, East Africa

it bends south-west, with another chain continuing in the first general direction. From this the Harar range runs east towards the Gulf of Aden. Abyssinia contains some lofty peaks, many of which are snow-capped. The summit of Ras Daschan, in the Semien range, reaches a height of 15,100 ft. It stands north-east of Lake Tsana, which occupies a depressed region at a height

of 5,750 ft. above sea-level, and from which the Blue Nile issues in a deep valley between the highlands. The circular form of this lake suggests that it was the crater of a huge volcano. The lake is full of hippopotami, and is the highest recorded water in which they are found. Most of the heights, however, are crowned with open plateaus, broken by jungle-choked gorges or canyons which form formidable obstacles to communication. For this reason the bulk of the population lives on the plateaus, along which, and not along the valleys, run the main lines of communication. Owing to its elevated situation, the climate of Abyssinia as a whole more nearly resembles that of southern Europe than that of the surrounding plains, and the whole of this great area, although forming a northern extension of the main African mountain systems, is really a distinct region surrounded on all sides by low-lying plains extending on the north-west, east, and south-east into arid regions, and on the west into the Sudd regions of the Nile. Many of the inhabited plateaus are at a height of 9,000 ft., and bear the usual European crops, while the heights above 9,000 ft. have magnificent pasturage for sheep and cattle.

59. *The East African Plateau* is formed by a widening of the high ground which is the axis of the continent, and is divided into a number of belts running north and south, consisting of ranges, tablelands, and depressions. In many respects this region is the most interesting in Africa. It was the latest to be discovered and explored ; it contains the headwaters of the Nile, and also feeds the Congo and the Zambezi, as well as numerous rivers running into the Indian Ocean ; it is traversed by great mountain ranges, including active volcanoes, long only heard of by rumour ; it contains a series of enormous fresh-water lakes and numerous smaller ones ; and

geologically it is of surpassing interest by reason of the tremendous changes it has undergone through the action of earthquakes and volcanoes.

As is the case with other parts of Africa, the coast rises in successive stages towards the interior, but in East Africa this more or less regular progression is broken by two large valleys or troughs running from north to south. Before the present system of mountains was formed there existed a great chain extending from the north of Lake Nyasa to the mountains of Abyssinia, with a second range beginning on the Nyasa-Tanganyika plateau, and continuing in the same general direction more or less parallel with the first. Between these two ranges lay an area of internal drainage. At some remote period there was an enormous subsidence, and what are now known as the Rift Valleys were formed as two lines of depression, the lowest parts being occupied by the Great Lakes. These two lines converge at a point north of the Abercorn portion of the Tanganyika plateau, and at Lake Nyasa they form one valley occupied by that lake ; but farther north the western depression, known as the Albertine Rift Valley or Central African trough, is occupied by the four great lakes of Tanganyika, with its comparatively high and straight shores, Kivu, Edward, and Albert, and terminates north of the last lake and south of the Nile. The eastern valley runs across Tanganyika Territory and Kenya Colony to the east of Lake Victoria, and is continued through Lake Rudolph and south of the Abyssinian highlands, where it turns north-east to the Red Sea, which forms a still larger rift-valley, and owes the straightness of its shores to that fact. Thence the subsidence can be traced up the Gulf of Akaba and along the Jordan Valley to the Sea of Galilee. The summits of the walls of this eastern rift-valley still

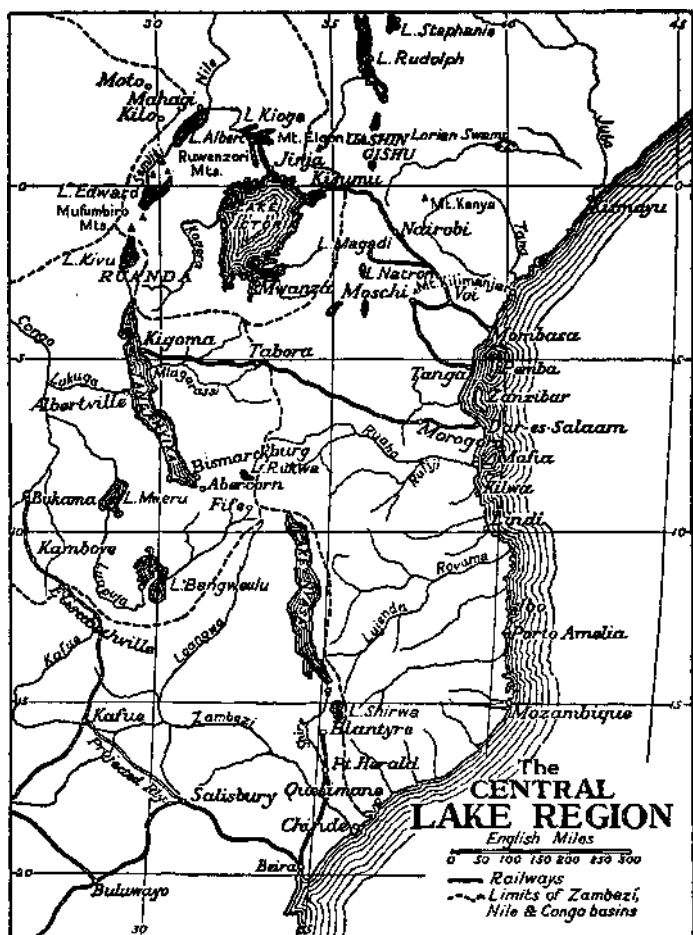


FIG. 2

form the continental parting, and rivers from the eastern side flow into the Indian Ocean, and from the western side to the Congo and the Nile, and so to the Atlantic and Mediterranean. From the central tablelands to the North African plains the descent is comparatively abrupt,

the Somerset Nile falling over the Ripon and Murchison Falls from 3,800 ft. to 2,400 ft. in about 90 miles.

Within this area there is one great mountain range, the Ruwenzori; a volcanic region with a confused mass of still active and recently extinct volcanoes, the Mufumbiro Mountains ; and several more or less isolated mountains, as well as coastal ranges.

60, *The Ruwenzori Range.* The Ruwenzori range, a great granite mass, is over sixty miles long, and stands between Lakes Edward and Albert, partly in Uganda, and partly in the Belgian Congo. Here in the centre of

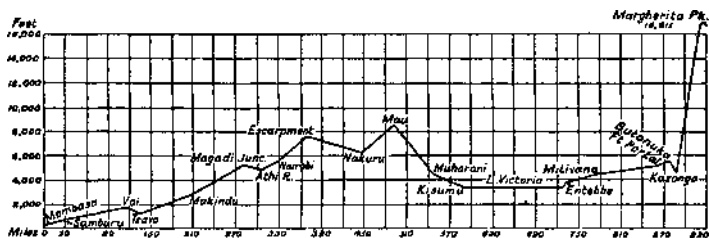


FIG. 3

Africa, actually on the Equator, is a snow-clad range with one peak, Mount Margherita, rising to 16,815 ft., and forming a complete barrier against railway communication between Lakes Edward and Albert. To the west of the range lie the enormous Ituri forest and the Semliki river joining the two lakes. To the east and south-east some of the headwaters of the Nile have their source and drain towards Lake Victoria. The Ruwenzori range has been identified by some with the Mountains of the Moon of Ptolemy the geographer.

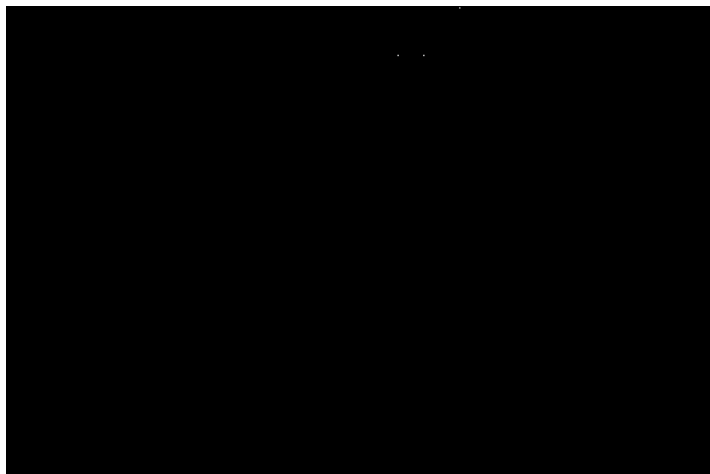
61. *The Mufumbiro Mountains* are also termed the Kirunga Mountains, and, like the Ruwenzori range, contain some of the headstreams of the Nile. They cover a volcanic district lying between Lake Kivu and

three smaller lakes on the north-east, and consist of three groups. In the western group are three active volcanoes—Namlagira, Burunga, and Ninagongo with three craters, one of which is over a mile in diameter. The volcanoes of the middle group—Mikeno, Karisimbi (14,700 ft.), the highest of these mountains, and Vissoke—are probably extinct. In the eastern group, Muhavura (13,547 ft.) was active till recently, but Sabinio and Mgahinga are believed to be extinct.

A great part of the East African plateau shows evidences of volcanic activity. Mount Marsabit, lying east of Lake Rudolph and north of Mount Kenya, and Mount Huri, farther north on the borders of Abyssinia, and numerous other mountains, such as Mount Meningai, near Lake Nakuru, Mount Suswa (7,666 ft.) near Kikuyu, and Mount Longonot (9,007 ft.), are all extinct volcanoes.

62. *Other isolated Mountains and Coastal Ranges.* Mount Kilimanjaro, forming the culminating point of the otherwise low Usambara range which runs inland from near Tanga for a distance of 75 miles, is an extinct volcano, the summit of which is covered with glaciers and snow. It forms an immense and almost isolated mountain mass rising to a height of 19,328 ft. Mount Kenya (18,620 ft.), another snow-clad mountain, covered with magnificent forests of cedar, and situated north-north-east of Nairobi, is also an isolated volcanic peak, and is the centre of one of the most fertile districts in Kenya Colony. Mount Elgon (14,197 ft.), another isolated extinct volcano, called Masoba by the natives, lies north-east of Lake Victoria and west of the Uasin Gishu plateau, a rich farming district on the borders of Kenya Colony and Uganda. Stretching in a line north from Mount Elgon are a number of smaller isolated mountains, including Mount Debasien (9,700 ft.), and Mount Maroto (8,350 ft.).

To the east of Lake Naivasha, a small lake north-west of Nairobi, are two ranges—the Setima Mountains, attaining a height of over 13,000 ft., and the Aberdare Mountains, the highest point of which is Mount Kinangop, 12,772 ft. These mountains lie to the east of the eastern rift-valley, and have a general direction from north to south. With the Mau escarpment on the west and the Kenya massif on the east, they form three

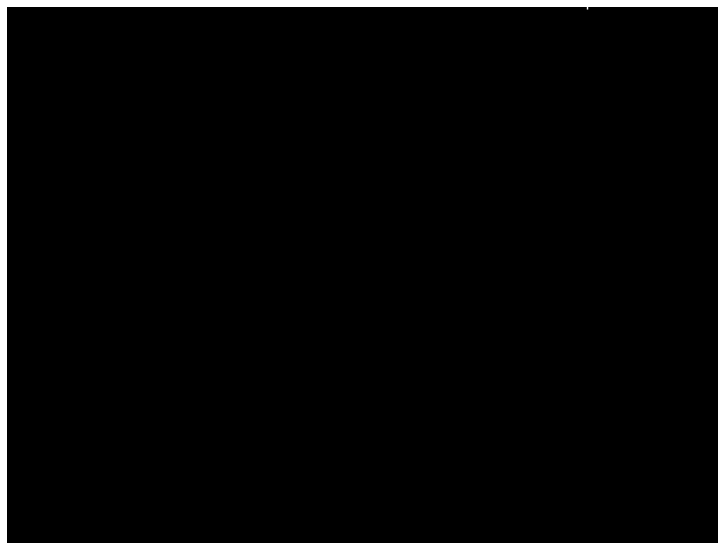


VI. Mount Kibo (Kilimanjaro)

parallel mountainous systems, divided by much lower, but still elevated, valleys. In Tanganyika Territory the interior plateaus are bounded by the following mountain ranges—the Pare (Usambara), Nguru (Unguru), Usagara, and Uhehe ranges, which form the western rampart of the central plateau, and stretch in a half-circle from the neighbourhood of Mount Kilimanjaro to the northern end of Lake Nyasa. None of these mountains attains any great height, but the giant crater of Ngorongoro, 125 miles west of Kilimanjaro, is over 10,500 ft. high.

Mountains and Plateaus ; Deserts 63

63. *The South African Plateau and its Mountain Ranges.* The South African plateau may be taken to begin in the neighbourhood of Abercorn, in the region between Lakes Nyasa and Tanganyika, and to include vast areas to the south, south-east, and south-west of that point as far as Table Mountain, which forms the most southerly extension of the mountain system. One of the characteristics of the South African mountains



VII. Edge of S. African Plateau : Mont aux Sources, Drakensberg

is that many of them are rounded or else appear as flat-topped ramparts. Examples of the latter are Table Mountain, in the south-west extremity of Cape Province, with its flat plain-like surface, and the similar Table Mountains in Natal and the Orange Free State. The sides of these mountains are often abrupt and broken by steep kloofs descending to the surrounding country, but generally speaking when viewed at a distance they appear as a fairly straight and level escarpment.

In South-Central and South Africa there is the same story of vast inland seas as in East Africa, with the exception that the beds of nearly all these lakes have been filled with the offscourings of the higher land and by volcanic action. South Africa is undergoing the same process of desiccation or drying that has turned much of northern Africa into a desert.

As in East Africa, also, there was a long epoch of volcanic activity, of which there are numerous evidences throughout the sub-continent (as South Africa is sometimes termed). The Kimberley diamond pipes are of volcanic origin, and the Drakensberg Mountains are also

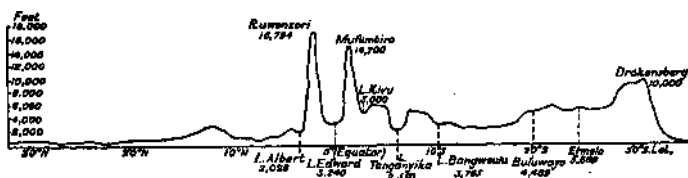


FIG. 4

largely volcanic in character. There are, however, no active volcanoes.

The present topographic features of southern Africa consist of a central tableland culminating in the Drakensberg Mountains, which form part of a mountain system running, like the coast, in a semi-circle from north-east to south-west, and a series of elevated plateaus, the most important of which is the Great Karroo. The South African tableland slopes gently to the west, where it forms the basin of the Orange river, but more abruptly towards the east, especially in Natal, where the mountain ranges closely approach the coasts and give rise to numerous short and rapid rivers flowing into the Indian Ocean.

64. *The Nyasa Region.* The curved line of escarp-

ment which forms the mountain feature of South Africa does not reach the height of the Central African system, and is below the line of perpetual snow. It begins on the Nyasa—Tanganyika plateau with the ranges on both sides of Lake Nyasa in Portuguese and British Nyasaland, and runs southward to the valley of the Zambezi. The highest mountains are on the western side of the lake. ' Mount Rungwe (10,000 ft.) is in Tanganyika Territory to the north-west of the lake. The greatest elevations on the eastern side, where the mountains tower precipitously over the lake, are found in the Livingstone range and its continuation on the north-west frontier of Portuguese Nyasaland, whence the heights decrease to Mount Mangoche (5,450 ft.), between Lakes Nyasa and Chiuta. On the western side of the lake, the Nkondc group is a small but important range varying between 6,000 and 7,000 ft. in height. This is succeeded by the Nyika plateau, with heights of 8,000 ft., the Angoniland plateau, the Kirk range culminating in Mounts Dedza and Chingoni, and the Shire Highlands, an irregular chain with a length of about 90 miles, with Mount Zomba reaching a height of 7,000 ft. Mlanje, a little farther south-east, is a high mass, probably of volcanic origin, rising to 9,843 ft.

The sudden descent from the Nyika and Angoniland plateaus to the bed of the river Luangwa is one of the most striking features of this part of Africa. From the mountains which crown the plateaus on the east, the observer may survey another plain 4,000 ft. below on the west, the precipitous escarpment of which is touched by the Songwe river which falls into the north end of Lake Nyasa, the Chambezi river which drains into Lake Bangweolo, and the Luangwa river which flows towards the Zambezi; these three rivers rising within a relatively short distance of each other.

65. *The Rhodesian Region.* To the south of the Zambezi this elevated region reappears in the high plateaus of Mashonaland, Matabeleland, and Manicaland, which are rich in gold and other minerals. There are no high mountains, but rather a succession of ridges stretching roughly from west to east. In Matabeleland, the Matopo hills cover an area of about 1,000 square miles, and form a confused mountainous mass overlooking the immense Rhodesian and Bechuanaland plains. The average elevation of the whole of these plateaus is about 5,000 ft., and the Matopos themselves form the watershed between the Zambezi and Limpopo systems.

To the west lie the Bechuanaland plains and the Kalahari Desert, ending in the highlands of the South-West Africa Protectorate, where the Amas range, south of Windhuk, reaches a height of 8,100 ft., with the Khomas Mountains still farther west, and the Waterberg range to the north at a slightly lower elevation. The most imposing peak in the country is Omatuka (9,000 ft.), east of Omaruru. These ranges run roughly parallel with the sandy and desert coastal lands at a distance of 100 to 150 miles from the sea, and form the western rim of the Rhodesian and Bechuanaland plains. Inside this broad coastal rampart lies the waterless desert of the Kalahari (see § 77).

66. *The Transvaal Region.* South of the Limpopo river begin the broken ranges of the eastern Transvaal, continued as the Lebombo Mountains into Swaziland and the borders of Natal, running parallel with the coast along the border country of the Transvaal and Mozambique, and pierced at Komati Poort by the railway from Johannesburg to Lourenço Marques. To the west are smaller ranges, running almost at right angles to the main system. The principal of these is the ridge

known as the Witwatersrand, which forms the watershed between the Limpopo and Vaal rivers, and is one of the richest gold-mining areas in the world, with the Magalicsberg and other ranges to the north. These are the highest portions of the great Transvaal plateau.

67. *The South African Ranges.* The Lebombo range is the northern extension of the Drakensberg Mountains, the most important system in South Africa. The latter range, also known as Quathlamba, runs from the north-west corner of Natal, then forms with its outposts the mountainous country of Basutoland, and is continued through the Cape Province, first as the Stormberg and then under a variety of names as the Nieuweveld and Kamsberg Mountains. The highest points are Mont aux Sources (10,000 ft.), Champagne Castle (10,357 ft.), and Giant's Castle (9,657 ft.). This series of ranges encloses on the north and east the great inland plains of South Africa, covering the northern portions of Cape Province, British Bechuanaland, and the whole of the Orange Free State, in relation to which they appear as a curved rampart comprising the basin of the Orange river and its tributaries. To the west this region is further enclosed by ranges which form a continuation of the system in the South-West Africa Protectorate, from which they are divided by the Orange river, and culminate in the Roggeveld Mountains and the ranges behind Cape Town. The interior plateau of South Africa is, therefore, in the form of an inverted saucer with its outer edges corresponding roughly to the coast-line.

South of these main ranges, however, is another series of mountains running more or less parallel with the coasts, and between them and the main system lies the region known as the Great Karroo. These mountains, known as the Hex River, Langeberg, Zwaartberg,

Cockscomb, and Great Winterberg Mountains, are continued from west to east at a distance from the coast ranging between 50 and 150 miles, and enclose numerous fertile valleys, one of which is known as the Little or Southern Karroo. The Great Karroo extends east and west for about 350 miles at a height of 2,000 to 3,000 feet above sea-level, and is the raised bed of a former inland sea. It is mainly a hot desolate region in the summer season, chiefly of value for pastoral purposes, and it is succeeded north of the main ranges by what is termed the High Veld. This consists of great undulating plateaus extending from the Drakensberg Mountains to Bechuanaland, and forms the most characteristic feature of South African topography. The High Veld is broken here and there by isolated flat-topped heights known as kopjes, which rise above the level of the surrounding country, and are due to the weathering or wearing away of the horizontal layers of rock which form the surface of the plateau. In the east of the Transvaal the High Veld descends to the Low Veld, or Bush Veld (a region far less healthy than the more elevated country), to the lower valley of the Limpopo, and to the coastal plain of Mozambique.

As elsewhere in Africa, the South African highlands rise in successive stages from the sea. This may best be illustrated by a journey north from Mossel Bay, between Cape Town and Port Elizabeth, where the traveller sees immediately in front of him a mountain range through which he passes by one of the numerous poorts or passes to the Southern Karroo and the Warm Bokkeveld. Continuing his journey he will cross the rampart of the Zwaartbergen and will emerge upon the plateau of the Great Karroo. Farther north, however, before entering upon the great South African plains, he will have to cross the Nieuweveld Mountains. He will thus have

to surmount three distinct ridges before reaching the interior, and in the main this is true of the greater part of Africa.

68. *North and West African Plains.* The whole of this vast area, forming more than half of the continent and stretching from the valley of the Nile to Cape Verd, and from the Saharan Atlas to the headwaters of the Congo, lies at an elevation considerably lower than that of the rest of the continent. It includes the Sahara Desert with its extensions, the Libyan and Nubian Deserts ; the Sudan ; the coastal regions known as Upper and Lower Guinea, the former lying north of

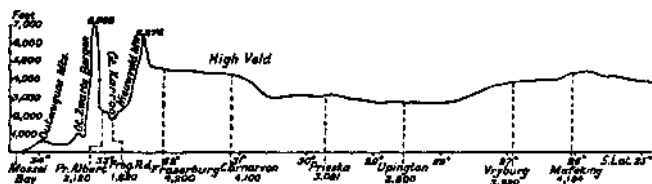


FIG. 5

Cameroons and the latter extending into Angola ; and much of the vast basin of the Congo. Generally speaking, this region is devoid of mountain ranges ; but there are, nevertheless, three well-defined areas in which ranges of considerable height appear. These areas form great plateaus at a higher elevation than the rest of the region.

The Sahara itself (see § 75) is crossed in the centre by a raised area running generally from north-west to south-east, from the Tuat oases and the region south of the Gulf of Gabes to the Nile-Congo watershed and beyond. This raised region includes much of Fezzan, an area of numerous oases, corresponding to the Roman province of Phasiana; the Tasili or plateau of the Asjer; the Ahaggar or Hoggar plateau to the west; and the

Tibesti plateau, which forms the connecting link between the Sudan and the Mediterranean countries, in the centre. A little to the south, though distinct from it, lies the elevated region of Air.

To understand correctly the importance of this elevated region of the Sahara, it is necessary to realize that at an early geological period much of the Sahara was covered by the sea, and that at various times a great part of Algeria, Tunisia, Tripolitania, and Egypt lay beneath the ocean, which apparently extended inland at certain points to the higher regions of the Sudan. The Tibesti plateau, the backbone of the Sahara, was surrounded on the west and east by vast inland seas ; now it is encompassed by sandy beds above the level of the existing ocean.

69. *The Saharan Highlands.* South of the Algerian Sahara in the more elevated area already mentioned, there exist two well-defined mountainous regions—the Ahaggar Mountains and the Tibesti (or Tu) Mountains. The Ahaggar region, which is not inferior to the Alps in extent, contains mountains stated to exceed 8,000 ft. in height, which are reputed to be covered with snow in winter. The principal peaks are Mounts Watellen and Hikena. These mountains, although very arid, are not entirely devoid of water, but at one time they formed the catchment area of important rivers which found their way to the Mediterranean and Gulf of Guinea, as is testified by the numerous dry beds (wadis) of ancient streams, some of which still yield abundance of water at a short distance below the surface. From the south tributaries once flowed to the Niger, which, according to some authorities, then had its mouth in the Gulf of Gabes, where it was joined by the Ighaghar rivej, running from the north-eastern slopes of the Ahaggar plateau, and forming a deep gorge across the

plateau. The tremendous changes brought about by the passage of time are well illustrated by a study of this once fertile region in the centre of a vast area now desert.

North-east of the Ahaggar massif is the Tasili or Asjer, running for 300 miles from north-east to south-east, while the Air massif, south of the Ahaggar region, contains a volcanic crater with an extensive lava bed. Towards the south-east the Tibesti highlands, comprising granite hills capped by volcanic cones, are connected with the lower ranges of Borku (not to be confused with the Borku in the basin of the middle Niger) and Ennedi, which merge with the plains of Wadai and Darfur, two important States of the Central Sudan, before they are broken by the low-lying and swampy region of the Bahr el-Ghazal. Beyond this region the highlands are continued through the north-east corner of the Belgian Congo to the steep western shores of Lake Albert, and form the Nile-Congo watershed.

70. *The West African Mountains.* In Upper Guinea, which is now generally known as West Africa, the main topographical features are : (1) a low-lying swampy coastal area, generally unhealthy for Europeans, with mangrove forests along the estuaries of the rivers and creeks, and extensive lagoons, frequently communicating with each other ; (2) a belt of thick forests, with surface rising gradually to (3) higher and more open country, frequently undulating or hilly, as, for example, in Abeokuta, Ibadan, and Uesha in Nigeria, covered with low bush, and gradually opening, out into (4) the open savannahs of the Sudan. These regions are broken by low-lying river valleys, such as those of the Niger with its great tributary the Benue, the VQlta, the Komoe, and the Bandama ; the two first of which,

especially, run through a very low area. Broadly speaking, the higher country of West Africa, after the coastal regions are passed, extends throughout French Guinea, and is continued north of the Gold Coast Colony and then through Dahomey to the valley of the Niger, beyond which it is continued across the high plateau of Northern Nigeria to the highlands of Adamawa and Cameroons. Within this area lie the two great mountainous districts of Futa Jallon and Adamawa.

71. *Futa Jallon.* The country known as Futa Jallon forms the western counterpart of the Abyssinian highlands, though the mountains do not attain the same height, and are not connected with any great orographic system like that of the East African highlands. Futa Jallon itself forms an elevated plateau crowned by comparatively low hills rising above the surrounding country. It is in French Guinea to the north of Sierra Leone, and the centre of the system is near Teliko, whence ranges spread in an easterly direction towards the Niger and towards the Yamberine, a coastal river in French Guinea, in a south-westerly direction. To the north ranges extend to the plains of Senegal, and southward they extend into Sierra Leone. The mountains of Futa Jallon are chiefly granitic, and occasionally reach a height of 5,000 ft., and the whole area plays a most important part in the hydrography of Africa, since it contains headwaters of the principal rivers of West Africa—the Gambia, Senegal, and numerous others running towards the nearest coasts, and the Niger. In Sierra Leone a range of hills runs almost parallel with the coast, and the peninsula itself terminates with granitic mountains rising to a height of 2,500 to 3,000 ft., before ending abruptly at Freetown—a formation which is only paralleled so far as West Africa is concerned in the Cameroons mountains.

Although the Futa Jallon mountains are the most important they are not the highest in this portion of Africa. In the Ivory Coast a range on the borders of Liberia and French Guinea reaches in Mount Nimba a height of 5,376 ft., while between the Cavally and Sassandra rivers is a mountain ridge of granitic formation averaging from 2,500 to 4,500 ft. in height. Farther west in the same country the Kong plateau, 2,300 ft. above the sea, is crowned by low hills known as the Kong Mountains, only about 300 ft. higher than the surrounding country. In Togoland there is a range of hills running from north to south, but of little importance except as a catchment area for the Volta, Sio, and other rivers ; while to the north-east in Dahomey there is another unimportant range called the Monts de l'Atakora. In the great bend of the Niger there is a rocky massif crowning the central plateau, and forming a continuation of the high granitic plateaus of Dahomey, and having peaks of from 1,200 to 2,000 ft. above the surface of the surrounding plain. From this point, however, there are no important mountains eastwards until the highlands of Northern Nigeria are reached. Hence what may be termed the coastal rampart (although it commences at a considerable distance from the coast), which runs east from the borders of Sierra Leone, is continued through Adamawa, where it turns south and stretches, not far from the coasts, in a line broken by river valleys, to Table Mountain. These mountains form the western rim of Africa (see § 8).

72. *Nigeria and the Cameroons Area.* The undulating grass country of the northern districts of southern Nigeria gives place to a range of hills which determine the southern limits of a vast plateau occupying, the greater part of northern Nigeria. The surface of this

plateau is generally undulating, and in a railway journey from Jebba on the Niger to Kano there are numerous changes of level. Generally speaking, the elevation of the plain is low. At Jebba, in the Niger valley, it is only 250 ft. above sea-level, but it rises gradually for about 170 miles to 1,000 ft., and then in another 150 miles it attains a height of 2,000 ft. at Zaria, the culminating point of the plateau. Portions of the plateau are crowned by mountains. In the provinces of Bauchi and Zaria there are ranges running from north-west to south-east to the valley of the Benue, reaching in the former province a height of 6,000 ft. Bukuru, the terminus of the Zaria-Bukuru line, is 4,100 ft. above sea-level. Eastward across the Benue the mountains reappear in the province of Yola, and there form a mountainous region, largely of volcanic origin, extending throughout the border country of what was German Cameroons. Beginning in Adamawa (of which Yola formed a part) the ranges continue in a south-westerly direction from the low-lying country south of Lake Chad to the sea in the neighbourhood of Buea, terminating in this direction in the lofty Cameroons Peak, 13,746 ft. high. These ranges are in reality a continuation of a great volcanic belt marked in the Gulf of Guinea by the string of islands, Annobon, St. Thomas (San Thome), Principe, and Fernando Po, and continuing by way of the Mana Hills in Darfur to the extinct volcanoes in the Bayuda bend of the Nile, between Dongola and Khartum. In Fernando Po itself there is a volcanic peak (Mount Clarence or Pico Santa Isabel), 9,300 ft. above sea-level.

73. *Geological Conditions.* Geologically the greater part of West Africa consists of an enormous zone of granite, gneiss, and crystalline rocks. This huge mass of old rocks, however, as has been seen, does not form

the core of a great mountain system, but is of comparatively low elevation, having been reduced by erosion and denudation. Great volcanic upheavals have undoubtedly taken place in the Cameroons and Adamawa area, but elsewhere the country has remained much as it is throughout long ages.

74. *Deserts and Desiccation.* A considerable part of Africa consists of desert, and perhaps an even larger portion is now undergoing a process of desiccation, or drying up, which if not arrested may turn many fertile districts into arid wastes. How this process is to be stopped is a problem that is still being investigated, but that it exists is no longer open to doubt. It has been hastened by river-erosion, but other causes are at work which are at present not properly understood.

In Roman and Carthaginian times much of northern Africa that is now regarded as unsuitable for the production of cereals was certainly more productive than it now is, especially in Cyrenaica (the country of the five cities, the Pentapolis of the Ancients, viz. : Berenice, Barca, Cyrene, Apollonia, and Arsinoe, and long known as the Garden of Hesperides), Tripolitania, and southern Tunisia, and Algeria. In these regions the overthrow of Roman civilization by the Vandal invasions resulted in thousands of acres of productive land going out of cultivation, and the hand of man hastened the process of destruction as much as did the work of nature. The destruction of forests has played an important part in this process of desiccation. Elsewhere in Africa where desiccation has set in, it has been almost entirely a natural process.

In South Africa within comparatively recent times a profound change has taken place with regard to the supply and distribution of water. When the Dutch first arrived at the Cape and until the beginning of the

nineteenth century, the whole of the sub-continent was teeming with large game, some of which, such for instance as the hippopotamus, could only have existed in a well-watered country. Hippopotami then abounded in every river in South Africa; and even in the Kalahari, in districts that are now absolutely sterile, the bones of these animals are to be found. There are people now living who have shot hippopotami in the southern rivers of the Transvaal in places where there is now insufficient water for these animals; while in Basutoland native names of streams often embody the word for hippopotami. The accounts of all early writers contain evidence that the country is not as it used to be.

Farther north the same process is going on. Lake Ngami, as described by Livingstone, does not correspond with the present swamp, and other travellers of that recent period have left descriptions which show that this region was then much more fertile than it now is. Moreover, in Ovamboland in the north of the South-West Africa Protectorate, the process of drying has been so rapid that the natives have died in considerable numbers owing to the loss of their former water-supplies. In Central Africa, too, the levels of the great lakes have fallen during recent years, and Lakes Victoria and Albert are stated to be lower than they used to be, while the outlet from Lake Nyasa—the Shire river—once navigable, is now almost useless for that purpose. In the Sahara, inland cities, such as Taudeni, existed where human life is now impossible.

75. *The Sahara.* The regions of Africa where the process of desiccation has reached its greatest development are the Sahara, including the Libyan and Nubian Deserts, the coastal region of South-West Africa, the Kalahari Desert, and portions of Somaliland. The Sahara, as we have seen, covers an enormous area, stretching

from the coasts of the Atlantic to the shores of the Red Sea, though the whole is not entirely a desert region as is popularly supposed, but contains many districts where some vegetation flourishes, as well as numerous fertile oases. The latter, however, are frequently along the courses of former rivers. No definite boundaries can be set to this region, which begins south of the Atlas ranges and extends southward almost to the great bend of the Niger ; and farther east starts abruptly from the shore of the Mediterranean, especially in the neighbourhood of Solium, and extends southward to Wadai, Darfur, and Kordofan.

The Sahara is far from uniform in character. In the centre we have seen (§69) that there are well-defined mountainous regions presenting a barrier more formidable than the sand. The whole area is crossed by dried-up river valleys known, whether occasionally containing water or not, as wadis or wads (correct plural, *wadiari*). The desert, moreover, is not uniformly sandy, for upon the summits of the plateaus the ground is generally rocky and covered with large stones. These regions are known as Hamadas (correct plural, *Hamad*) or Gautras, and when these areas are crossed by ravines they are called Chebkas. In the purely sandy regions large dunes are formed by the action of the strong winds, and these are called Ergs (correct plural, *Orug*). The region known as the Tanezruft—an absolutely sterile area without water or inhabitants—lies between the Ahaggar massif and the elevated country of Adrar-des-Iforas. In all of these regions, wherever there is no vegetation the rocks which form the surface, of the desert weather much more quickly than where they are protected by plants. Through the alternate heating of the daytime and the cooling of the night, small fragments are splintered off which are gradually weathered

down into fine sand. The amount of sand in the deserts is thus always being added to as fresh regions lose all traces of vegetation. The sand thus formed is shaped by the action of the wind into huge masses, which present a succession of heights and hollows, so that in a journey over the Sahara it is impossible to see for any great distance wherever these sand dunes occur.

To the east of the Sahara proper lies the Libyan Desert extending to the Nile, and beyond the Nile is the Nubian Desert.

76. *Oases on the Sahara.* The principal oases of the northern Sahara are Wargla and Tuggurt, in southern Algeria, both irrigated from deep wells ; Tuat, Guara, and Tidikelt, areas containing numerous oases, lying to the south-west of Algeria ; Tafilet, a large oasis in the south of Morocco, containing numerous villages ; Adrar (northern), an elevated district containing numerous oases, to the east of the Spanish territory of Rio de Oro ; and Ghadames, Ghat, and Murzuk, in Italian Libia. In the Libyan Desert the principal oases are Siwa, Jarabub, and Kufrah, the two last being cities of the Senussi, a fanatical Mohammedan sect whose head-quarters are at Kufrah in the centre of the desert.

77. *Kalahari Desert.* The Kalahari Desert of South Africa, like the Sahara itself which gradually extends into the Sudan, has no precise boundaries on the south, but merges into the Bechuanaland plains. West and east it is enclosed by the highlands of the South-West Africa Protectorate and the high ground of the Rhodesian and Transvaal plateaus. The Kalahari is an elevated basin in which the ground falls gradually from north to south, and thus offers a natural outlet for the waters of the Cunene, Okavango, and Chobe rivers, but these rivers have been diverted elsewhere, and only once in recent years have some of their waters found their

way into their old courses. A great irrigation project has been suggested to render the whole of the Kalahari fertile again, by damming the three rivers and diverting sufficient water from them to flood the depressions in this region.

VI

SURFACE FEATURES: WATERWAYS

78. *Characters of Waterways.* The waterways of Africa may be divided into four groups : (1) those which drain towards the Mediterranean, (2) those which drain towards the Atlantic, (3) those which drain towards the Indian Ocean, and (4) those which have no outlet towards the sea. From the economic point of view they may be divided into six classes : (1) the lakes of the interior, (2) the lagoons of the coastal regions, especially those in West Africa and Portuguese East Africa ; (3) rivers that may be navigated from the sea by ocean-going ships ; (4) rivers that may be ascended by steamers and steam-launches of considerable draught ; (5) rivers that may be ascended by light-draught launches and barges ; and (6) rivers that can only be navigated by canoes and other small native craft. The last four classes are not exclusive of each other, for the same river may be open to the four different types of navigation in different sections of the river. Moreover, many African rivers, probably the majority, are only navigable in sections, since they may be blocked at intervals by cataracts, as the Nile, Niger, Congo, and Zambezi are, or may rush through gorges that render ordinary navigation impossible. Many rivers are only navigable in the seasons of flood.

79. *Rivers and Natural Routes.* The principal navig-

able river of Africa is the Nile, which is probably used for navigation to a greater extent than all the other rivers put together. In the delta of the Nile the various

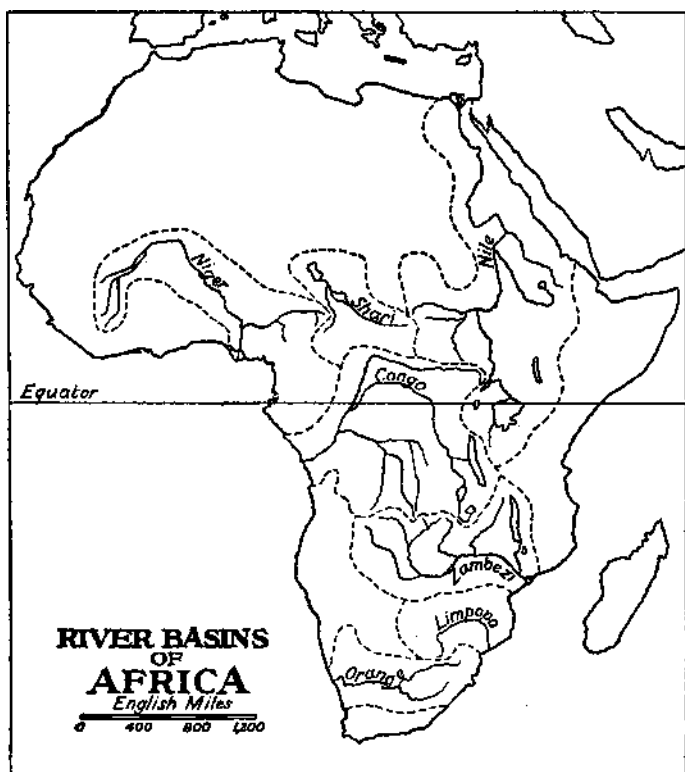


FIG. 6

branches of the river are connected together by an extensive system of canals which, in conjunction with the numerous light agricultural railways, offer an unrivalled system of internal communication. The series of waterways next most extensively used is the Congo and its numerous affluents.

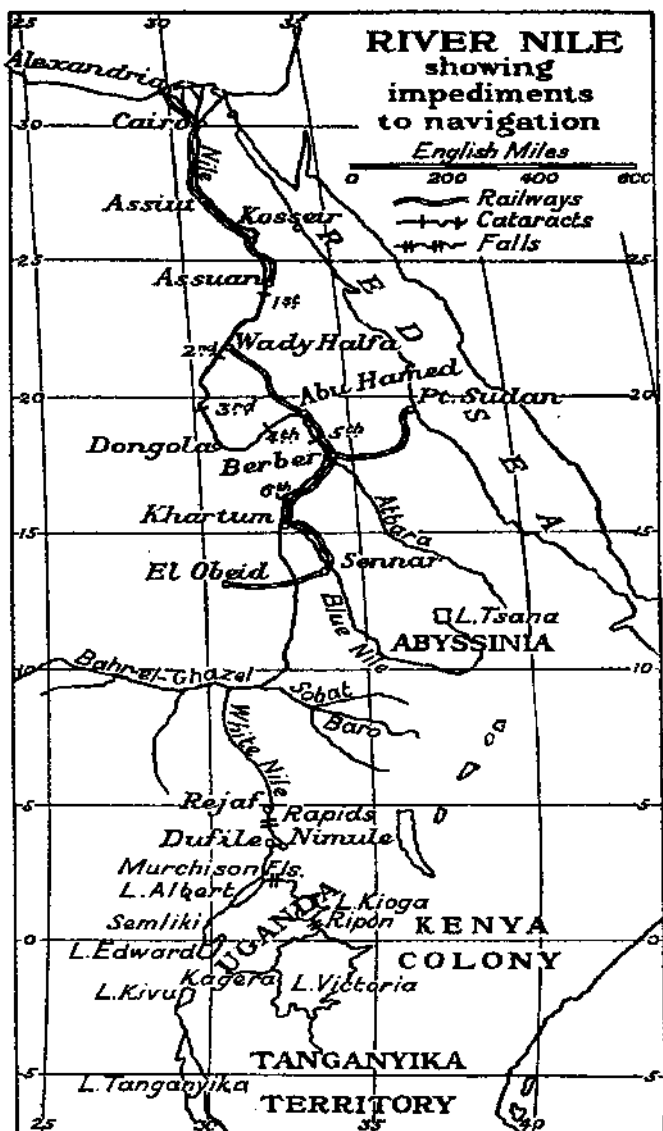
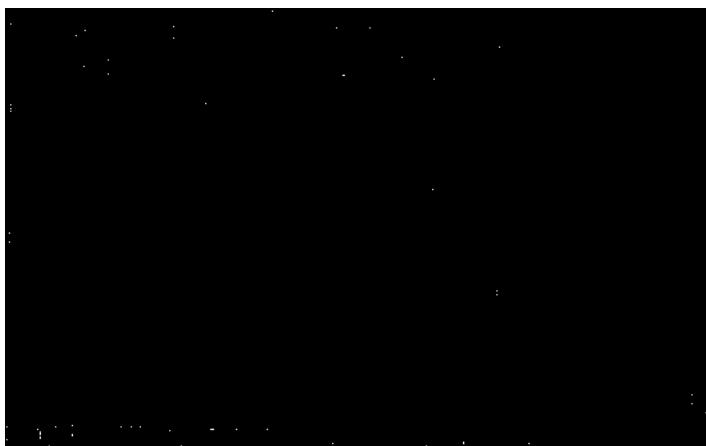


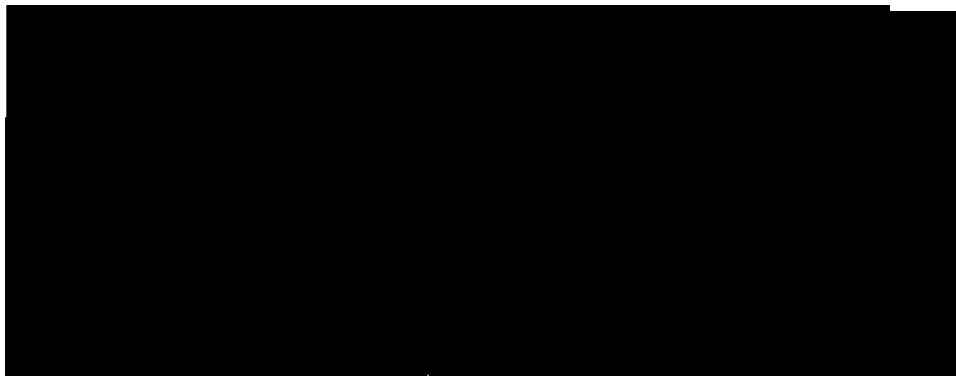
FIG. 7

rapids as far as Rejaf, from which point steamers run to Khartum. Beyond Rejaf begins what is termed the Sudd region, where the courses of the waterways become choked with vegetation, the main river being kept open by specially constructed steamers. Here the Nile is reinforced by numerous streams running into the Bahr el-Ghazal, and turning east and again north, where the Sobat river enters from the south-east, it continues



VIII. Murchison Falls

as a broad navigable highway through a drier steppe-like region forming the south-eastern portion of the Sudan, to Khartum, where it is joined by the Blue Nile which issues from Lake Tsana in the centre of Abyssinia. Farther north below Berber, the river Atbara, which with the Blue Nile collects the melting snows and heavy monsoon rains of the Abyssinian highlands, enters the river. Below Berber for some 1,800 miles the Nile is the one source of water in what would otherwise be a waterless desert, and only along its banks or their near



IX. Shabluka Gorge of the Nile (from an aeroplane), 60 miles above Khartum

neighbourhood is settled life possible. At Abu Hammed the Nile makes a great bend to the west through the arid region of the Nubian Desert, and from Wady Haifa, the frontier station of Egypt, it runs again generally northward to the Mediterranean. Between Khartum and Assuan, about 24° N.lat., the Nile is impeded by numerous rapids and cataracts, and at these points occur the chief towns outside the delta region. As the Nile approaches the sea, it forms a huge delta and falls into the Mediterranean by two principal mouths—the Rosetta mouth on the east, and the Damietta mouth on the west, the other five mouths being silted up. Along the coasts are Lake Menzala, through which runs the Suez Canal, Lake Burullus, Lake Edku, and Lake Mariut. The great port of Alexandria is situated on the neck of land between Lake Mariut and the sea. It should be noted that this delta region of the Nile with its swamps and marshes always formed a barrier to intercourse with Egypt. The Egyptians never became a maritime nation, and Alexandria was rather a foreign port than an Egyptian city. The length of the Nile proper, from Lake Victoria, is estimated at 3,410 miles.

81. *Other Rivers of North Africa.* There are no other important navigable rivers in Northern Africa. From the Nile to the mouth of the Mejerda, which enters the sea in the Gulf of Tunis after a short and rapid course through Tunisia, there are no rivers at all. From the Mejerda to the southern portions of Morocco the rivers are merely streams descending impetuously from the Atlas Mountains, only navigable for short distances from their mouths, as is the case with the Sebu river which can be ascended by ships as far as Kenitra, or else seldom finding their way to the sea, as is the case with the Wad Draa in the extreme south of Morocco. This river pierces the Anti-Atlas, flows through the

desert, and only occasionally finds the sea south of Cape Nun. The Wad Muluya, which falls into the sea in the neighbourhood of Melilla, near the Moroccan-Algerian frontier, is the most considerable stream of northern Morocco, and the Wad Cheliff, which runs through the fertile Cheliff plain, is the most important river of Algeria. Most of these rivers run through deep gorges. Some of them run parallel with the mountain ranges and end in shallow salt lakes called shatts (French *chotts*), one group of which is to be found stretching in an almost unbroken line from the Biskra-Tuggurt railway in Algeria to the Gulf of Gabes. The principal of these depressions, such as the Chott El-Jerid, form an effective barrier to railway extensions southwards.

82. *The Senegal Area.* From Morocco to the mouth of the Senegal stretches an arid coast unbroken for 900 miles by any waterway. The Senegal river, which falls into the sea at Saint Louis, a French port in the Senegal Colony, is the first river of West Africa, and rises in the watershed between that river and the Niger. Running north-west in a great curve, it then continues south-west to the Atlantic. The mouth of the river becomes almost blocked with sand in the dry season, but during part of the year ships can ascend as far as Kayes, an important town connected with the Niger by means of a railway to Bamako and Kulikoro, and joined with the French port of Dakar by a railway across Senegal. Two of the tributaries of the Senegal river, the Baule and Bakoy (White), rise not far distant from the main branch of the Niger. A third, the Bafing (Black) river, with the Faleme, an important affluent on the left bank which enters the Senegal below Kayes, rise in the mountains of Futa Jallon. The flat surface of the country through which these rivers flow results, during the rainy season, in the formation of

considerable lakes, which facilitate communication by small boats and canoes.

83. *The Gambia Area.* Farther south the Gambia river is a great navigable stream that can be ascended at all times by vessels for some 150 miles from its mouth at Bathurst. The Gambia forms an estuary expanding at the entrance from two to seven miles in width. About 276 miles above Bathurst the river is blocked by the Barrakunda Rapids, which stop all further navigation from the coast. The total length of the river, which rises in the Futa Jallon highlands, is about 1,000 miles, and it is of great value as an economic highway ; but its full use can only be achieved when there is railway communication between it and the upper waters of the Senegal and Niger, for which it forms a natural outlet. At present political reasons result in internal traffic finding its principal outlets by means of the railways to Dakar and Konakry.

84. *The Niger Area.* The Niger river, rising in the highlands of Futa Jallon near Tembikunda upon the borders of Sierra Leone and French Guinea, is the most important river of West Africa and flows for some 2,600 miles mainly in an easterly direction to the Gulf of Guinea, draining an area roughly estimated at 1,020,000 square miles, including the basin of the Benue. The upper sections of the river are divided into three main branches which, just above Siguri, unite to form one river.

The Niger consists of practically three different rivers, two of which are tropical in character, while the intermediate section is largely a desert stream. The tropical rains of Futa Jallon form the Upper Niger, which during the rainy season, below Bamako, expands and covers the plains so as to form innumerable lakes and marches which are quickly reduced in size by the process of

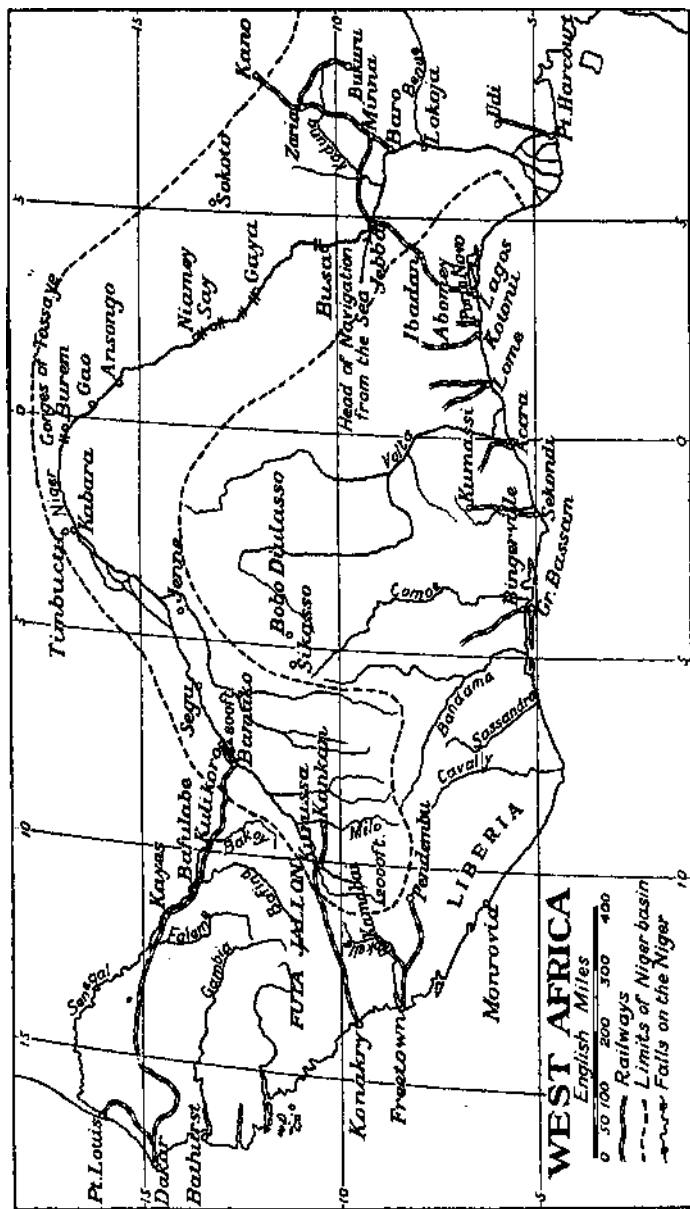


FIG. 9

evaporation. This section then covers a great plain where the fall is only about one foot in ten miles. In other words, the accumulated waters, instead of finding their way to the sea, are largely dispersed by evaporation, so that the lower river fails to receive much of the water which would otherwise find its way to the sea.

From the source of the river to Bamako, on the railway from Kayes to Kulikoro, in a distance of about 375 miles, the river falls from 2,800 ft. to 800 ft., and is navigable between Kurussa, and for a short distance above that place, and Bamako, below which place navigation is stopped by a barrier of rocks, but is resumed below Kulikoro, whence boats run to Kabara, the port of Timbuktu, and can continue to Ansongo, 870 miles below Kulikoro, and, under favourable circumstances, as far as Niamey. Below Niamey there are numerous rapids as far as Gaya in French territory near the borders of Nigeria, which render navigation of any kind extremely difficult.

The first section of the river runs north-east to the neighbourhood of Timbuktu, where it may be said to terminate. It receives no important tributaries on the northern side, but is fed by the important Bani or Bangoe river which rises in the Kenedugu highlands, and for some distance runs almost parallel with the Niger before entering it on its southern side. Below Timbuktu the second or desert section flows through sandy country without rain and without affluents, and has a struggle for existence ; but in the neighbourhood of Say it enters the region of tropical rains and continues from this point in a south-east direction, having turned in this direction at Burem, where the river forces its way through the rocky gorges of Tossaye. Geological evidence shows that the whole of this region, covering the great bend of the Niger, once formed an immense inland sea.

South of Gaya, as far as Sakachi, the river is again navigable. Between Gaya and Jebba, over a section of about 120 miles there are numerous rapids, including the Bussa Falls, where the explorer Mungo Park lost his life. Jebba marks the head of navigation from the sea for shallow boats and is the place where the railway from Lagos to Kano crosses the river, but navigation.-



X. The Niger near Jebba

to this point is frequently difficult, and Baro, lower down, from which point runs another railway connecting with the Lagos - Kano line, is open to shallow vessels throughout the year. As with the Zambezi, navigation on the lower sections of the river is difficult, and the estuary of the river, with its numerous mouths, requires frequent dredging.

85. *Tributaries of the Niger.* The principal tributaries of the Lower Niger are the Sokoto, Kaduna, and Benue,

on its left bank. The last is an important waterway joining the Niger 230 miles above its mouth, and forming a highway into the heart of the central Sudan. Though shallow in the dry season, it can be navigated under favourable circumstances as far as Yola, and thence to Garua and Lere, in the northern Cameroons, where the river rises. The Niger delta, forming the division between the Bight of Benin and the Bight of Biafra, has a coastline of over 150 miles, and contains a wonderful system of waterways, frequently termed creeks, connected with the estuaries of several large rivers and rendering possible navigation by lagoon and creek, parallel with the coast, almost from side to side of Nigeria. The most important of this network of rivers are the Benue, Forcados, Sombreiro, Bonny, Imo, Kwa-Ibo, and Cross, which form a region once known as the Oil Rivers Protectorate. An excellent harbour, called Port Harcourt, is being developed at the head of the estuary of the Bonny river.

86. *The West African Coastal Area*, The first considerable opening south of the Gambia river is the Cacheo river in Portuguese Guinea, navigable for ships for about 100 miles from the sea. Farther south the Jeba river has a large estuary, and the Bolola river (Rio Grande de Guinala) is stated to be navigable for about 450 miles. These rivers rise on the west side of the Futa Jallon plateau, as do the Nunez, Pongo, Dembia or Baramaya, Debrecka, Morebain, and Forikaria rivers of French Guinea. In Sierra Leone, the Sierra Leone or Rokell and the Sherbro rivers drain the interior plateaus of that colony.

In the Ivory Coast begins the series of coastal lagoons, navigable for small steamers, that stretches along the littoral as far as Lagos. Into these lagoons numerous rivers empty themselves, though they are as a rule of

small use for navigation. The Cavally, Sassandra, Bandama, and Komoe rivers run mainly from north to south and drain the Kenedugu plateau and Kong highlands. The Volta, the principal river of the Gold Coast Colony, rises as the Black Volta, runs across the country north of Ashanti, and is joined by the White Volta flowing from the north. Then taking a great bend to the south, it enters the sea near Addah. The Volta is obstructed by cataracts, and its generally rapid course is a serious difficulty to navigation. The other rivers of the Gold Coast drain the interior plateau of Ashanti, and are comparatively short ; the Ancobra and Tano alone being available for navigation. In Dahomey, the Wemi, with its tributary the So, is navigable for small boats. Although navigation of all the West African coastal rivers is seriously obstructed, they are nevertheless of great commercial value as outlets for the produce of the interior.

87. *The Chad Area and Regions of Internal Drainage.* The Lake Chad area forms one of the most interesting regions in Africa because it is the centre of a great zone of inland drainage. Although not unique in this respect, it is the largest existing region of this nature in a continent that at one period contained vast areas of a similar character. The size of the lake is continuously decreasing. For ages the Benue and its tributaries have been stealing into its basin and actually intermingling with the Chad affluents. The process at work in the Chad area affords present confirmation of the theory of similar captures in other parts of Africa, and the time will eventually arrive when the waters of the Chad will be directly diverted westwards to the Atlantic. Lake Chad forms the outlet of the Shari (Chari) river, and this and thq, Komaduga are the only considerable affluents of the lake. The Bahr el-Ghazal, at the south-east corner,

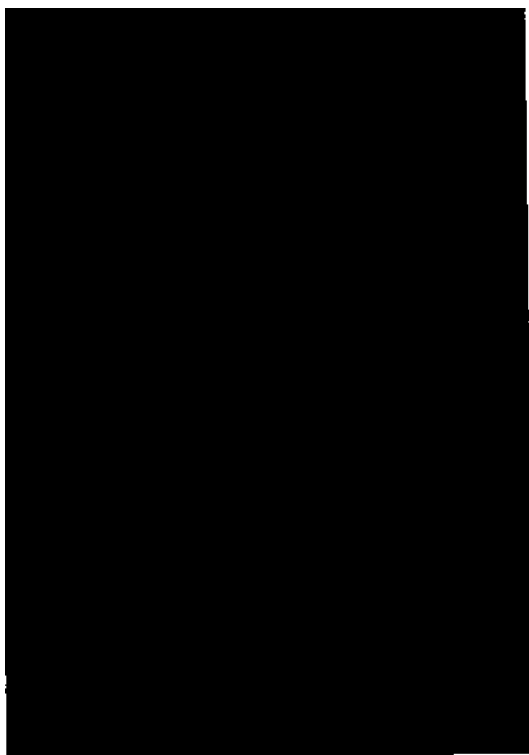
is generally considered to be an effluent rather than an affluent of the lake, as it flows out of the lake and loses itself in a series of swamps. It has no connexion with the Nile tributary of the same name.

The Shari, with its main tributary the Logone, forms a great navigable waterway and is the only present means of comparatively easy access to the French territories in these regions. Navigation is at all times possible by small launches up the river from Lake Chad to Fort Lamy, situated at its junction with the Logone river, and thence to Fort Archambault, whence small boats ascend to Fort Crampel on the Shari-Gribungui, which rises in the divide between that river and the Tomi affluent of the Ubangui tributary of the Congo. The whole region is traversed by numerous tributaries flowing into the Shari, mainly on its western or left bank, and rising in the watersheds between the Congo tributaries, the Shari basin, and the coastal rivers of Cameroons. The Logone, the most important of these rivers, is navigable for considerable distances.

Other representative districts of internal drainage in Africa are the Lake Ngami region, once occupying an enormous area like that of Lake Chad : the Lorian swamps in Kenya Colony; the Gash and Danakil regions in the east of the Anglo-Egyptian Sudan and Abyssinia ; and the Lake Rudolph area. Lake Ngami is now nothing but a reedy marsh, but was formerly connected with the great Makarikari depression to the east and with numerous other depressed regions in the neighbourhood. Within recent times the area of water has been contracting, and this process still continues.

88. *Other areas of Internal Drainage.* In the Jubaland portion of Kenya Colony, the Lorian swamps, into which the Uaso Nyiro empties itself, probably form the last

remnants of the great inland sea which once covered this portion of East Africa. The Gash river, which is only representative of numerous similar intermittent



X I . Moist gorge with vegetation, Algerian edge of Sahara

streams in the more sterile portions of Africa, after rising in the Abyssinian highlands forms an inland delta to the east of Kassala and loses itself in the sand. A similar area exists in the great waterless Afar or Danakil region in the east of Abyssinia, which forms a barren waste in which numerous rivers, descending

the great escarpment, lose themselves. In the north lies Lake Assale and the Plain of Salt, 400 ft. below sea-level. To the south is Lake Aussa, in which the river Hawash loses itself. Along the course of the eastern rift valley or in its immediate vicinity are numerous areas of inland drainage, such as Lakes Baringo, Rudolph, and Stephanie, fed by numerous small rivers, and having no apparent outlets.

Rivers of this nature are of no use for navigation but may be of great value for irrigation, such, for example, as the Gash. Some of them seldom or never appear above the surface, but afford abundant water when tapped by boring. Such a river is the Wad Rhir in the Algerian Sahara, along the course of which are numerous fertile oases.

89. *The Congo Basin.* The basin of the Congo covers an enormous area in Central Africa, estimated to be more than 1,300,000 square miles in extent. This region includes two of the great Central African lakes—Tanganyika and Kivu—and stretches from about 8°30' N. lat. to 14°30' S. lat. and from 13° to 34° E. long., but suddenly contracts to a width of 1 or 2 degrees, or even less, between Stanley Pool and the Atlantic. A line drawn from Addis Abeba in Abyssinia to Yola, in the east of Nigeria, would almost touch the most northerly part of the basin, while the most southerly part extends to the southern limits of Katanga and the most westerly to a point beyond Tabora in Tanganyika Territory.

The greater part of this area consists of a vast central plateau, comparatively low in height, traversed by an enormous number of tributary waterways, some of great size, which find their only outlet to the sea through a deep gorge, so narrow in parts that it has been impossible to run a railway through it. This gorge, or rather series of narrows, confines the lower reaches of the river

between Matadi and Leopoldville. It has been cut by the river through the Crystal Mountains, a range of hills of crystalline formation which run from Cameroons into Angola with an average height of 2,500 ft., at the back of two parallel coastal plateaus.

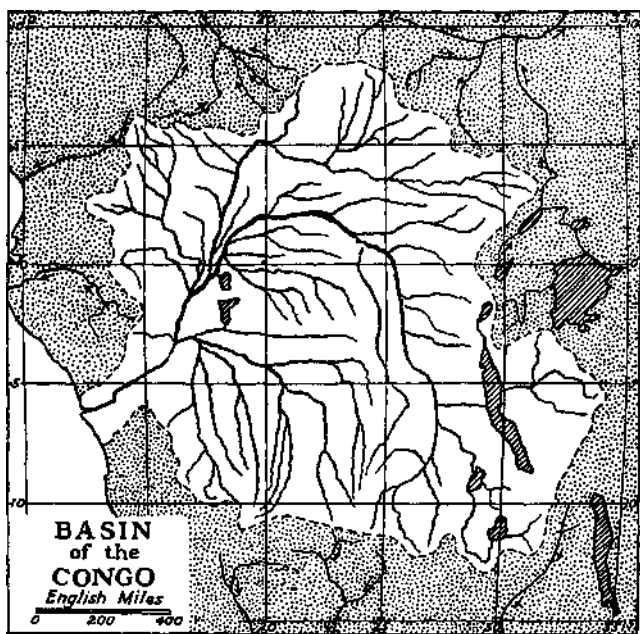
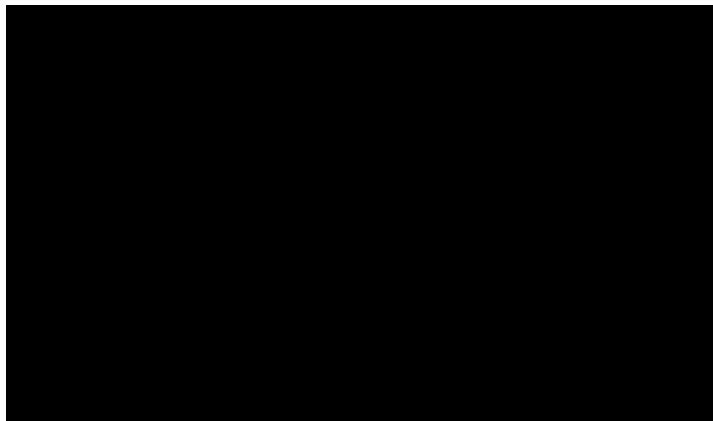


FIG. 10

The Congo, in common with other African rivers, has burst from its original course and now flows westward to the Atlantic ; a very large part of the present basin having once been a great inland sea, through the sandstone formation of which numerous great rivers subsequently carved their way northward before joining the main stream. The only portions of this former submerged region now remaining are Stanley Pool, Lake Leopold II ,

and Lake Tumba ; but vast areas are still subject to inundations and others remain marshy generally.

This area is enclosed, generally speaking, by higher ground on the north, east, and south, and thus in the true sense forms a great interior basin in the centre of Africa. In the north-east occurs the divide between the Nile and the Congo, where the plateau falls somewhat sharply towards the central basin but is generally a



XII. The Congo at Yakata

series of monotonous plains with no well-defined crest. Along the east is the rampart of the Central African mountains ; but at the north of Lake Tanganyika the basin encroaches on the Tanganyika plateau and continues southwards across the region between Lakes Tanganyika and Nyasa, includes the swampy area around Lake Bangweolo and Lake Mweru, and then embraces the high plateau region of Katanga. The latter, in reality, is a continuation of the High Veld of South Africa, and belongs physically to the South African plateau. For this reason it has been developed largely

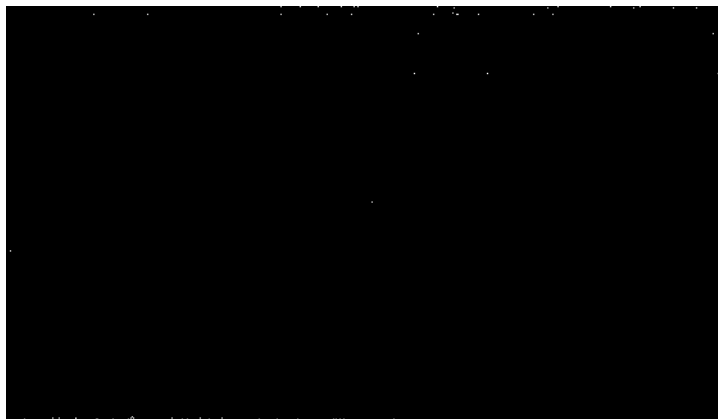
by the northward movement of Europeans along that plateau.

90. *Sources and Outlet of the Congo*, Although the Congo and its affluents form an unrivalled system of interior water communication in Africa, they do not at present give unity to the country, because they are broken by numerous rapids ; but by a combination of rail and water transport, the failure of nature to provide through routes is largely overcome. The whole traffic going down the Congo has to pass through the river port of Matadi, for, unlike other African rivers, such is the power and force of the water descending the stream, that there is no delta at its mouth with the possibility of numerous ocean ports.

The Congo has two main sources in the south—the Lualaba, which rises on the borders of Rhodesia to the east of Elizabethville, and the Luapula. The latter river rises as the Chambezi, to the south of the Tanganyika plateau, runs through Lake Bangweolo, and then takes a bend to the northwards, and passing through Lake Mweru, joins the Lualaba at Ankoro, whence the main river continues north to wStanleyville. From this point it takes a great bend to the west and south-west, and being joined by the Ubangui a little to the north of Lake Tumba, continues in a south-westerly direction to the sea.

91. *Navigable Course of the Congo*. From Bukama, whence there is railway communication with Cape Town 2,598 miles to the south, the Lualaba-Congo is navigable for 384 miles to Kongolo. Between these two points it is joined by the Lukuja river on the east, through which the surplus waters of Lake Tanganyika are discharged as well as those which come from the much more elevated La&e Kivu by means of the Russisi river connecting these two lakes. Between Kongolo and Kindu.there is

a series of rapids, but below Kindu the river is again navigable to Ponthierville, over a stretch of 189 miles, beyond which point another series of rapids, known as Stanley Falls, again impede navigation as far as Stanleyville. Here the river leaves the higher parts of the lake plateau. Up to this point the Congo is a rapid river ; but from Stanleyville onwards there is unimpeded navigation for 1,000 miles as far as Leopoldville, on



XIII. Falls at Stanleyville, Congo

Stanley Pool, on the eastern side of the gorges which render the passage through the Crystal Mountains impossible for boats. This navigable section of the river flows across an immense level region, covered with dense tropical forests, and the Congo sometimes breaks into numerous channels and sometimes flows as a noble river many miles broad. West of Stanley Pool begins the rapid descent from a height of 952 ft. at Leopoldville to 86 ft. at Matadi, through the 223-mile cleft in the rocks, the final plunge being made over the Yellala Falls. These rapids are known collectively as *Xhe*

Livingstone Falls. From Matadi to the sea, 110 miles, navigation is possible for ocean-going ships, but the river, here 5 or 6 miles broad, is impeded by shifting sand-banks. Between the mouth of the Congo, at Banana, and Bukama, a distance of 2,500 miles can be traversed by a combined rail and water route, the total length of the river being estimated at some 3,000 miles.

92. *Tributaries of the Congo.* The following are the chief navigable tributaries of the Congo, on the left bank, proceeding down stream, but most of these rivers are blocked in places by rapids, and some are only open to navigation during the rainy season : (1) Lomami, running parallel with the main river ; (2) Lualaba and Lopor ; (3) Ikelemba ; (4) Ruki, fed by numerous navigable tributaries, and consisting of about 1,200 miles of navigable waterways, (5) Kiwa, afterwards becoming the Kasai, embracing with its tributaries, the Kwango, Lulua, Sankuku, and Lukenie, about 1,500 miles of navigable waterways, and draining the whole of the western portion of the Congo basin. On the right bank of the Congo there are numerous large tributaries providing useful routes into northern Equatorial Africa : (1) Aruwimi, rising in the watershed west of the Kilo and Moto goldfields and entering the Congo at Basoko ; (2) Itimbiri, farther on known as the Rubi, entering the Congo at Moenge ; (3) Mongala ; (4) Ubangui, an immense river draining the south of French Equatorial Africa, and by means of its main tributary, the Welle, the north-eastern portions of the Belgian Congo. The Ubangui river is navigable up stream as far as Bangui, and with great difficulty as far as Mobaye. The Welle river is stated to be navigable for some 400 to 450 miles ; (5) jSanga, joined near its confluence with the Congo by the Likuala. The Sanga is navigable as far as Wesso

and beyond that point well into Cameroons, the south-east portions of which, with its tributaries, it drains.

It is computed that these rivers embrace some 7,000 miles of navigable water, but it must be remembered that the depths of the water vary greatly with the seasons, and that before the whole system can be utilized properly in the service of mankind, extensive engineering works are requisite in order to overcome the barriers formed by rapids.

93. *The Cameroons, Gabun, and Angola Areas.* The coastal rivers entering the sea between the southern frontiers of Nigeria and Angola, compared with those of the great river basins of Africa, are short and relatively unimportant. Nevertheless, there are numerous large rivers in Lower Guinea, some of which are of considerable use for navigation.

In Cameroons, the Rio del Rey in the extreme north is an important estuary, open to ships, formed by the meeting of five rivers which rise in the mountains bordering Nigeria and Cameroons, the principal of which, the Meme, is stopped by the Duben Falls 31 miles from its entrance. Farther south, the Cameroons estuary, with its important port of Duala, receives a number of rivers, of which the Wari is navigable during the rainy season as far as Yabassi, 40 miles. The Sannaga enters the sea a little farther south, but is also connected with the Cameroons estuary by the Kwakwa. It flows from the central plateau and can be ascended as far as Edea, 50 miles. The Nyong river enters the sea north of the port of Kribi. It rises in the watershed between the Nyong and the Kadei tributary of the Sanga (Congo tributary) and is an important means of internal communication, although much impeded by rapids.

The most important rivers of the Gabun Colony are

the Gabun, Ogowe, Nyanga, and Killu. The Gabun forms a great estuary stated to be one of the finest harbours on the west coast of Africa. The Ogowe rises from the high plateau in the south of the colony and runs northwards in a great curve to its mouth at Cap Lopez. On the north it is joined by the Ivindo, which rises in the south of Cameroons. These two rivers are navigable over considerable sections, and form a valuable highway into the northern portions of the Gabun colony.

In Angola, the rivers generally have a short and rapid course from the western portions of the Bihe plateau, whence they have cut their way through the coastal escarpment. The Kwanza (Coanza) is navigable for 180 miles from the coast during the wet season. The Kunene (Cunene), which runs south from the Bihe plateau, is the last important river of Africa before the Orange river is reached, some 600 miles to the south, the intervening coasts being extremely sterile. It is blocked by sand and by rapids near the coast.

94. *The South African Rivers.* The South African river system consists of one great interior basin which drains into the sea by means of the Orange river, and a number of comparatively short coastal rivers, all useless, save sometimes at their mouths, for navigation. The rivers are as a whole steeply graded, or divided into fairly level sections by rapids.

95. *Orange River.* The Orange river is fed from the mountainous country of Basutoland, where it rises in the Drakensberg range, and by the Vaal river which drains the Orange Free State and southern Transvaal. Below its confluence with the Vaal it only occasionally receives water from its tributaries, and in the lower reaches it loses more water by evaporation than it receives from the country through which it passes. Consequently it enters the sea as a comparatively

insignificant stream, although it has a total length of some 1,000 miles. Although useless for purposes of navigation, both the Orange and Vaal rivers are of value for irrigation. After leaving the steep slopes of Basutoland and the eastern portions of the Orange Free State, the Orange river is divided into long reaches between rapids, and below Upington it makes a plunge of over 400 ft. at the Aughrabies Falls, into a deep gorge with perpendicular cliffs. The Vaal tributary rises in the northern extensions of the Drakensberg, flows south of the Witwatersrand ridge and east of the Kaap plateau, and is joined by the Modder river on the left, just before its confluence with the Orange.

96. *Coastal Rivers.* The rivers qftj the west side of the Cape Province are intermittent, and only filled with water after rains. Those in the south-west, such as the Breede, Olifants, and Berg, and those rising in the escarpment running round the coasts, such as the Fish, Gamtoos, Sundays, Buffalo, and Great Kei, and the rivers of Natal, are generally rapid and subject to sudden floods after heavy rainfall, especially those from the eastern slopes of the Drakensberg. This is particularly the case with the Tugela and Umgeni rivers, on the latter of which are the Howick Falls.

97. *The Mozambique Area.* The principal drainage areas of Portuguese East Africa may be divided into those of the larger rivers which rise in the high plateau of the interior and the highlands both within and beyond the Portuguese frontiers, and have a perennial flow ; and those which rise in the zone between the highlands and the sea, and in many cases only run intermittently during the year.

With regard to navigability, most of the rivers are disappointing, as the coastal rivers partake very largely of the nature of those in South Africa, while those rising

outside the Portuguese borders do not, as a rule, offer good facilities for navigation. The Zambezi alone fulfils in some measure its early promise. Nevertheless these rivers are of great commercial value, as their lower reaches are frequently open to ships, while farther up stream they are navigated, though with difficulty, by native canoes, and thus form an important means of internal communication in a country where oxen, generally, cannot be used. Moreover, in the coastal districts, both north and south of the Zambezi, there are extensive lagoons and canals where navigation by launches is possible. One of these areas is around Quelimane. Another lies south of Inhambane.

Proceeding up the coast from south to north it is found that an important drainage area is developed behind Delagoa Bay. Part of the northern district of Natal, Swaziland, and part of the eastern Transvaal are included in this area, the head-streams rising in or beyond the broken extensions of the Drakensberg and cutting their way through the Lebombo Hills. Five rivers—the Maputo, Matolla, Tembe, Umbeluzi, and Komati—enter Delagoa Bay. The last, owing to the large curve it makes in flowing for a distance of 200 miles before entering the sea, is economically one of the most interesting rivers in the province, as it has been suggested that it might be successfully locked.

98. *Mozambique Area: Limpopo and other rivers.* Farther north the Limpopo basin includes fully one-half of the Transvaal and a considerable part of eastern Rhodesia, extending as far as the Witwatersrand on the south, and to the Matopo Hills on the north. The Limpopo rises to the west of Pretoria, not far from the sources of the Olifants river, which itself flows north-east and joins the main river in Portuguese territory. The Limpopo makes a great curve to the north-east, and

forms the western and northern boundary of the Transvaal. Where it crosses the mountain ridge on the Portuguese borders it is broken by the Tolo Azime Falls, and elsewhere rapids occur which render navigation difficult ; but it is navigable from the sea to the Changane tributary, a distance of about 93 miles.

The Inhambane river, a coastal stream ; the Sabi river, rising not far from the Matopo Hills ; the Buzi, a coastal river with a navigable estuary; and the Pungwe, also a coastal river with a navigable estuary, at the entrance of which is the important port of Beira, are practically useless for internal navigation.

North of the Zambezi the rivers of Mozambique, such as the Quelimane, Mluli or Angoche, Lurio, and Mfufi, although they contain anchorages that may be entered by small vessels, are of little use for internal navigation, while the Rovuma river, with its tributary the Lujenda, draining from the plateau east of Lake Nyasa, is apparently only of value for small canoe traffic. The Nyasa highlands west of the Lujenda-Rovuma basin fall abruptly to Lake Nyasa, and only a strip of territory a few miles broad drains to that lake.

99. *The Zambezi Basin*, The Zambezi, with its great delta, is the most important river of South Africa. It is about 1,850 miles long and drains more than 500,000 square miles. Rising in the marshy country on the south-east borders of Katanga, and flowing generally south and east, it enters the sea by a number of shallow mouths almost midway between the two ports of Beira and Quelimane. Owing to the nature of the country through which it passes, it is mainly a broad, shallow, and slow-moving stream, but where it pierces the hills or drops from the high plateau it becomes a torrent rushing through deep gorges and impossible for navigation. Flowing south-east across the Barotse plateau to the

magnificent Victoria Falls, it drops 357 ft. into a huge canon or fissure at right angles to the river which is on the line of a volcanic area stretching from the Vaal river to about 60 miles beyond the Falls. On each side of the



XIV. Victoria Falls, Zambezi

Victoria Falls the general level of the land is the same, and it is believed that at some early period the Zambezi suddenly changed its course owing to seismic action, and instead of running south to the Orange River plunged into the volcanic fissure, and after being forced to run in four contrary directions finally emerged in an easterly

course, and spread over the Rhodesian plains. From near its source to the neighbourhood of the Falls the Zambezi is navigable, with one short barrier of rapids, for some 600 miles. From below the Molele Rapids, some 150 miles from the Victoria Falls, the river again broadens out and becomes navigable for about 850 miles, as far as the Kebrabasa Rapids, with the exception of two short stretches—the Kariba or Livingstone Gorge, some 20 miles long, and the Kansalo Rapids. The Kebrabasa Rapids, 75 miles long, are about 30 miles above Tete in Portuguese territory, and are a complete stoppage to navigation, but below this barrier the river is navigable as far as the sea, though with difficulty through the narrow Lupata Gorge, a difficulty which increases as the dry season approaches.

100. *Tributaries of the Zambezi.* During its long course the Zambezi receives numerous tributaries, many of which rise from the Angola plateau and flow into the river above the Victoria Falls, forming a stream 1,000 yards broad at the Falls ; while other tributaries mainly drain from the north and enter the Zambezi on its left bank. The principal of the latter are the Kafue, which rises in the plain to the south-west of Lake Bangweolo, a broad sluggish stream available for navigation where it is not blocked by rapids ; the Luangwa, bounded on the west by a steep escarpment, and on the east by the Fort Jameson plateau ; and the Shire, which flows out of Lake Nyasa. In the extreme west of Rhodesia, the Kwando or Chobe river, rising on the plateau of Angola, joins the Zambezi above the Victoria Falls, and is stated to be navigable for considerable distances. All these rivers are internal waterways of great economic value, and will undoubtedly be largely utilized for commercial transport. In the Upper Zambezi area alone there are some 1,100 miles of useful waterways,

and the natives throughout this region are skilled boatmen.

101. *The East African Rivers.* The rivers of East Africa north of the Mozambique province are divided into those draining towards the Great Lakes and forming feeders of the Congo and Nile, and those flowing into the Indian Ocean. Of the former, the Mlagarassi drains the Tabora plateau and falls into Lake Tanganyika some distance below Kigoma. Of the latter, the principal in their order up the coast are the Lukuledi, falling into the sea at Lindi; the Matandu, entering the sea just north of Kilwa-Kivinje; the Rufigi; Kingami; Wami; Pangani; Tana; and Juba. Most of these rivers are navigable for native dhows in their lower reaches. The Rufigi is one of the few rivers in this region with a considerable delta, and can be navigated as far as the Pangani Falls, a little below its junction with the Ruaha river. The Pangani river, farther north, rises in the Kilimanjaro region, and it is blocked by a series of rapids known as the Hohnel Cataracts and the Pangani Falls (not to be confused with those on the Rufigi). The Tana river rises from the glaciers on Mount Kenya, and from the Aberdare range, and takes a great north-east and south-east curve to the sea near Witu. It is stated to be navigable for shallow launches for about 300 miles. The Juba river, flowing south from the Abyssinian highlands, is also navigable for some 320 miles, and traverses an arid region that is capable of considerable development by irrigation.

102. *Lakes.* The great lakes of Africa form a most important means of internal communication, connecting together vast stretches of territory that would otherwise be entirely dependent upon land communications, •as, fo* example, the eastern portions of Katanga and the Tanganyika plateau, and affording, eventually, when

connected by railways, an almost unrivalled means of inter-communication, comparable only with the lake system of North America.

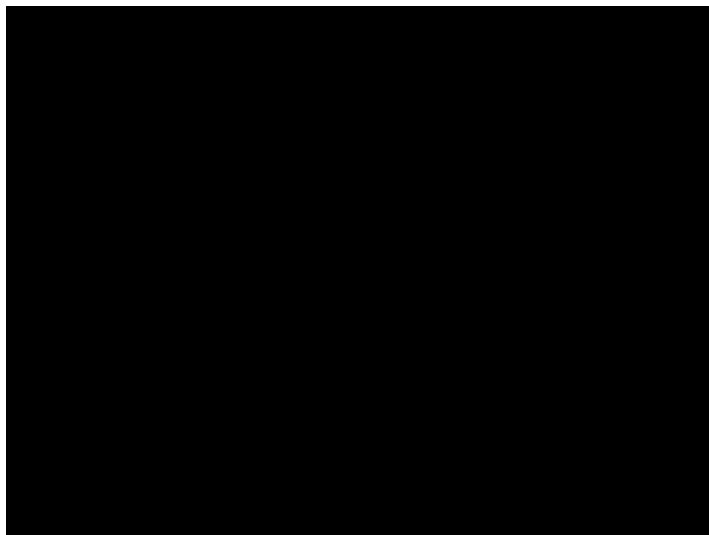
The principal lakes of Africa are situated in, or close to, the region of the great rift-valleys, and stretch in a line commencing with lakes Chilwa and Shirwa and Chiuta, in Nyasaland, to lakes Rudolph and Stephanie at the south of Abyssinia. The area in question includes some of the richest planting, agricultural and pastoral, and mining country in the continent, such as Uganda and Nyasaland for tropical plantations, Ruanda and Urundi for agricultural and pastoral enterprises, and Katanga for mining.

103. Lake Nyasa. Lakes Chilwa and Chiuta are little more than huge swamps, but Lake Nyasa, stretching northwards for 360 miles, in a deep basin (2,316 ft.) varying in width from 15 to 50 miles, is everywhere navigable, although there are few good harbours owing to the nearness of the lofty mountains and tablelands which rise on each side of the lake. Karonga, at the north end, is the port for the Stevenson Road to Lake Tanganyika. Fort Johnston is the port at the outlet of the lake.

104. Lakes Tanganyika and Kivu. Lake Tanganyika, like Nyasa, lies in a deep trough, and with the exception of the Asiatic lake Baikal, is the deepest fresh-water lake in the world, soundings of 4,190 ft. having been obtained. The shores generally, with the exception of those on the east coast, south of Kigoma, are mountainous. In this respect it resembles Lake Nyasa, but in other ways it differs considerably. The waters of Nyasa are deep blue, and those of Tanganyika green. The principal ports are on the eastern coasts. North of Lake Tanganyika the great rift is continued by the valley of the Russisi river, which flows southward out of Lake Kivji, a smaller lake, situated south of the Mufumbiro volcanic

region, and stated to be the most beautiful of the African lakes. These three lakes rise in successive tiers, Nyasa being 1,645 ft., Tanganyika 2,550 ft., and Kivu some 5,000 ft. above sea-level.

Lakes Edward and Albert Northward of Lake Kivu the level of the great rift dips rapidly to Lake Edward, 3,240 ft. above sea-level, connected with Lake Albert



XV. Lake Bangweolo

by the Semliki river, which falls 1,212 ft. in 100 miles to the level of the latter lake. On both these lakes the steep formation of the western shores continues.

105. Victoria Nyanza. To the west of lakes Kivu and Edward lies Victoria Nyanza, the largest sheet of inland water in Africa, with an area of nearly 27,000 square miles, or about the size of Scotland. Lake Victoria is at a considerably higher elevation than lakes Edward and Albert, from which it is divided by the

size but not forming a connected system like those of Central Africa. Lake Ngami (see § 87) is now little more than a swamp ; Lake Leopold II and Stanley Pool form part of the Congo system ; and Lake Chad, with its estimated area of 10,000 square miles in the dry season, has no special economic importance proper to itself. The last is much choked with vegetation, and navigation is only possible by means of the shallow channels connecting the complex system of low islands with which the lake is dotted. In Abyssinia the important Lake Tsana or Dimbea is situated on the high plateau, 5,756 ft. above sea-level, and is thus the highest large lake in Africa.

VII

ISLANDS

107. *Islands as bases for continental development.* It has been shown (see §§ 7 and 54) that the development of a country ill-provided with harbours is usually slow, and that as a whole Africa is deficient in that respect. There is, however, another factor that aids the development or occupation of countries recently discovered—the presence of numerous islands near the mainland so situated as to serve as convenient 'jumping-off' places or bases for settlement upon the neighbouring coasts. In this respect also Africa is deficient.

European enterprise in distant countries has frequently been helped by islands near the coast. This has been particularly true in Asia where Bombay, Singapore, Penang, and Hongkong have been important bases for European intercourse with the mainland ; just as, in America, Newfoundland, New York, and the West Indian islands formed important avenues of advance.

108. In Africa the islands are few, and although some of them have been used as strongholds before an advance was made towards the interior, the majority have not had any great effect upon the development of the continent. Either they are too far from the mainland, as are the Azores and Madeira ; or, when closer, as are the Canary Islands, they face an arid coast. Nevertheless, a few islands have aided in the development of the mainland, but this has been more especially the case on the eastern coasts, where some of the earliest settlements were made on islands : Mozambique, Zanzibar, and Mombasa being island settlements.

The islands off the north coast are small and unimportant. In the Gulf of Gabes, Tunisia, is the small island of Jerba, and off the Rif coast of Morocco are the Zafarani Islands, which are a Spanish possession. The western coasts are more, plentifully supplied with islands, but the more important are far from the coasts.

109. *The Azores, Madeira, and the Canary Islands.* The group of the Azores, a Portuguese possession, are over 1,000 miles from the Portuguese coast, and about the same distance from Africa. There are nine principal islands, Sao Miguel being the largest, and Terceira the most important. They are of volcanic origin, and the whole area has been one of intense volcanic activity. They rise to a considerable height above the sea, Pico, the highest, being 7,613 ft.

South-east of the Azores, in the direct track of vessels going to South Africa, is the important island of Madeira, also a Portuguese possession. It is one of the most beautiful islands in the world, and has a warm and equable climate, rendering it suitable as a home for invalids. Like the Azores, it is volcanic. It is 390 miles west of the Moroccan coast. The capital, Funchal, is on

a steep and precipitous coast, which rises towards the interior to mountains of over 6,000 ft.

South of Madeira are the Canary Islands, which have been inhabited from a very early date and, like the Azores, were known to the Carthaginians, being the Fortunate Islands of the ancients. They consist of a large number of islands, the nearest to the African coast being about 64 miles distant. The principal islands are Grand Canary, Palma, and Teneriffe. All the islands are volcanic, and show their origin in the shape of cones, craters, and beds of lava. The coasts are generally rocky and steep, and rise towards high mountains. The Peak of Teneriffe, seen far away at sea, rises to 12,200 ft as a rugged pinnacle towering above the ocean. The Canaries are a Spanish possession, and the principal towns are Santa Cruz and Orotava in Teneriffe, and Las Palmas on Grand Canary, all noted health resorts.

110. *The Cape Verd Islands and other islands of West Africa*, The Cape Verd Islands are a mountainous volcanic group, belonging to the Portuguese; and are also called on account of the green Sargassum seaweed which drifts here from the centre of the Atlantic and not because of the vegetation of the islands, as they are generally rather arid. They lie about 350 miles west of Cape Verd and include ten inhabited islands, of which the chief are Santiago, the seat of the government, Fogo, and Sao Vicente, the last an important coaling station. The highest peak, 9,157 ft., is in Fogo and was an active volcano less than 80 years ago.

South of Cape Verd is the small island of Goree, one of the important settlements and 'jumping-off' point for the neighbouring coast. Its trade has been transferred to Dakar. A little farther south, off the indented coast of Portuguese Guinea, are a large number of small islands of volcanic origin, known as the Bissagos group. The

are densely peopled and have several fine ports, but the climate is unhealthy. There are no other important islands until the large island of Fernando Po, in the Bight of Biafra, with its volcanic peak of Mount Clarence, 9,300 ft., is reached. This forms one of a string of isolated islands rising to mountain peaks, extending north-eastwards from Annobon and San Thome (see § 72).

111. *Ascension, St. Helena, and Tristan da Cunha.* Far out in the South Atlantic, off the direct line of steamships to South Africa, lie the three islands of Ascension, St. Helena, and Tristan da Cunha. The first is a purely volcanic rock, with scanty vegetation, rising from the depths of the ocean. It is an Admiralty station. St. Helena, 1,200 miles from the coast of Africa, is noted as having been the prison of Napoleon, and in the days of sailing-ships was a port of call on the way to South Africa and India. Its capital, Jamestown, is a coaling-station, and is situated on the sides of a ravine. Tristan da Cunha is a volcanic island rising 7,640 ft. above the sea, with cliffs from 300 ft. to 1,000 ft. high. There is a small population. These islands mark the outcrop of a submarine ridge in the Atlantic, extending southward from Iceland to the Antarctic Circle. The three islands are British.

Off the coast of the South-West Africa Protectorate is a number of small islands, such as Plumpudding Island and Pomona Island, famous for their deposits of guano ; and at the entrance to Table Bay is Robben Island, where there is an establishment for lepers. From this point until the coasts of Mozambique are reached, there are no important islands.

112. *The East African Islands.* The eastern coast is more plentifully provided with islands than any other part of Africa. The entrance to Delagoa Bay is protected by Inyack Island. Farther north a chain of small islands

called Bazaruto, formerly famous for their pearl fisheries, are a protective barrier for the coast, while north of the delta of the Sabi river is the small island of Chiluané. North of the Zambezi delta lies the coastal island of Mozambique, on which is built the city of Mozambique, with its ancient Portuguese fortress. The coast of Portuguese Nyasaland is fringed with coral reefs and a chain of islands known collectively as the Kerimba Islands, generally low and wooded or grassy, while Ibo, an ancient town with an indifferent harbour, is situated on an island of the same name.

Off the coast of Tanganyika Territory are three important islands—Mafia, Zanzibar, and Pemba. The two latter are the centre of the clove trade, and Zanzibar was long an outpost of the slave trade and has always been an important connecting-link between the African mainland and the Arabian and Indian coasts, as well as a base for exploring expeditions into the centre of Africa. For centuries it had been an Arab settlement under the rulers of Muscat, in Arabia, whose dominions extended along the East African coast ; it then became an independent Sultanate whose rulers claimed lordship over the neighbouring coasts, and eventually it accepted a British Protectorate.

In the southern part of the Red Sea there are numerous islands and coral reefs running parallel with the eastern and western shores. The Dahlak group lies off Massawa, and the Farisan Archipelago is near the opposite coast. In the Straits of Babel-Mandeb is the barren island of Perim, a British possession commanding the southern entrance to the Red Sea. Socotra, lying in the Indian Ocean, 150 miles from Cape Guardafui, is a large island with rugged mountains rising to 4,500 ft. It is a British possession. It is noted for its native plants, which have developed many types not found elsewhere.

113. Islands of the Indian Ocean: Madagascar. By-far the most important African island is Madagascar, the largest island in the world with the exception of Australia, Greenland, and New Guinea. It is **1,000** miles long and 225 miles broad, and has an estimated population of **3,000,000**. Madagascar lies off the coast of Mozambique, enclosing the Mozambique Channel through which moves the tide-drift of the South Indian Ocean, which setting westwards and meeting with the obstruction of Madagascar divides into two sections, the westward stream striking the African coast in the neighbourhood of Cape Delgado.

Madagascar has an average height of 4,000 ft., with a precipitous fall on the eastern side and a gentler slope in the west. In the interior are large mountains, some of which are volcanoes. The vegetation includes a large number of native species, many of which have little affinity with the African flora ; while the animal life shows an absence of many of the types peculiar to Africa. Madagascar is the home of several ancient and exceptional forms of animal life, including the lemurs and chameleons, and the remains of an immense bird have been discovered. The inhabitants also are not of the African type, but are of Malayo-Polynesian stock. They include the Hovas, who are the most civilized and powerful tribe and live in the central parts of the island. All these facts point to a long severance from the continent of Africa.

The chief port of Madagascar is Tamatave on the eastern coast, facing the Indian Ocean, and the capital is Antananarivo in the centre of the island. ,On the north-east coast is the important harbour of Diego Suarez, a French naval station, and on the opposite side is the small island of Nossi-Be, with its **port** Hellville.

114. *Comoro Islands, Seychelle\$, and Mauritiu\$.* Farther west are the Comoro Islands and Mayotte, lying between Cape Delgado and Madagascar, also French possessions. They are of volcanic origin and are mountainous. North-east and stretching towards the Equator are numerous islands and groups, extending from Aldabra Island to the Seychelles Archipelago. The latter is a British possession, enjoying a delightful climate, and very fertile. The largest and most important island is Mah[^], which rises to a height of 3,000 ft. The intervening groups include the Amirantes, Providence, and Farquhar islands, all of volcanic origin.

Far out in the Indian Ocean to the east of Madagascar lies the group known collectively as the Mascarene Islands. The principal are Mauritius, formerly a French possession known as the He de France, but now a British colony; Reunion, formerly He de Bourbon, a French possession; and Rodriguez, a dependency of Mauritius, from which it is 380 miles distant. Mauritius is a very important possession both from the strategic and commercial points of view. It is very fertile, and exports large quantities of sugar. The capital, Port Louis, has a fine harbour, which adds greatly to the value of Mauritius as an outpost of the British Empire in the Indian Ocean. Like Madagascar, the Mascarene Islands are noted as having been the home of many extinct animals, including large birds, incapable of flight, such as the dodo. The animals and plants of these islands, including Madagascar, have a close affinity with those of South America. The reason for this connexion has not yet been determined.

VIII

CLIMATE, VEGETATION, ANIMAL LIFE

115. *Climatic Zones.* As Africa is almost bisected by the Equator, a large part of the continent experiences a high temperature. For the same reason the climatic differences are much less extreme than in other continents, although the compact shape of the land-mass prevents large areas from benefiting from the moderating influences of moist winds and increases the seasonal and diurnal range of temperature in the parts outside the equatorial region.

Both the northern and southern extremities of Africa are fairly temperate regions, that in the north-west being defined by the Atlas ranges, to the north of which the country belongs climatically as well as topographically to the Mediterranean basin, and resembles southern Europe rather than the rest of the continent.

In the more temperate regions the seasons are differentiated by temperature, but in the hot zone the rainfall determines the seasons. For this reason the distribution of rainfall is a predominating feature of the African climate, the range of temperature being a secondary consideration in those regions that lie immediately north and south of the Equator. In the areas about the Tropics of Cancer and Capricorn the extraordinary heat of summer is partly due to the absence of moisture and clouds, and partly to the barren nature of the ground in the deserts which receive and radiate heat more quickly than land covered with vegetation.

In the middle equatorial region the mean annual temperature varies within comparatively small limits, although there are differences in the distribution through-

izo Climate, Vegetation, Animal Life

out the year, and also differences due to the height of land. In the immediate neighbourhood of the Equator, and more especially in the coastal regions and the Congo basin, the climate generally is equable ; but on the elevated eastern plateaus there is a much greater range between summer and winter and between day and night. The Equator itself, owing to the presence of an almost continuous belt of clouds, does not mark the thermal or heat equator, which is pushed considerably north of the terrestrial equator. The heat equator extends from Sierra Leone, passes north of the great bend of the Niger, and curves gradually until it reaches the shores of the Red Sea about the latitude of Jibuti (11° N.) ; and the absolute extremes of temperature are not to be found in the neighbourhoods of Libreville, Stanleyville, or Entebbe, but in the area lying between 10° and 20° N. lat.

The cloud-ring which screens the rays of the sun from equatorial Africa moves north and south as it follows the path of the sun, the extreme limits being about 18° N. and 10° S. The mid-region is marked by a belt of equatorial calms.

116. *Rains.* Far more important than the differences in temperature are the variations between the seasonal distribution of rainfall. Bordering upon the north and south temperate zones are regions of smallest rainfall, where desert and arid conditions prevail, and between these regions lies, in the main, the area of greatest rainfall. The rains follow in the track of the sun, except in the equatorial regions where they are almost continuous, and it therefore follows that the tropical regions are divided into three areas of rainfall. At some distance from the Equator all the rain falls at one period of the year, the wet season beginning soon after the sun becomes vertical, and lasting for two

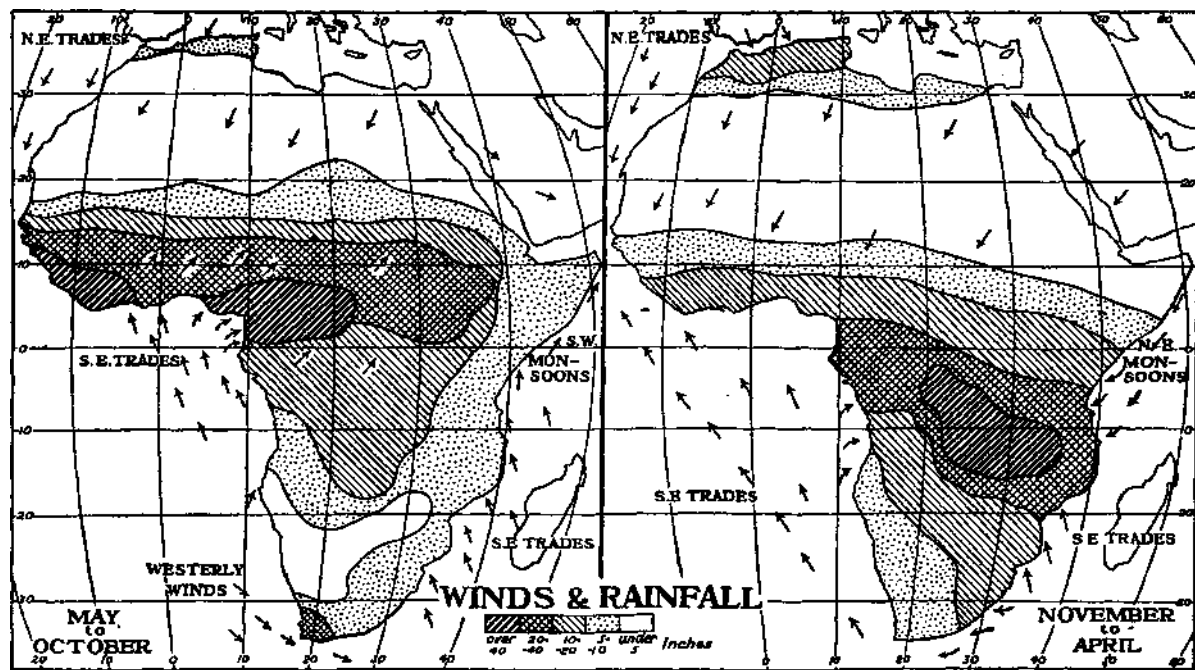


FIG. 12

FIG. 13

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or three months, while the rest of the year is dry. Farther inland towards the Equator, owing to the fact that the sun is vertical twice during the year during its passage north and south (it is vertical at the Equator during March and September), there are two well-defined rainy seasons ; the rains being of longer duration and greater intensity, especially in the southern hemisphere, as the sun passes from the southern tropic to the northern.

In the period from May to October the rainiest area is found in the coastal region from about the latitude of Freetown to the borders of Dahomey, and then from the delta of the Niger to the Ubangui river, with a very wet area stretching from the Gambia river to the highlands of Abyssinia, and reaching southwards almost to the Equator. In the period from November to April, when the sun is south of the Equator, the great area of rainfall is in the basin of the Congo and the Great Lakes district, with the wettest area stretching right across Africa from the Cameroons Mountains to Lake Victoria and from the mouth of the Congo, in a south-easterly curve, to the mouth of the Zambezi. In the areas of greatest rainfall the amount of rain always exceeds 40 in., and in many regions, such as the Niger delta, the Congo basin, and the Sierra Leone-French Guinea area, it is very much greater.

Elsewhere in Africa the rainfall is distributed over wide areas, especially on the eastern plateaus and the south-eastern coast-lands, and on the west coast down to the neighbourhood of Lobito Bay, during the southern summer, when from 20 to 30 in. is the normal rainfall, with a favoured region in the extreme south-west of the Cape Province, where the mountains catch the rain brought by the westerly winds blowing over the Atlantic Ocean. In this last region the rain falls mainly during the

southern winter. In South Africa, and more particularly in the Union territory, there is a great variation with regard to the time of the year during which the rains fall, as well as in the amount of the rainfall, as between the western and eastern coasts.

In the north-west of the continent rain falls during the winter months, and very little during the summer season.

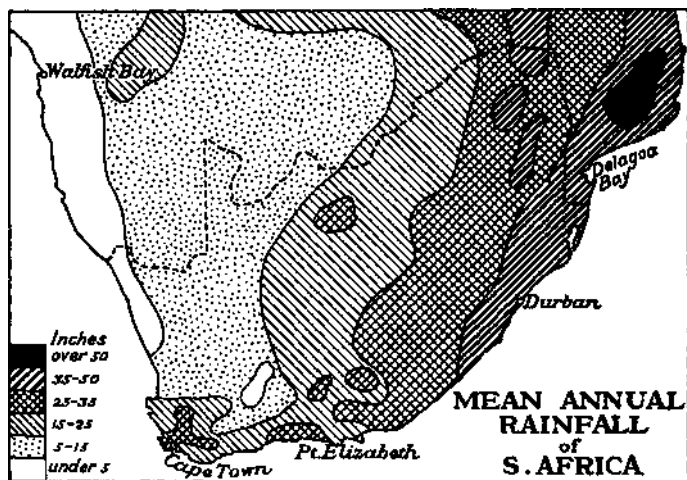


FIG. 14

117. *Winds and Rains.* Winds blow from regions of high or great atmospheric pressure, i. e. from cold regions, to regions where the pressure is less. Since land changes its temperature more rapidly than water, retaining heat for a less period and vice versa, a land-mass becomes in summer an area of low pressure, towards which winds will blow, and hot air being lighter than cold the great land-mass of Africa during the period of greatest land-heat attracts winds which seek the areas of lowest pressure. It follows, therefore,

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that during the southern summer, winds blowing across the Indian Ocean converge in Central Africa, towards which blow the north-east monsoons and south-east trade winds, and on the west coasts the south-east trade winds, which, towards the equatorial regions, are deflected towards the land in a north-easterly direction (being then south-westerly winds). In the season of greatest heat, therefore, these moisture-laden winds arrive on the African coasts and pass inland with their burden of rain. During the northern winter also the south-east trade winds from over the Atlantic are deflected inland to the hot regions on the coasts of the Gulf of Guinea, bringing moisture with them.

118. *Prevailing Winds.* Over the north of Africa the prevailing winds come from the north, but the westerly winds which blow over north-west Europe do not bring moisture to the Sahara regions, as in ascending to a higher level over the Atlas ranges they are cooled, so that their moisture is precipitated before they reach the central plains. Similarly the north-east winds which bring rain to Abyssinia, passing mainly over land, bring little or no rain to the Sahara and the northern Sudan. In the same manner the south-east trade winds bringing abundant moisture from the Indian Ocean precipitate their rainfall on the mountains and elevated plateaus of eastern Africa, but exhaust their moisture as the more westerly regions of southern Africa are reached; while in the southern winter the tendency of air to move outwards from the interior reduces the influence of these prevailing winds.

The oceans on both sides of Africa are areas of high pressure generally, the belts of relatively high pressure occurring about the latitude of 30° north and south of the Equator, whence the winds blow outwards to the Equator. Owing to the rotation of the earth these

winds are turned from their direct paths, being deflected to the right hand of their path in the northern hemisphere and to the left in the southern hemisphere, resulting in the southern hemisphere in the south-east winds and in the northern hemisphere in the north-east winds. These winds shift somewhat with the seasons, and it happens, therefore, that the north-east monsoons during the southern summer reach the northern half of Mozambique, while the south-east winds during the northern summer are carried towards the western and central Sudan.

119. *South African Winds.* Throughout South Africa, rainfall in the interior mainly comes with thunderstorms. Such storms are also frequent on the eastern slopes of the plateau, where, as on the High Veld, the accompanying rainfall is sometimes of great intensity and violence. Thus throughout South Africa what are wrongly termed cloud bursts are of frequent occurrence, and where these occur close to the coasts an enormous amount of water rushes away uselessly to the sea. In the south of the continent the convergence of the south-west and south-east winds results in wind storms of great violence, which at an earlier period earned for the Cape of Good Hope the name of Cabo Tormentoso (Cape of Storms).

120. *Saharan Climate.* In the immense region of the Sahara there is an enormous range of temperature throughout the day. In the northern areas during winter the thermometer frequently sinks below freezing-point at night and rises in the daytime to over 100° F. The winds are strong, and seem to blow from every quarter of the compass. On the high plateaus of the central Sahara the almost complete absence of all flora and fauna is largely due to this enormous range of temperature and the incessant winds. In the Ahaggar

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highlands, where rains of great intensity may fall once in three or four years, the variation of temperature is excessive. Farther south, in the Air region, rains fall every year, and sometimes three or four times in the year. Here, though the rainfall is quite uncertain as to season, the storms are heavy when they do occur, and dry watercourses become torrents which soon lose themselves in the sands. Similarly in the southern Sahara, both north and north-east of the Niger bend, on the Tilimassi-Niger plain, there are tropical rains, which, however, are of little benefit to the region as a whole. In general the climate of the Sahara, unfriendly to the existence of flora and fauna, is healthy for man, as the air is perfectly dry and there is practically no humidity.

121. *Climate and European Settlement* The greater part of Africa is not suitable for the permanent settlement of Europeans. Throughout the more temperate regions of northern Africa, where European races can thrive, there is a large Arab and Berber population. Nevertheless in many parts there are ample openings for Europeans. In Morocco large European communities are becoming established, but mainly in the cities and ports, particularly at Casablanca. Similarly throughout Algeria and Tunisia the cities and towns contain large resident European populations, and Europeans are also largely engaged in agricultural occupations. In Algeria and Tunisia the immigrant population is largely French, but in Tunisia there is also a large Italian element, mainly of the labouring class. Tripolitania is being opened to settlement by Italians, and Egypt contains a cosmopolitan intrusion of French, Greeks, Italians, and British, almost exclusively engaged in trade and commerce.

In the rest of Africa the main areas where European

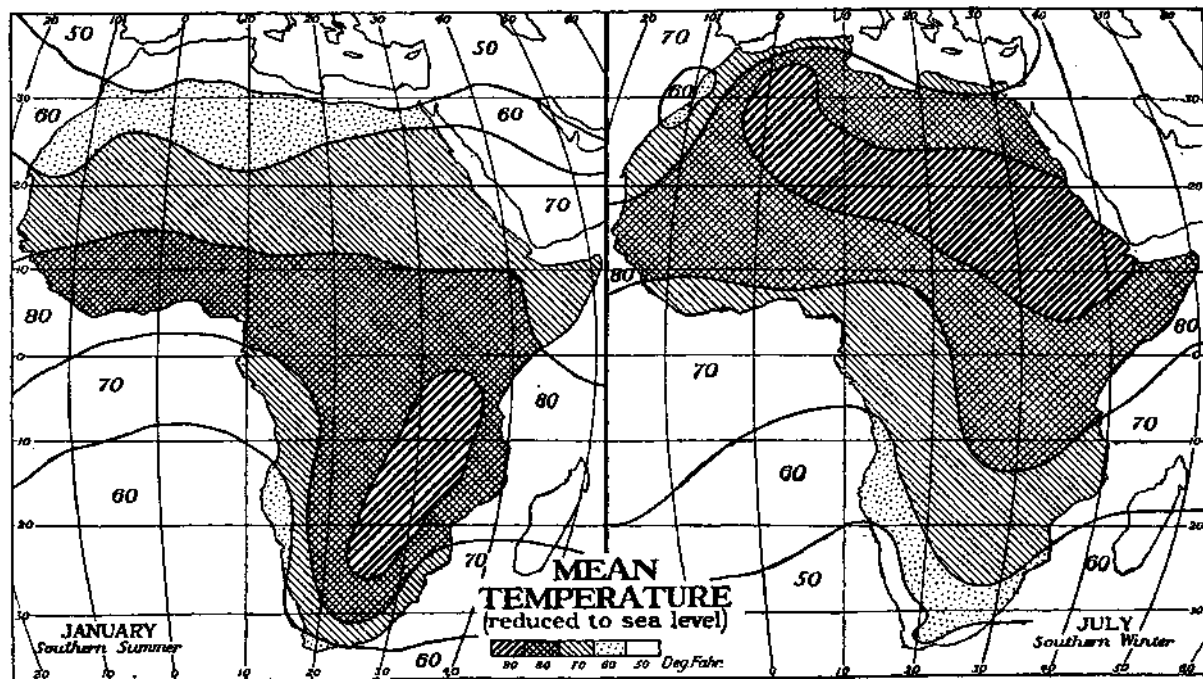


FIG. 15

FIG. 10

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communities can settle are the Union of South Africa, the highlands of Southern Rhodesia, which include the high country of the Limpopo-Zambezi watershed, and the highlands of East Africa, including those of the Congo-Zambezi watershed and the Nile-Congo watershed. To this area may be added the high plateau of southern Angola. It appears, therefore, that generally considered, white settlement outside the southern and northern regions is possible in an area stretching roughly from north of Lobito Bay, across Angola, through Katanga, and thence across the Nyasa-Tanganyika plateau to the East African coasts north of the Rovuma river and south of Kismayu. To this region must be added Abyssinia. Within this area there are numerous favoured localities, such as the Bihe plateau of Angola, the plateau of Kenya Colony (especially the Uasin Gishu plateau), and the higher country of Tanganyika Territory, and probably Ruanda and the regions lying west of Lake Albert, where Europeans can thrive. It remains to be seen, however, whether future generations can be reared without constant influx of new blood or numerous visits to more temperate lands. Moreover, within this area, generally speaking, the native population is not large, except in Abyssinia and Ruanda, and Europeans would be able to settle, as in South Africa, in proximity to the native peoples.

122. *Vegetation.* There are six types of vegetation in Africa, each merging into and overlapping its neighbour. These types depend in the main upon special climatic conditions, not the least important of which is rainfall. It thus happens that, for instance, the greatest forest areas occur in the regions of tropical rainfall. The six main types are as follows.

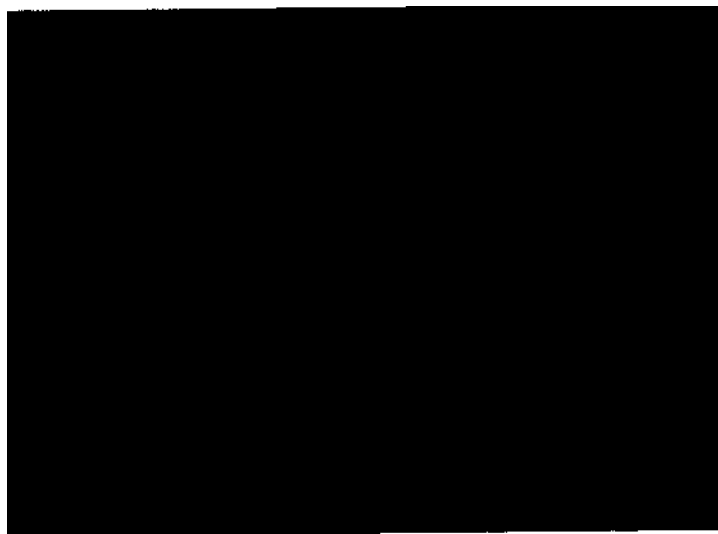
* 123. *Mediterranean Vegetation.* As its name implies, the Mediterranean vegetation closely approximates to

the flora of southern Europe, and it is found in the extreme north-west and in the extreme south-west of the continent, the Atlas regions more especially forming part of the south European botanical zone. Plants which can obtain moisture from a considerable depth, and are thus conditioned to withstand the summer drought, are typical of these areas. These include the vine, Karroo bush, and alfa or esparto grass, which is exported in great quantities from Algeria. The olive, laurel, citron, orange, almond, fig-tree, oleander, cork, and varieties of the oak are characteristic, many of these having thick leaves or leaves with small surfaces designed to check the evaporation of moisture. Other plants have bulbous roots, and so are able to store up moisture ; but cereals, which do well in these parts, have to be sown so as to benefit by the rains during the early days of their growth. In the southern oases the date palm, very largely dependent upon underground moisture, furnishes both food and wealth to the inhabitants.

124. *Desert Vegetation.* South of the Atlas region begins the desert flora, which commences in the regions where the mimosa, acacias, and tamarisks flourish along the wadis where moisture lingers. The proper desert vegetation consists of two classes : (1) that which springs up after the occasional showers, and (2) that which depends mainly upon underground moisture and is therefore perennial. The first is of extremely rapid growth, and as quickly withers away. The second consists of trees, shrubs, and plants with succulent and thorny stems and leaves, as well as the mimosa and tamarisk already mentioned. On the slopes of the Ahaggar Mountains, in the heart of the Sahara, the tamarind flourishes, and the baobab begins to appear in the extreme south of Nubia.

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125. *Grass- and Scrub-lands.* The grass-lands and scrub-lands form the intermediate districts between the desert regions and the area of savanna, and occur over large districts of eastern and southern Africa and in the north of the Sudan, where the rainfall is scanty but sufficient to provide sustenance for flocks and herds, as on the Karroo in South Africa and in areas in the northern Sudan. The grass grows plentifully after



XVI. Savanna, Tanganyika Territory

rains, but it is soon exhausted when the long period of drought occurs, and flocks and herds have to be moved to more favoured regions.

126. *Savannas.* The savannas, or regions of mixed grass and stunted trees and bushes, are of a better type than the grass- and scrublands. They extend north, east, and south of the Congo basin with a definite continuity that has promoted a similarity of fauna over the greater part of Africa south of the Sahara. On the

savannas trees grow in clumps or along the banks of rivers, and the vegetation includes the baobab, many kinds of agaves and tree-like euphorbias, and fleshy leafless mesembryanthemums, all of which are also found in semi-desert areas. The savannas extend throughout the Sudan, on the high plateaus of eastern Africa, and through much of South Africa and Angola ; and large areas within these regions are suited for agriculture, either with or without irrigation.

127. *Forest Regions.* Throughout the whole of the coastal regions of Upper Guinea, exclusive of the swampy areas of the lagoons, and extending for many miles inland, is a vast region of tropical forests, continuing across Nigeria to the neighbourhood of Rio del Rey and thence broadening out into the vast forest zone of Cameroons, the Gabun Colony, French Equatorial Africa, and Belgian Congo. Here the trees are evergreen, and often form an impenetrable cover both for the inferior races of mankind, such as the Pygmies, who have sought refuge there, and for certain classes of animals. The Ituri forests, west of the Semliki river, cover an immense area in the Belgian Congo.

In all these forests there is naturally great variety of timber, according to the situation of the forests in the tropical coastlands or in the highlands of the interior. The chief rubber forests are near the coasts or in the neighbourhood of the Great Lakes. In East Africa the forest areas are not so extensive, but are found along the coasts and on the slopes of the mountains : cedar, camphor, jarrah, and numerous yellow woods being typical. Among exotics the eucalyptus and wattle have been introduced, the latter also being grown in Natal for commercial purposes. The most valuable forest lands are on the slopes of Mount Kenya, on the Mau escarpment, and in the Usambara highlands.

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Mangrove forests extend along the coasts. Here when the tide recedes, the roots of the mangrove stand partly out of the water, vertical offshoots supplying air to the

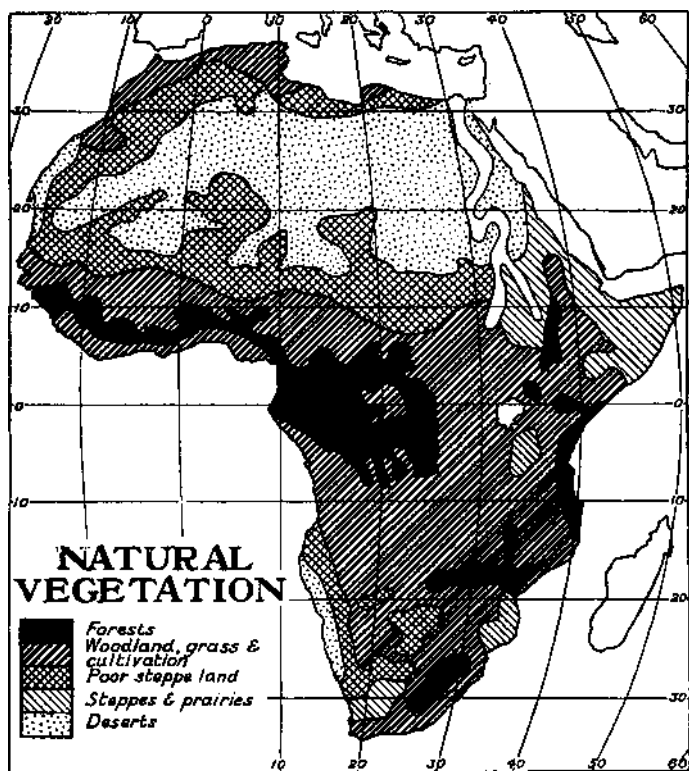


FIG. 17

submerged roots. Uganda also contains numerous forests, especially the Toro forest on the western shores of Lake Victoria and the forests in the Ruwenzori range. Extensive forests also occur in Mozambique, especially along the Zambezi and Shire rivers, but the only important forest area in South Africa is in Natal on the slopes

of the Drakensberg Mountains, although there are numerous small forestal areas in the Transkeian districts and throughout the region known as the Thorn-



XVII. Forest, Palm Grove, Victoria Falls

veld, Bush-veld, and Middle-veld. The forests of Rhodesia and Angola have little commercial value.

In the northern parts of Africa many portions of Abyssinia are heavily timbered, and there are forests in certain districts along the White Nile in the south of the Anglo-Egyptian Sudan; but the forests of Algeria and Tunisia have largely disappeared, although

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there are still extensive forest areas in Morocco, where the trees are closely related to the Iberian (Spanish) flora, and include evergreen oaks, the sanobar, carob, cedar, and acacia.

128. *Types of Forests.* The forests of Africa either consist of continuous masses of trees which in the equatorial regions become of the jungle type, dense masses of vegetation being bound together by many species of climbing plants ; or are of an 'avenue' type, growing only along the banks of rivers, as in the south of the Anglo-Egyptian Sudan; or are of the 'island' type, growing in clumps in the midst of savanna or grass country. The last type is frequent on the East and North and South African plateaus. In the mountain areas the types of vegetation vary according to the height. Thus in the Ruwenzori range there is a savanna zone up to about 6,500 ft., succeeded by dense equatorial forest up to 8,000 ft., and bamboos up to 9,800 ft. These are followed by forests with laurels and ferns, mosses and lichens, up to the 12,000 ft. level, when open grass slopes again succeed almost to the snow-line, choked with giant groundsel and lobelia, and degenerating into water-logged tundras as the snow is approached.

129. *Alpine Flora.* In addition to the usual economic plants (both exotic and native) of Africa, such as cotton, tobacco, coffee, bananas, sugar, rice, and most of the tropical plants known to commerce, and the vegetation for which no economic use has yet been found, there is an Alpine flora on the higher peaks of East Africa, Abyssinia, and Cameroons, where some of the plants resemble those of the Swiss Alps, and others are peculiar to Africa.

130. *Vegetation and Scenery.* The great forest region of Central Africa has been vividly described by Stanley, the explorer, who for 160 days marched through the

forest, bush, and jungle, without having seen any grasslands. He passed through forests covering an area as large as the whole of France and Spain, closely packed with trees varying in height from 20 ft. to 180 ft., whose crowns of foliage were interlaced in dense masses and prevented any view of sun or sky. The trees were from a few inches to four feet in diameter, and they



XVIII. East African bush, Rovuma River, Tanganyika Territory

were bound together by the coils of climbing plants, whilst the ground was covered with a thick and almost impenetrable carpet of vegetation.

The scenery of so enormous a continent as Africa must necessarily be very various. Nevertheless there is a prevailing sameness over vast areas, due partly to the African types of vegetation, partly to the geological factors that have produced the surface features, and partly to atmospheric conditions and colouring.

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In desert regions where the sun beats fiercely on the surface of bare rocks or sand, mirages are frequent, and the appearance of water, where no water exists, is so well defined that even experienced travellers have been deceived. In the midst of the desert the appearance of a large sheet of water may be seen, fringed with palms and vegetation, which vanishes when approached by the traveller.

The scenery of Africa ranges from rugged and precipitous mountains, sometimes, even on the Equator, crested with snow, and frequently clothed with dense forests, to seemingly endless and monotonous plain, covered with high grass shutting out the view; from equatorial forests, choked with dense masses of vegetation, to arid deserts in which plant life is almost or quite impossible; from highlands weathered into the round or square-topped hills so characteristic of many parts of the plateau, to swampy depressions, the home of enormous numbers of birds and affording shelter to many kinds of animals; and from the luxuriant shores of tropical lakes to the arid coasts of much of northern and western Africa.

Throughout a great part of South Africa the series of broad and sweeping tablelands, covered with short grass as in the Orange Free State and the Transvaal; the Great Karroo with its recurring low hills (kopjes) and scrubby bush; the low bush country in the east, with grass 10 ft. high; or the veld with its monotonous but unending charm, brilliant with flowers at certain seasons of the year, are types of the varied scenery of the sub-continent and elsewhere, the beauty of which is increased by the richness of the sunrises and sunsets, with the violet after-glow of night.

131. *Animal Life.* The Sahara has been so strong a "barrier against the dispersal of animal life in Africa

that it forms the division between two great zoological regions. North of it the fauna is largely common with *that of Europe and northern Asia, known generally as the Palaearctic ; south of it is the Ethiopian or African fauna proper. These two great divisions are practically distinct, and animals that are common to the two have crossed the Sahara by means of the Tibesti plateau-bridge, or have travelled along the narrow valley of the Nile, or, as is the case with most domestic animals, have been introduced by man. Thus the camel, which has proved indispensable in the Sahara on account of its wonderful adaptability to desert conditions, has also been introduced into other parts of Africa, such as north-east Rhodesia, the Kalahari Desert, and the South-West Africa Protectorate, and is invaluable for purposes of transit and transport in many parts of the Sudan and Egypt. It is able to exist for considerable periods without water, and many desert routes could not be traversed without its aid.

132. *Animal Migrations.* At a period well within the human era, the mammals of Algeria, Morocco, and Tunisia closely resembled those of South and Eastern Africa at the present day, and although animals have less opportunities for dispersal than plants, they can accommodate themselves much more readily to what might be considered adverse climatic conditions. When, however, owing to the increasing cold, the food-supply becomes less plentiful or altogether ceases, great migrations of animals take place. This has happened in Africa in common with other continents, and the two important routes mentioned above have been traversed by animals seeking a refuge from the oncoming ice which at one period invaded northern Africa. In this way the white rhinoceros, many of the antelopes, the African elephant, the buffalo, the eland, and the hyaeria

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have made their way to the then more favoured regions of the continent—and it is possible that the negro and negroid types of man either journeyed with them or followed in their wake. This was a slow and gradual process spread over many centuries or perhaps thousands of years : but in any case it is certain that these slow migrations took place, and equally true that in certain cases they were stopped by topographical conditions, which put a limit to the areas of migration. Thus neither chimpanzees nor gorillas ever appear to have crossed to the south or west of the main stream of the Congo.

The routes of animal migration converged in one of the most interesting regions of Africa, the country known as the Albertine rift-valley, where the abrupt change of flora and fauna is most clearly contrasted, for on the eastern side the dense forest abruptly changes into those grassy plains which form the ideal home for antelopes, zebras, big-horned buffaloes, and rhinoceroses. In this region of Africa many types of plants, animals, and men converge and intermingle.

Periodical migrations of animals have also taken place, and still occur on a smaller scale. These are caused either by seasonal changes of climate causing the vegetation to disappear or by the prolonged absence of rains. In this way millions of animals, particularly the springbok, used to leave the arid Kalahari in search of fresh pastures—a habit or necessity which eventually proved fatal to them, since the farmers of South Africa found these periodical migrations an excellent opportunity for sport, and frequently hundreds, and sometimes thousands, of game were shot in one day.

133. *The Antelopes.* The wild animals of Africa may be divided into two large groups, merging into each other but nevertheless fairly well defined—those of the

savannas, grass-lands, and scrub, and those of the tropical forests. Among the most characteristic groups in the former areas are the antelopes, which include such species as the eland—one of the largest antelopes in the world—the Cape hartebeest, which ranges south of the Limpopo, and the numerous other varieties of this animal which are found north of the Zambezi, in the highlands of East Africa, and in Abyssinia ; the gnu or wildebeest, now practically extinct south of the Vaal ; the duiker, present all over Africa ; the oribi, common in East Africa and in the eastern Sudan ; the spring-buck, common to the open treeless plains of South Africa ; and the koodoo, a large animal plentiful all over the eastern parts of Africa. Although antelopes are so common, there are no deer in Africa.

134. *Other Herbivorous Animals.* There are numerous other large herbivorous (plant-eating) animals, such as the giraffe, most plentiful in East Africa and Somaliland, and though not extinct in South Africa, only inhabiting the driest and most inaccessible parts ; the okapi, an animal closely allied to the giraffe, which has sought shelter in the densest parts of the Semliki forests ; the zebra, once common in South Africa but now almost extinct there, though still plentiful along the rift valleys of East Africa and in the southern provinces of the Anglo-Egyptian Sudan ; the wild ass, more or less confined to Somaliland and the Red Sea provinces of the Sudan ; the hippopotamus, described by Herodotus and once common in most parts of Africa, but now confined to the more tropical regions ; the rhinoceros ; the buffalo, practically extinct south of the Limpopo, but common in the marshy districts of the eastern littoral of Africa, in Uganda, the southern Sudan, Angola, the Belgian Congo, Senegal, and around Lake Chad ; and the elephant. This last animal wanders

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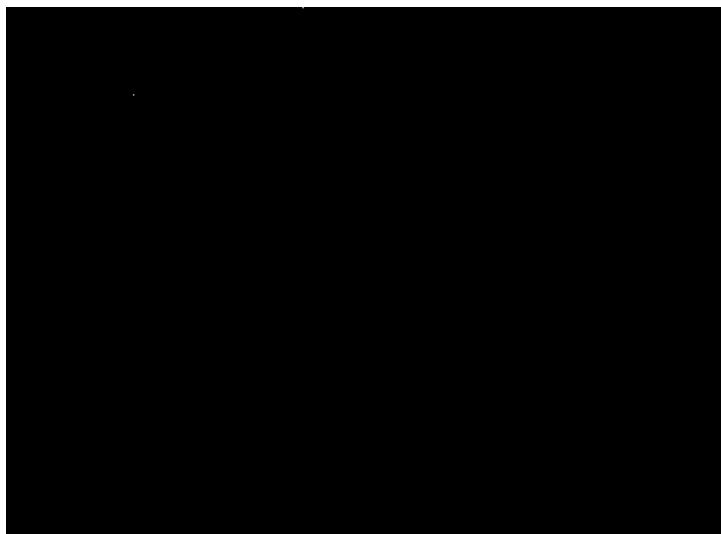
both on the savannas and in the forest regions, but is practically extinct south of the Zambezi, except on the east coast around the Pungwe river and in a few districts in Rhodesia. In Kenya Colony and Uganda large herds are not infrequent, but it is most plentiful in the Belgian Congo, the Bahr el-Ghazal province of the Anglo-Egyptian Sudan, along the White Nile, and in Abyssinia. Since the days of Hannibal, when it was trained for warfare, until recently, the African elephant has not been trained for draught purposes, but experiments in the Belgian Congo have met with some success. In South Africa a few elephants were preserved until recently in the Knysna and Addo districts of the Cape Province. In the quest for ivory vast numbers of elephants are killed annually, and in spite of stringent game laws, the period when they will become extinct seems not far distant.

Of the above animals the giraffe, zebra, hippopotamus, and okapi are peculiar to Africa. Bears are stated to exist in the mountains of eastern Morocco.

135. *Carnivorous Animals.* Of the carnivora (flesh-eaters) the principal is the lion, still found in Zululand and the north of the Transvaal, but more numerous north of the Limpopo, and extending throughout Africa into the Sudan. Others are the leopard (called the 'tyger' by the Boers); cheetah (called the 'luipaard' by the Boers); the lynx or caracal; the hyaena; and the jackal, which takes the place of the European fox. Closely allied to the jackal is the Abyssinian wolf. The wild species of cat, known as the Egyptian cat, ranges over Africa, and was probably the original species from which the domestic cat has been evolved.

136. *Forest and River Animals.* In the great forests of Africa are numerous species of monkeys and anthropoid (man-like) apes, such as the gorilla and chimpanzee,

while baboons are found in troops all over Africa, both in bushy and open country, and include the ugly mandrill of western Africa. The gorilla, the largest and most formidable of all the apes, dwells in the vast forests of the Gabun Colony, and ranges between the Mufumbiro volcanic region on the east (almost on the borders of Uganda) and the Atlantic coasts on the west ;



XIX. Ostriches on the Karroo

but the chimpanzee has a wider range throughout the equatorial regions of western Africa and thence into the heart of the continent. As a rule, however, the forests, where dense, are devoid of animal life, except snakes. These are found throughout Africa, numerous varieties, such as the mamba, puff adder, and cobra, being highly poisonous. Boa constrictors and pythons are also plentiful. The crocodile and hippopotamus inhabit marshes and rivers. The latter still exists m

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the rivers of south-east Africa, and is plentiful in many other parts of Africa.

137. *Birds.* The largest bird of Africa is the ostrich, still running wild in some parts of the Union of South Africa, but preserved for its feathers in many districts, particularly around Oudtshoorn. In eastern Africa it is plentiful, and it is also common in Somaliland and in parts of the Nile valley. In the forests there are many varieties of parrot, and game birds of all kinds are plentiful throughout Africa. The common guinea-fowl comes from West Africa.

138. *Destruction of Animal Life.* In most of the African colonies game laws have been introduced, and in some there are large reserves in which the game is protected. The larger animals, however, are gradually being exterminated owing to the advent of Europeans armed with guns; the primitive hunting methods of the natives having had little effect on the African fauna previous to the period of European expansion. South Africa, which at one time teemed with all kinds of wild animals, including the lion, hippopotamus, elephant, and hyaena, is now practically free from the more dangerous varieties, which have either been killed or have retreated into other regions owing to climatic changes. But numerous vast districts still remain in Africa where there is an enormous amount of animal life—more particularly on the great open plains of East Africa, in Somaliland, and much of the Sudan, including Kordofan and Darfur.

IX

PEOPLE

139. *The Caucasians and Negroes*, There is much uncertainty regarding the origins of the different African races, and authorities differ considerably in their estimates of the course and direction of the great migrations that have undoubtedly taken place. It is not, therefore, to be assumed that theories held at the present time will not subsequently be modified, or perhaps entirely changed, as fresh evidences are brought to light (see also § 46).

The natives of Africa can be divided into two great families, those belonging to the Caucasian races (Semites, Hamites, and Europeans), and those belonging to the negro and negrito races ; but there is no classification that will exactly fit all the different peoples and tribes, because there have been constant intrusions and migrations on the African continent, resulting in racial mixtures. During the glacial period, tribes of wanderers moved southwards from central Europe, possibly originally coming there from western Siberia, into northern Africa, and these northern types of men mingled with the negroes and Bushmen, and produced a mixture that is now known as the Hamitic race. These men crossed the Sahara by the Tibesti plateau or along the western coasts, driving the earlier races before them, and it is possible that these earlier races, the negro and negroid types, had in their turn entered Africa from Arabia by way of the Red Sea rift valley.

140. *Hamites*. The origin of the Hamitic peoples of Africa is unknown, but, as stated above, they are believed to have had a European or western Asiatic

origin. They include the Berbers, who form a great part of the population in Morocco and Algeria; the Fellahin or peasants of Egypt; and certain tribes in the Sahara, such as the Tuareg. They are mainly employed in agriculture, and like the Semites were converted to Mohammedanism when the great Saracenic invasions of the sixth and seventh centuries swept away the last remains of Roman civilization from northern Africa. The Hamitic races differ from the Semites in having rounder faces, but owing to constant inter-marriage racial characteristics are much confused, and it is frequently impossible to determine the true racial origin of any particular tribe. The Fulas, of western Africa, who form a cattle-keeping aristocracy, are more Hamitic in their characteristics than their immediate negroid neighbours. The Hamitic and Semitic peoples have modified their Caucasian characteristics by inter-marriage with negro races. Thus the Abyssinians, Nubians, Somali, and Galla who inhabit the Ethiopian region, although distinctly characteristic races of Caucasian type, have a darker hue, especially in the case of the Nubians and Galla.

141. *The Semites.* After the Hamitic peoples were established, there was invasion after invasion of Semitic peoples from Arabia, who fused with the Hamites in Abyssinia and the valley of the Nile, and became what are known as the ancient Egyptians. The Semites include the Arabs, who form the aristocratic class in Egypt, throughout northern Africa generally, and along the coasts of north-eastern Africa. Where they are nomadic in habits they are generally called Beduins, and are confined to the Sahara and the more arid portions of northern Africa. Traces of Semitic civilization and influence are found down the eastern coasts of Africa, as far inland as the Great Lakes, and on the

plateau of Rhodesia, where the Great Zimbabwe and numerous other ruins are generally regarded as the work of Semitic invaders. This incursion from Arabia

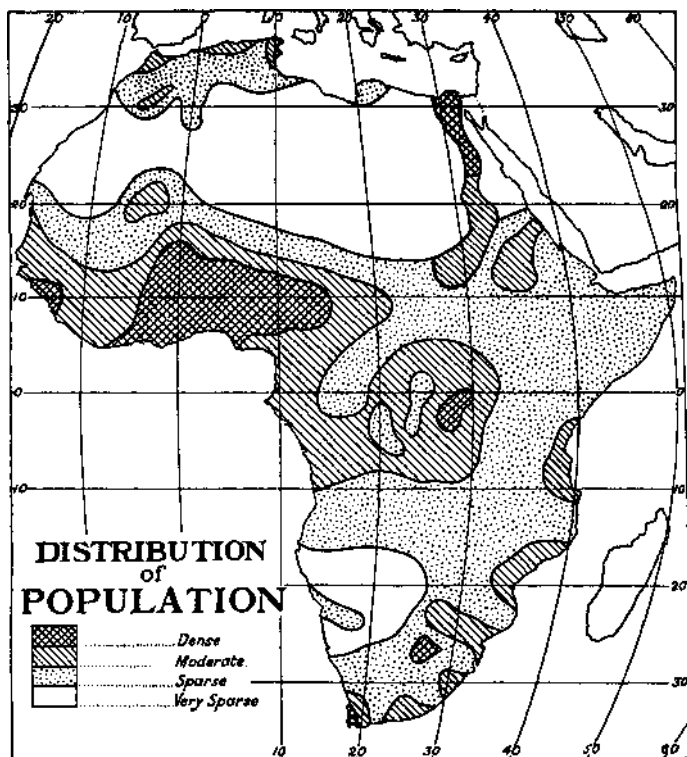


FIG. 18

has been continuous until comparatively recent times. In Morocco and the cities of northern Africa are African Jews of very long standing. It must be noted that both Hamites and Semites are types of people, and that there is no tribe or nation called by these names.

142. Europeans. The modern European element in

Africa is of recent introduction. The Boers of South Africa are descended from the Dutch and French Huguenot colonists of the seventeenth and eighteenth centuries, and are the only European race, apart from the descendants of (modern) Greek traders in Egypt and half-caste Portuguese colonists in western and eastern Africa, who have a long connexion with the African continent. All others, such as the British in South Africa and elsewhere, the French in northern Africa, the Italians in Tunisia and Libia, have settled in Africa within the last century, and most of them within the last two or three decades.

Descendants of the ancient Greeks and Romans and of the Phoenicians doubtless remain in many parts of northern Africa, but they have become so intermingled with other racial elements as to be indistinguishable.

In addition to Europeans, large numbers of Indians have settled in Africa, more especially in the eastern coast lands, where they are employed in agriculture or else are traders. In Kenya, Tanganyika, Natal, and the Transvaal they are numerous. Malays are settled in the Cape Province, particularly at Cape Town.

143, *Negro Races*. People of the negro races occupy more than two-thirds of the continent, roughly speaking all the area south of the Saharan and Nubian deserts and of a line stretching from Lake Victoria to the Indian Ocean. Their main characteristics are their black curly and frizzy hair, broad noses and open nostrils, thick lips, and dark (generally brown) eyes and skin. The races most distinctly negro are in the western and central Sudan, where their colour is more nearly black than is the case farther south. The Fula (see also § 140) inhabit the region of the Niger, and are the aristocratic and conquering people of western Africa who early in the nineteenth century displaced the

army of the Hausa rulers of Nigeria and established a great Fula empire. The Hausa who were thus conquered, except in Bornu, remained as agricultural serfs and dependants, having originally come into West Africa from Arabia, and by long intercourse with negro tribes become practically negroes themselves. Until the Fula invasion from the west they formed a powerful confederacy of States.

144. *Nilotic Races.* Eastward of the negroes proper are the Nilotic peoples of the southern part of the Anglo-Egyptian Sudan and Uganda. These peoples, unlike the negroes of western Africa who have many diverse languages, speak languages that are closely allied.

145. *Bantu Races.* South of a line running from Riodel-Rey in Cameroons to Lake Albert are the so-called Bantu peoples, who, like the Nilotic group, show evidences of a slight Caucasian strain and speak languages that are closely allied. With the exception of the Hereros of south-west Africa, they are mainly agriculturists. The finest types of this group are the Zulus of south-east Africa, with their offshoot the Matabele of southern Rhodesia. They are divided into numerous tribes, such as the Basuto, who inhabit the mountainous country to the east of the Cape Province; the Barotse of north-western Rhodesia; the Bambala of the Belgian Congo; the Mashona of southern Rhodesia; the Wanamwezi of Tanganyika territory; and the Bangala of the Cameroons region. In South Africa these tribes are loosely spoken of as Kafirs (i. e. foreigners or intruders), and their recent history has been a story of migrations along the East African plateau into the more southerly parts of the continent.

146. *Hottentots, Bushmen, and Pygmies.* In the midst of these tribes, but distinct from them, are the remains of what are supposed to have been the aboriginal races

of southern and central Africa—the Hottentots, Bushmen, and Pygmies, who are few, and are succumbing before the advent of the Bantu tribes and Europeans. The Hottentots at one period covered a great part of South Africa, and are a negroid-Hamitic race who have retired before the Kafir incursions into the south-western portions of South Africa, and are now only found in very small numbers in the western portions of the Cape Province and in the South-West Africa Protectorate. The Bushmen occur as nomad hunters in scattered groups in the South-West Africa Protectorate, having been driven there from the north of Africa. The Pygmies, who are first mentioned by Herodotus, are dwarfish tribes who have sought shelter in the forests of the Congo, probably having been driven there by Caucasian invaders from Egypt. They are wandering hunters without settled homes.

147. *Native Occupations.* Before the advent of Europeans and also very largely at the present time the occupations of African natives have been and are of a primitive nature. Roughly speaking these occupations are agricultural, or pastoral, and hunting. Among the great warrior tribes, such as the Zulus of Natal, the Matabeli, the Masai of Kenya Colony, and the Fula, the men have been trained to warfare and hunting, whilst agriculture has been carried on mainly by the women or by subordinate tribes who have been conquered in warfare. Thus the Matabeli have been largely a race of warriors. The Mashona whom they conquered have been agriculturists and pastoralists. The cessation of inter-tribal warfare over vast areas in Africa has modified the relative position of these tribes to a great extent, and has also resulted in a diminution of the prestige of the warrior tribes, but the old ideas of superiority are still prevalent among the former

warriors, and former customs prevail to a great extent. Domestic slavery, once extremely common, still exists among some of the Mohammedan tribes of the interior parts of western Africa, especially in those states where European influence is as yet hardly consolidated.

Hunting, as a rule, is the occupation of the aristocratic and warrior tribes, and before the introduction of firearms, was carried on by means of spears and bows and arrows, the digging of pits covered with bushes, or the building of stockades into which animals were driven. Certain tribes, especially those of the Nilotic group and the peoples of the river deltas, are expert fishermen.

Most tribal lands are held in common, and it is only where European influence has been fully established that the system of private ownership has been gradually introduced and recognized. No definite rule can be laid down, but generally speaking, the natives of South Africa have become individual owners and cultivators throughout large tracts of the country, while the same thing applies to large portions of West Africa. In northern Africa, where Mohammedan and Arabic influences are paramount, individual ownership is also the rule.

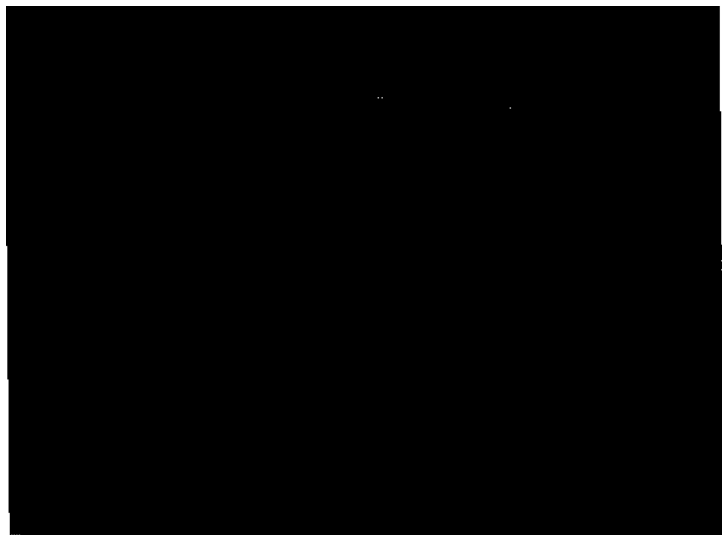
148. *Native Craftsmen.* In addition to agriculturists proper, each tribe has its carpenters, blacksmiths, weavers, potters, and workers in metal, whose activity corresponds with the degree of civilization attained by the tribal unit. In West Africa more especially, where, under the Hausa and Fula dominations, a considerable degree of culture has been attained, native craftsmen of all kinds have reached a high state of excellence. Native ironworkers of great skill have long been established in Nigeria, much work requiring high technical knowledge having been produced in the neighbourhood

of Benin. Wood-carving, ornamental pottery, engraved weapons and tusks of great excellence, are produced in abundance ; many tribes showing an artistic skill and knowledge of ornamentation of a high order, a native skill that is not confined to any particular district of Africa, but is more especially in evidence in western Africa. Basket-work and bead-work, giving great scope for the introduction of ornamentation and the use of colours, are common in all parts of Africa.

In the pictorial arts the African natives have not shown any great skill, but the crude cave paintings of the Bushmen are of high excellence because of the faithful representation of movement. Hunting scenes and animals represented in this manner are full of life and vigour.

149. *Capabilities of the Negro.* In his own environment and left to himself, the negro of western Africa has proved himself capable of a high state of civilization. In the great State of Bornu and in other parts of West Africa walled cities, in which the inhabitants had attained a degree of civilization comparable with that of early mediaeval Europe, are numerous. Such a city is Kano. Under European guidance the African native is not only capable of really great technical skill in the use of his hands, but also of attaining a considerable status in purely intellectual pursuits, and possibly, eventually competing with the European in his own peculiar sphere. This is especially the case in West Africa and in those countries where the native is not entirely subjected to labour, as is more particularly the case in South Africa with its comparatively large European population. In the West African colonies natives frequently reach good positions in the legal and medical professions and in the Civil Service, and are employed in positions of responsibility and trust.

150. *Native Houses.* In northern Africa, where arts and manufactures have long existed, based upon the civilizations of ancient Egypt, Greece, Carthage, Rome, and Arabia, Semitic influences have always preserved a high standard of civilization, and there has been evolved a characteristic style of architecture, reaching



XX. Mosaia village, Dembellia country, W. Africa (town drums in foreground)

its highest excellence in the cities of Morocco and in Cairo. Elsewhere architecture in Africa has been of a primitive type, except where foreign influences have intruded, and native houses and kraals are generally of mud and wattle, or dried mud alone, or merely built of thatch. These houses in South Africa and elsewhere are generally round; but they vary in shape in different parts of Africa, according to the custom of the tribe. Houses are grouped together into kraals surrounded byastockade.

151. *Growth of Population.* The increase of African peoples has been retarded in the past by two great evils—inter-tribal warfare and slavery. The first has probably prevailed from the earliest ages, and the second, although greatly extended during the seventeenth and eighteenth centuries, is almost, if not quite, as old. With the suppression of both of these evils, the African peoples are generally increasing rapidly. Nevertheless there are still certain factors that prevent the natural growth of the people.

152. *Sleeping-sickness and Malaria.* Throughout large districts in central Africa a disease known as sleeping-sickness has carried off a very large number of natives and depopulated whole regions, especially in Belgian Congo and Uganda, and Europeans have not been entirely free from its ravages ; while malaria, which is present throughout vast areas, particularly those that are low-lying or marshy, lowers the vitality of, and frequently destroys, Europeans and natives alike. The finest races of natives, such as the Zulus and the Masai, generally live in countries less malarious than many of the larger tracts.

In fighting these and other diseases, medical and hygienic science has made wonderful progress during recent years. A school for the study of tropical diseases has been established at Khartum, and wherever European influence has been extended in Africa, attempts have been made to introduce better systems of hygiene. It has been proved that malaria can be reduced, and entirely eliminated, if proper care is taken to prevent the spread of the anopheline mosquitoes which convey to man the minute animal parasites that cause malaria. Sleeping-sickness also is carried by a species of tsetse-fly, and many of the diseases of the Tropics are caused by parasites conveyed to mankind by insects. It is

a triumph of medical science that it has been able to point out both the cause and the remedy of many of these diseases.

X

MEANS OF COMMUNICATION

153. *Principal Methods of Travel.* Before the introduction of railways, communication and transport in Africa were slow and frequently dangerous. They were carried on mainly by means of porters, recruited and employed for this special purpose ; by trek-oxen harnessed to cumbersome wagons ; by methods peculiar to certain tropical districts, such as the hammock slung on two bamboos, carried on the shoulders of native bearers, and termed in the Portuguese colonies a *machila* ; by caravans of camels in the more arid portions of the continent ; and by native boats, canoes, and dug-outs on the available waterways.

154. *Caravans of Porters.* Although the building of railways has greatly reduced the use of native carriers, much of the transport from the interior districts to the coasts is still performed by porters who carry goods from centres of production to the nearest railway station or to the nearest port. This system has in the past been subject to grave abuses. Even now the fact that a colony is traversed incessantly by thousands of men with their loads, frequently carried on the head, means a direct economic loss to the native community owing to the withdrawal from the fields of labour that otherwise might be engaged in cultivation and production. Transport by porters is now practically confined to the tropical portions of the continent in such colonies as Cameroons, Belgian Congo, French Equatorial Africa,

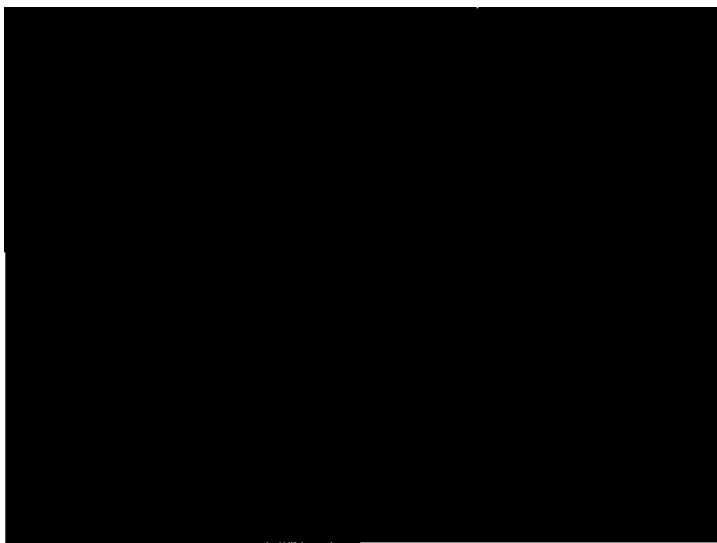
the West African colonies, and Eastern Africa generally ; but every railway that is established, so long as it traverses or reaches the centres of production, reduces this tax upon native man-power.

155. *Trek-Oxen.* Throughout South Africa and those portions of Angola and Mozambique where cattle are able to thrive, transport by means of wagons, generally with teams of oxen numbering from ten to twenty, is still usual in all districts without railway communication and for all short-distance transport. In the early days of exploration and expansion, practically the whole of the South African plateau was opened up by this means ; the Boers trekking over the veld towards the north and east in search of new homes beyond the then limits of European settlement. The teams vary in number according to the nature of the roads. Where the soil is sandy, or where, as in Mozambique, they follow the marshy banks of rivers, transport by this means is very difficult and slow. In all cases it is costly.

156. *The Machila.* Throughout large areas of tropical Africa, communication for Europeans is only possible by means of the *machila*, the bearers of which, following native paths through the forest or over the grasslands, can as a rule keep up a kind of trot for thirty to thirty-five miles a day, relays of natives taking turns in carrying. In northern Rhodesia, Nyasaland, the northern parts of Mozambique, and elsewhere, Europeans are carried in this way ; porters following with their loads of from 50 to 60 pounds each. In this manner many of the great explorers of Central Africa have travelled.

157. *Transport by Camels.* In the Sahara, Egypt, parts of Mozambique (Tete district), north-eastern Rhodesia, the Gordonia district of the Cape Province and the Kalahari Desert, South-West Africa, Northern

Nigeria, the Sudan, and elsewhere, camels are extensively used for transport. In the Sahara they are the only regular means of crossing the desert. At one period there was an extensive trade across the desert from north to south, and caravans of traders, banded together for mutual protection, proceeded over routes that had been so used for untold centuries. Recently, however,



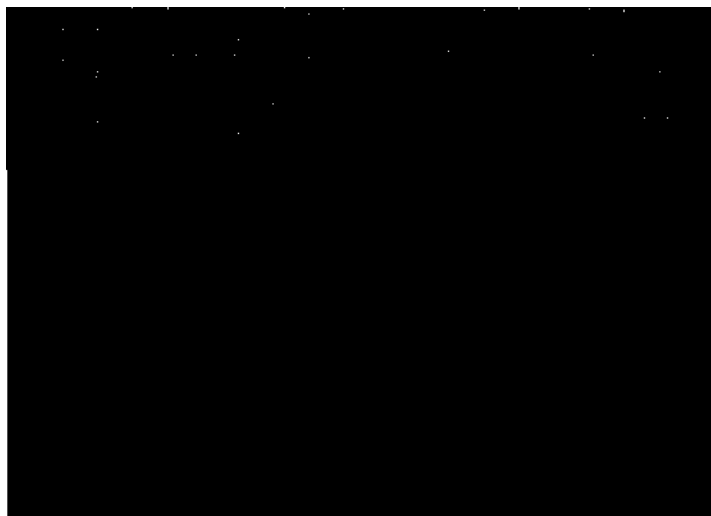
X X I . Porters crossing native bridge

owing to the increasing movement of trade towards the nearest coasts by means of railway transport, many of these routes have fallen into disuse, although an extensive trade still arrives at places like Kano, Zinder, Sokoto, and Timbuktu, from Morocco, Algeria, and Libia. These routes cross the Sahara in different directions, passing by way of the oases in the north to the somewhat arid grasslands of the northern portions of the central Sudan. The principal of these routes are those from the

city of Tripoli, through the oasis of Ghat in Fezzan and through the Air region to Sokoto, or via Murzuk and across the Tibesti plateau to Kanem and Kano ; from the Wad Draa and Tinduf in the south of Morocco, via Taodeni, once a great stone-built city, but now a place where settled life is no longer possible, to Timbuktu, being joined at Taodeni by a route starting from the oasis of Tuggurt in southern Algeria, and passing through the oases of Wargla, In-Salah, and Tuat, where it is joined by another route up the Wad Saura from Colomb Bechar and Beni Abbes ; and from Tripoli via Nalut and Sinaun to Ghadames and thence to Akabli (Tidikelt), where large caravans used to assemble to go to Timbuktu. The principal exchange of commodities over these caravan routes is in dates and salt. The latter is largely got from Taodeni, Bilma, directly north of Lake Chad ; Dimi, north of Abeshir, and the Natron lakes south of Alexandria. West of Taodeni lies the terrible salt desert of El Juf, across which there are no caravan routes. Abeshir, the capital of Wadai, in the central Sudan, is another great centre of trade, but the route to this place is from Khartum, via El Obeid in Kordofan and El Fasher in Darfur, or via the oases west of the Nile. The route across the Sahara from Bengazi in Cyrenaica via the oasis of Kufra is now seldom used.

158. *Water Communications.* With the exception of the portions of Africa south of the Zambezi and north of the Sudan (omitting the valley of the Nile), transport by water is possible over extensive areas of the continent. The means of conveyance range from small native boats to large shallow-draught launches, and in the coastal rivers from dhows and small steamships to large ocean-going ships (in certain favoured estuaries). With the continuous opening of Africa by means of railways, one of the greatest problems of the present time is to render

possible the fullest use of existing means of water communication by joining rail and water routes and by removing or circumventing the formidable obstacles to navigation that are to be found in most African rivers. The four principal navigable rivers are the Nile, Congo, Niger, and Zambezi, while the great lakes of the interior are a great system of internal navigation.



XXII. Navigation in Sudd region of the Nile obstructed by blocks of vegetation (Sudd)

159. *Navigation on the Nile*, On the Nile and its tributaries there are fully 3,000 miles of navigable waterways, but these are broken into sections by cataracts at Assuan ; above Wady Haifa ; at Kerma, below Dongola; at Kareima; below Berber; and below Khartum; and by the rapids between Rejaf (opposite Gondokoro) and Nimule (opposite Dufile) ; above Foweira ; and between Namasagali and Jinja. An unbroken journey by water down the Nile from the

Victoria Nyanza is, therefore, at present impossible, and the traveller is obliged to take the railway from Jinja to Namasagali, steamer across Lake Kioga from Namasagali to Masindi Port, motor and land transport from Masindi Port to Butiaba, a port on the eastern coast of Lake Albert, steamer from Butiaba to Nimulc, land portage to Rejaf, and steamer from Rejaf to Khartum, 1,089 miles north of Rejaf. During a considerable part of the year navigation is maintained with difficulty owing to the presence of dense vegetation and the general shallowness of the Nile.

Khartum is a great centre for steamer traffic on the Nile. Services are maintained to Meshra el-Rek on the Bahr el-Ghazal and as far as Wau on the Jur river when there is sufficient water ; Rejaf; and Gambela (when possible) on the Sobat tributary. There are also services between Wad Medani on the Blue Nile and Roseires, an important place on the Abyssinian frontier ; and north of Khartum between Kareima and Kerma and between Wady Haifa and Shellal. Below Assuan unhampered communication is possible with Cairo and the sea—the Damietta mouth of the Nile being 760 miles from Shellal, 1,917 from Khartum, and 2,115 from Nimule. Railway communication exists from Sennar to Wady Haifa and from Shellal to Cairo and Alexandria, so that it is possible to travel by rail all the way to Sennar with the exception of the section between Shellal and Wady Haifa.

160. *Navigation on the Congo.* The Congo also forms a great navigable route into the interior of Africa (see § 91), and it is possible to travel by alternate water and railway communications from the mouth of the Congo to Cape Town or across Africa to Dar-es-Salaam. The passenger services on the Congo, though regular, are slow, and on the upper reaches of the Congo uncertain during the dry

season. In addition to being the main entrance to Belgian Congo, the Congo is also the principal gate into French Equatorial Africa, the route to which is from Brazzaville on Stanley Pool, up the Congo and Ubangui, then up the Tomi river to Fort de Possel, whence portage has to be employed across the divide via Fort Sibut to Fort Crampel on the Gribungui river. The route is then down the Gribungui and Shari rivers to Lake Chad. This is a circuitous and slow route. An alternate route to Lake Chad is up the Niger and Benue rivers to Lere in the northern Cameroons and then by a combined land and water route to the Logone and down that river to Fort Lamy. With the occupation of much of Cameroons by the French as mandatory of the League of Nations, a direct railway or road will certainly be constructed to the excellent port of Duala.

161. *Navigation on the Lakes.* On all the great lakes steamboat services have been established. On some of them, such as Lakes Victoria, Tanganyika, and Nyasa, the steamers are of considerable size, some of them being 1,200 tons, four times as large as the vessels in which Columbus crossed the Atlantic. The establishment of steamer services on these lakes is having an important social and economic effect by bringing into constant intercourse different races on opposite shores of the lakes. Lake Victoria is traversed in all directions, and the port of Kisumu, at the end of the Uganda railway to Mombasa, is the collecting centre for produce brought by the Busoga railway to Jinja from the ports on Lake Kioga, for produce from western Uganda brought to Port Bell, near Entebbe, and for the produce of Ruanda shipped at Bukoba, and of the north-western part of Tanganyika Territory shipped at Mwanza.

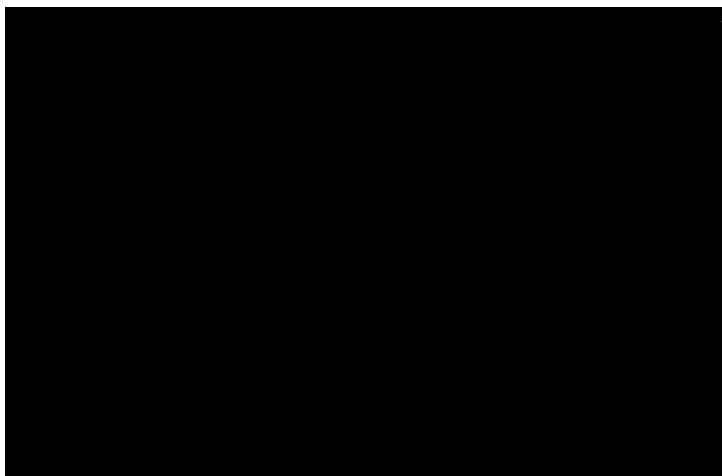
Lake Tanganyika also is situated at a most important economic centre. By building their railway from Dar-

es-Salaam to Kigoma, a little north of Ujiji, the Germans sought to draw commerce and produce away from the long route down the Congo, and from the route through Rhodesia. So far as Katanga is concerned it is as yet uncertain which will be the cheapest route to the coast, but there can be no doubt that the produce of the western shores of the lake will be collected at Kigoma. The connecting route between Lakes Tanganyika and Nyasa by means of the Stevenson road (220 miles) over the Tanganyika-Nyasa plateau, if railway communication were established, might draw the produce of the south of Lake Tanganyika towards Beira.

162. *Roads.* In recently developed countries in Africa, trunk lines of communication have generally been opened up by railways, whereas in older communities great railways have usually been preceded by roads. In Africa generally, apart from native tracks used by carriers, roads scarcely existed before the advent of railways. Amongst the longer settled European communities in South Africa, main roads had been built between the larger centres of population, but even at the present time the average country road in South Africa is often a mere track over which mechanical transport is impossible. Where they are direct feeders to the railways the roads are of great economic value, but where they do not exist, or are poorly constructed, the cost of transport from a farm to the railway is often prohibitive, and farming activities are then practically confined to ranching.

In many parts of Africa good roads, over which motor traffic is possible, are being constructed in connexion with the railways : but the length so constructed is at present comparatively small. Typical examples of such recently constructed roads are to be found in Ashanti and Uganda, where motor-transport brings

produce to the distributing centres ; in Nigeria, where Sokoto is being connected with Zaria; in Katanga, where the outlying mines are connected with the railway by good motor roads ; and in Morocco, where fine military roads have been built in many directions. An example of an important and long road-route is that from Stanleyville to Lake Albert, which supplies the necessary link



XXIII. French road construction, Algerian plateau

between the Congo rail and river route and the Nile. A railway will be constructed over this route.

163. *Railway Communication.* Where the exportable wealth of Africa is of forest origin, e.g. rubber and palm-oil and palm kernels, waterways have been of prime importance : elsewhere the physical obstacles on the rivers have encouraged land routes. It has thus happened that owing to the presence of the tsetse-fly throughout vast districts, fatal to cattle and horses,

railways have been the only satisfactory means of developing vast territories that otherwise would have remained in their primeval seclusion. The central African lakes, separated from the coasts by great distances, can only be developed commercially by railway transport.

Railways were first established in those portions of Africa where European influence had long been predominant, such as Cape Colony, Algeria, and Egypt, and they were extremely useful, especially in Algeria and South Africa generally, in developing those countries ; but it was not until a new era of railway construction was commenced in 1884, when the Lower Congo Railway, connecting the navigable reaches of the middle Congo with the river-port of Matadi, was built, that the active development of tropical Africa began. Railways have now been constructed in almost every African country, but-as yet the great through routes of the future are only in their initial stages.

164. *Principal lines.* At the present time at least 22 main lines of railway communication have been established. They are as follows : (1) Cape Town to Bukama in the Belgian Congo, 2,598 miles, via Kimberley and Buluwayo; (2) Buluwayo to Beira, 676 miles; (3) Kimberley to Lourenco Marques, via Johannesburg, 703 miles ; (4) Johannesburg to Durban, 482 miles ; (5) Johannesburg to Port Elizabeth and East London, 712 and 665 miles respectively ; (6) Dar-es-Salaam to Kigoma on Lake Tanganyika, 780 miles ; (7) Mombasa to Kisumu on Lake Victoria, 584 miles ; (8) Jibuti to Addis Abeba, in Abyssinia, 490 miles ; (9) Port Sudan to Atbara Junction, 299 miles ; (10) Wadi Haifa to El Obeid, via Khartum and Sennar,,1,005 miles ; (11) Alexandria to Shellal, via Cairo, 555 miles ; (12) Tunis to the Moroccan frontier, 940 miles ; (13) Phillippeville

to Tuggurt, via Constantine, El Guerra, and Biskra, 392 miles ; (14) Oran to Colomb-Bechar, 465 miles ; (15) Ujda (Moroccan frontier) to Taza, 145 miles ; (16) Fez, via Rabat-Sallee to Kaid Tounsi, 303 miles ; (17) Dakar to Kayes, on the Senegal, 467 miles ; (18) Dakar to Saint Louis, 163 miles ; (19) Kayes to Bamako and Kulikoro on the Niger, 343 miles ; (20) Konakry to Kurussa, and thence to Kankan on the Milo branch of the Niger, 411 miles ; (21) Lagos to Kano, 704 miles ; and (22) Port Harcourt to Udi, 151 miles.

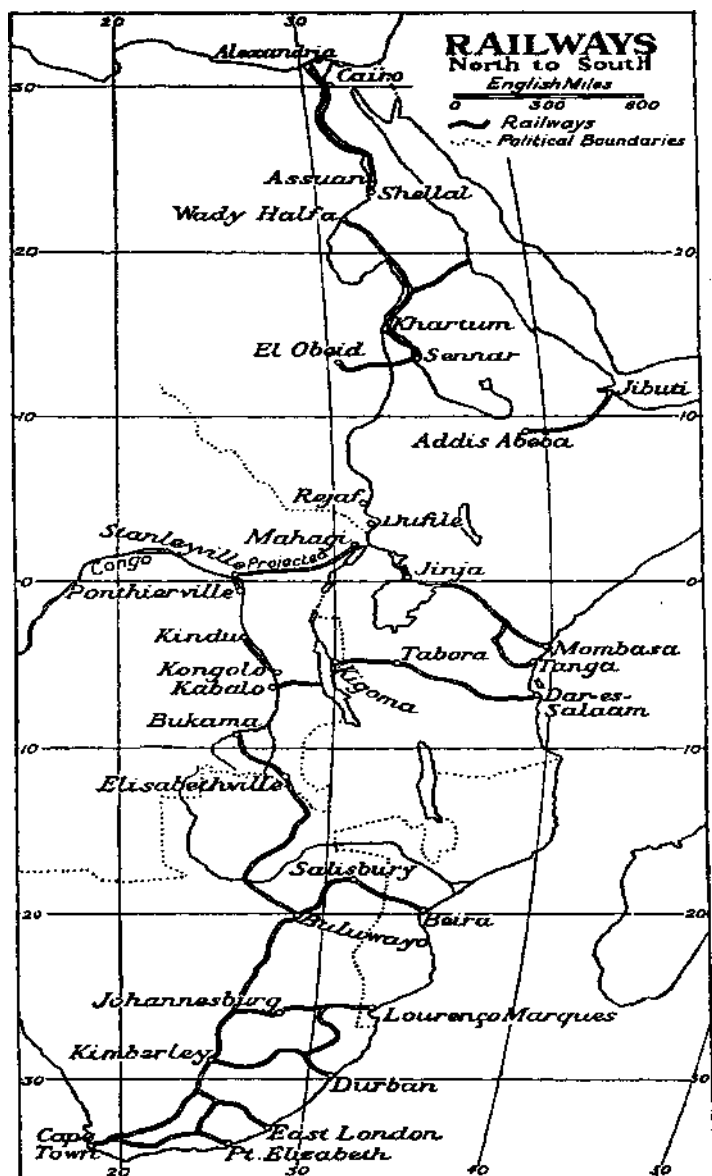
165. *Subsidiary railways.* The above mentioned railways, although some are of narrow gauge, may be regarded as main routes ; but there are in addition numerous other lines in Sierra Leone, Ivory Coast, Gold Coast, Togoland, Dahomey, Cameroons, Belgian Congo, Angola, South-West Africa Protectorate, Mozambique, Nyasaland, Tanganyika Territory, and Kenya Colony. The important railway from Lobito Bay to Katanga, now under construction, will facilitate a direct journey across Africa from west to east.

166. *The South-to-North routes.* The best route for a railway from south to north is obviously over the savanna, and for this reason the railway from Cape Town, after laboriously climbing the coastal terraces, finally emerges on the high plateau and makes for Kimberley, where the diamond mines provided the motive for its construction. Extending northwards over the plains of Bechuanaland it eventually reached Buluwayo, where, again, the discovery of mineral wealth was a predominating factor in its construction. The subsequent discovery of copper in Katanga and the presence of lead, zinc ores, and coal in the Wankie and Broken Hill areas, in Rhodesia, provided the incentive for its continuation to the navigable waters of the Lualaba-Congo. Similarly the gold area around Salisbury led to an extension in

that direction, and the obvious need for an outlet to the coast resulted in the construction of the line from Beira to Salisbury. The railway from Nyasaland to the Zambezi and thence to Beira forms the outlet for that part of south central Africa. The great curve taken by the Rhodesian railway to the Wankie coal-fields and the Victoria Falls has necessitated a much longer haulage from Katanga to Beira than would otherwise have been the case, and a railway will be constructed from Salisbury to the point where the main line crosses the Kafue in order to effect a saving of some 587 miles in transit.

The discovery of gold on the Rand resulted in great railway activity in South Africa, and railways were constructed from the ports of Port Elizabeth, East London, Durban, and Lourenco Marques towards that district, meeting at Johannesburg, the most important railway centre in the sub-continent. Discoveries of copper in the extreme north of the Transvaal, at Messina, led to the continuation of railway communication to that point. In the South-West Africa Protectorate the Germans had constructed a central trunk-line, with branches to the ports of Swakopmund and Luderitz Bay (Angra Pequena), and northwards to the Otavi and Tsumeb mines. The trunk-line has been continued by the British across the Orange River and now joins the main Cape route at De Aar.

167. *Lateral Railways.* It will be seen by a glance at the map that the importance of what may be termed the great trunk route from north to south of Africa consists not so much in the fact that it will connect Europe with South Africa, although this is of great importance, but that it will serve as a link between the interior districts and the coasts by means of other lines built east and west. Similarly the French trans-Sahara



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railway, if constructed, will be of importance as the connecting link between the French north African territories and the French west African colonies, and therefore of great strategic and political value. The proposed extensions via Lake Chad to the Congo regions in one direction, and via Timbuktu or its neighbourhood to Dakar in the other direction, would establish important through routes, not so much for commerce as for quick passenger transit. Commerce will almost undoubtedly find its way to the nearest ports. In connexion with passenger and mail traffic, the proximity of Dakar to South America should be noted.

168, *The Cape-Cairo Route*. Economic progress in Africa has been from the coasts inland, and already the central avenue of communication, known popularly as the Cape-Cairo route, is being joined to the existing ports. From the west a line at Lobito Bay is advancing over the Bihe plateau towards the high country of Katanga ; from the east the Tanganyika and Uganda railways have already reached portions of the central avenue. In the case of the former the connecting link has been supplied by the line from Albertville on Lake Tanganyika to Kabalo on the Congo, establishing communication between Dar-es-Salaam and that river. Farther north, in the Anglo-Egyptian Sudan, the line from Port Sudan to Atbara provided an opening for communication from Khartum and beyond, and superseded the old caravan route to Suakin. The south-to-north route as it at present exists, by means of the rail route from Cape Town to Katanga, and the rail-and-water route down the Congo to Stanleyville, whence the only necessary link to the Nile is a railway to Lake Albert, lies well to the west of the continental water-parting ; but if, as seems probable, the eastern route

should be through Tabora and thence to Lake Victoria, it would then closely follow the divide.

169. *French Railways in West Africa.* In western Africa the French have been particularly successful in connecting navigable waterways with the nearest land-routes to the coast. The first railway to be constructed was that from Kayes, an important market at the head of the navigable section of the Senegal river, to Bamako and Kulikoro on the Niger, situated between two navigable reaches of that river. This gave access up the Senegal and thence by a combined rail and water route to Timbuktu. Subsequently, owing to the difficulty of navigating the mouth of the Senegal, a railway was constructed from Saint Louis near its mouth to Dakar, where the French had established a fine port. From Thies, on the Dakar-Saint Louis line, a railway has been constructed through Tambacunda to Ambidedi and Kayes, giving direct access to the Senegal and Niger rivers ; although the nearest and natural outlet for the Upper Niger is through the British colony of Sierra Leone. For political reasons the latter route has not been adopted.

A further railway has been built from the port of Konakry, in French Guinea, across Futa Jallon, to Kurussa on the Niger, and thence to the important commercial centre of Kankan on the Milo branch of the Niger. These lines are only part of a scheme for which surveys have been made for a trunk route through the country in the great bend of the Niger, with branches connecting with railways already constructed northwards from the coasts of the Ivory Coast colony and Dahomey, and forming southern outlets for* the proposed trans-Sahara railway from a point on the Algerian coast.

170. *The Nigerian Lines.* In British territory the

railway from Lagos to Kano, crossing the Niger at Jebba, traversing the most densely populated districts of southern Nigeria and passing through the large cities of Abeokuta, Ibadan, Oshogbo, and Ilorin, crosses the rolling plateau of northern Nigeria and terminates at the great mart of Kano, which is the focus of trade and produce for this part of Africa. A branch line from Baro, on the Niger, to Minna on the main line, brings the navigable section of the lower Niger into direct relations with the railway. A further trunk line will be the railway from Port Harcourt to the Udi coalfields, which will be continued across the Benue river to the neighbourhood of Kaduna on the main Lagos-Kano railway.

171. *Railways and Development.* It has been said above (§ 168) that recent economic progress in Africa has been from the coasts inland. For Europeans during many ages the rim of Africa alone existed, and the rim looked outwards and not inwards. Such commerce as existed was from the coasts to distant countries. The northern coasts of Africa faced Europe and were part of the Mediterranean rather than Africa; the eastern coasts faced Asia—particularly Arabia and India—and commerce was in those directions; the western coasts faced America and the West Indies, with which the slave-trade was long carried on; the southern coasts were merely a half-way house on the way to the East. It was not until the great explorers, and particularly Livingstone, had journeyed into the interior, that development proceeded towards the centre of Africa, and in this connexion railways have been the most useful and important avenues of communication.

172. *Air-Routes.* Although comparatively little has yet been done to establish air-routes across Africa, certain main lines of communication have already been

traversed, and it is certain that in the near future aerial highways will play an important part in the development of the continent. From the geographical point of view, the development of these routes is of the highest significance. It has already been possible to indicate by observation from the air the former course of the Nile, particularly between Abu Hamed and Wady Haifa, where the Nile now makes a great bend to the west, but formerly, by the evidence of the huge cliff lines, took a much more direct route across the Nubian Desert. Elsewhere in Africa similar topographical evidences will be revealed by the use of the aeroplane. Economically, of course, for purposes of quick transit, the use of the aeroplane will have an important effect on African development.

At present only three important routes have been experimentally traversed. The first is that from Cairo to Cape Town, 5,206 miles, first traversed in 1920. The airmen, crossing the Mediterranean from Taranto in southern Italy to Solium, flew to Cairo, and thence proceeded by way of the 42 prepared aerodromes and landing-places, with an average distance of about 124 miles between each. From Cairo the course of the Nile was followed to Wady Haifa, and thence across the desert to Shcriek, from which place the Nile was again followed in the main as far as Jinja. Beyond Jinja the eastern shore of Lake Victoria was skirted to Kisumu (an important point connecting with the Uganda Railway to Mombasa) and Mwanza at the south end of the lake. From Mwanza to Abercorn on the Nyasa-Tanganyika plateau the route was via Tabora, on the Tanganyika railway, over difficult country. Beyond Abercorn the route turns south-west to Broken Hill, and thence is via Livingstone, Buluwayo, Palapye, Johannesburg, Bloemfontein, Victoria West, and Beaufort

West to Cape Town. This route, although at present only in the experimental stage, seems to be the one most likely to be followed in future aerial transit to South Africa. Not only does it in the main follow closely the existing railway and water routes, but by crossing such places as Kisumu, Tabora, Broken Hill, and Buluwayo, it suggests the possibility of lateral routes across Africa from west to east. In connexion with the Mediterranean crossing, the value of Malta should be noted, and also the importance of Solium, an insignificant port on the edge of the Libyan desert, and Heliopolis, near Cairo, as air-stations.

The second route that has been traversed is that from Algiers, via the oases of Tuggurt, Wargla, El-Golea, In-Salah, Tamanrasset, and Tin-Zaouaten, to Timbuktu, and thence via Bamako to Dakar. The importance of this route and of other routes across the Sahara in the development of quick intercourse between France and her west African colonies is evident, and it is not impossible that the development of aerial transit across the Sahara will render unnecessary the building of a trans-Sahara railway.

The third route is one from Kenitra in Morocco to Agadir, the Canaries, Port Etienne, and Dakar. There are, however, endless varieties of possible air-routes over Africa, but in the present stage of aerial development it is not possible to indicate what will be the great aerial highways of the future.

XI

SEAPORTS AND INLAND TOWNS

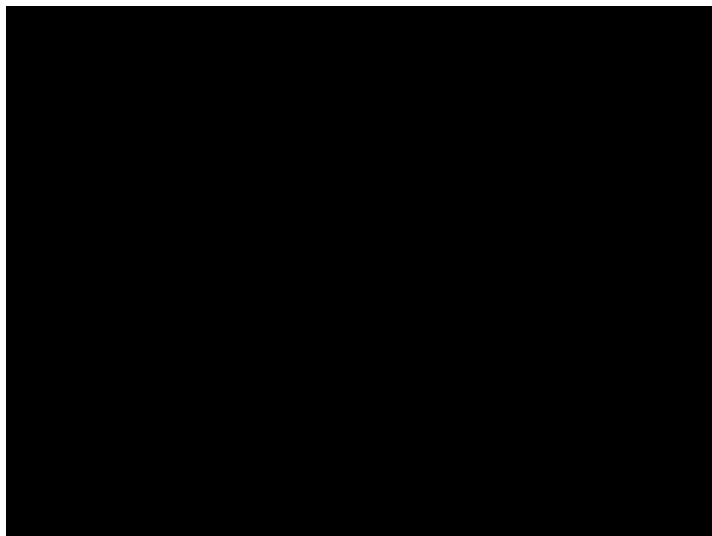
173. *Importance of Seaports.* As has been shown (see §§ 7 and 54), the coasts of Africa are not naturally adapted for maritime trade. But as the present economic expansion of Africa is entirely due to the use of sea-routes, and as development has had to proceed from the coasts towards the interior districts, the establishment of suitable harbours has been a necessity in the opening of the country to modern commerce.

174. *Egyptian Ports.* Ancient Egypt, where civilization was first developed on the continent, was in the main self-centred and self-contained. Nevertheless, there was considerable intercourse with Palestine and Syria, with Arabia, and with the Mediterranean. With the first two countries intercourse was maintained largely by the land route via El-Arish and Gaza or Beersheba, the route approximately followed by the present railway into Palestine. With Arabia communication was by means of the route from Keneh on the Nile to Kosseir on the Red Sea and thence by sea. At a later period, with the extension of Greek influence, the port of Alexandria, still the chief port of entry into Egypt, rose to importance. Alexandria has always been rather a foreign than an Egyptian city, and nearly one-quarter of its inhabitants are of foreign extraction. The establishment of Port Said, at the northern entrance to the Suez Canal, created another valuable port—important rather as a meeting-point of commerce than as a port of entry into Egypt. Ismailia on the Suez Canal, and Suez, at its southern entrance, are of far less value, while El-Arish, Damietta, Mersa

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Matruh, and Solium, on the Mediterranean coast, the two last giving access to the oases of Siwa and Jarabub across the Libyan Desert, are of minor importance.

175. *Ports of Libia, Tunisia, and Algeria.* Farther west the small port of Tobruk, in Libia, situated on a bay of the same name, has a fine harbour, but is of little commercial importance though of naval value in



XXIV. Suez Canal

the hands of a strong maritime power. Tripoli, the capital of Libia, has always been important as the outlet of a fertile district backed by an arid hinterland, and as the terminus of numerous caravan-routes across the Sahara. The Italians have greatly extended the capacity of this port, which, with Derna and Bengazi in the Cyrenaica province, form the chief ports of Libia.

Tunisia possesses a number of valuable ports. In the

south Gabes, Sfax, and Susa are outlets for the enormous deposits of phosphates in the southern interior, particularly the two former. Bizerta, at the extreme north, is an important naval station, and being the most northerly town in Africa, is within easy reach of the European coasts. Tunis, the capital, is a large and important city, connected with the sea by means of a canal communicating with the port of Gulette (Goletta). Tunis lies a few miles south of the site of Carthage.

In Algeria, in addition to Algiers the capital, there are several important harbours, the principal of which are Bone, Philippeville, Bougie, Dellys, Mostaganem, Arzew, and Oran. Philippeville is the main outlet for the province of Constantine and for the traffic over the railway to Biskra and Tuggurt. Oran, Mostaganem, and Arzew are the main outlets for the alfa grown on the high plateau, the first in addition being the principal port of western Algeria and the outlet for the traffic of the railway to Figig and Colomb Bechar, as well as being an important commercial centre.

176. *The Moroccan Ports.* The ports of Morocco, with the exception of Tangier, Rabat-Sallee, and Casablanca, are of minor importance. Melilla and Ceuta are the principal Mediterranean ports of the Spanish zone. Melilla is the outlet for extensive lead and iron mines in the neighbourhood, and Ceuta is of considerable strategic value, and is almost opposite Gibraltar. It is one of the outlets for the city of Tetuan, the other being Rio Martin, a small port six miles below the city.

On the Atlantic coast the port of Laraiche (El-Arish) is the outlet for the city of Alcazar. Tangier, north of Laraiche, although it is an exposed open roadstead, is nevertheless of great importance from both the commercial and strategic aspects, but at present more especially from the latter, as it lies on the Atlantic

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coast near the entrance to the Straits of Gibraltar. Fortified and held by a strong power it would be a menace to shipping. It is being connected with Fez by a broad-gauge railway which is intended to be part of a through route to Algeria and Tunisia, and, possibly, to Dakar on the West African coast. The situation of Tangier at what may be termed the front door into Africa has caused maritime nations to regard it as of great importance : hence it has been placed under international control. South of Tangier and Larache are the ports of Rabat-Sallee, Casablanca, Mazagan, Saffi, Mogador, and Agadir. Rabat-Sallee lies on both sides of the Wad Bu Regreg, and it forms the outlet for the city of Fez, the northern capital of Morocco, an important commercial and trading centre, and for Meknes (Mequinez), the summer capital of Morocco, with both of which cities it is connected by rail. North of Rabat-Sallee, about 22 miles up the Sebu river, is the port of Kenitra, to which small vessels can ascend. At Casablanca, which is the outlet for Settat and Mechra ben-Abbu, extensive harbour works have been constructed and a large European population has settled. At Saffi is the deepest and best anchorage on the coast, but the port is not much used. Mogador is the outlet for Morocco city, the southern capital, distant three or four days' journey, and the centre of a great local trade in dates, leather goods, and articles of native manufacture.

All the ports on the Atlantic coast of Morocco are indifferent, and open to the boisterous seas of the Atlantic. South of Morocco the small harbours of Ifni and Rio de Oro (Villa Cisneros) are in Spanish territory. The latter occupies a most important strategic position, and is capable of considerable development, but is of no commercial value, as the hinterland is very arid.

177, *The Upper Guinea Ports*. On the west coasts of Africa there are numerous important seaports, but only a few have good natural harbours. Saint Louis, at the mouth of the Senegal river, lies on a small low island, but the river is impeded by a bar, and is extremely shallow at certain seasons. Dakar, farther south, has a fine harbour, and has been greatly improved by the French. As the terminus of railway communication from the interior and the nearest point to the South American coasts, it seems destined in the future to be the focus of international routes crossing the Sahara to Algeria and Morocco. Bathurst, at the mouth of the Gambia river, has a most important strategic situation, and as the outlet of this great waterway is capable of great development. Konakry, the principal port of French Guinea, is important as the terminus of the railway from the Niger, and has been developed by the French. Freetown, situated on a magnificent natural harbour, is the principal outlet for Sierra Leone, and an important strategic point. Monrovia, the capital of Liberia, is an indifferent port, but of value as the principal outlet of a very rich hinterland.

For the Ivory Coast Colony the port of Grand Bassam, connected by an extensive series of lagoons with numerous small ports, is the main outlet, and in the Gold Coast Colony the ports of Seccondee and Accra are of considerable commercial importance, but have artificial harbours. Seccondee is the outlet for the gold-mining districts of the western interior ; Accra for the palm-kernel and cocoa areas of the east. Plans have been approved for the construction of a new harbour at Takonadi near Seccondee. Other indifferent ports on this coast are Winnebah, Addah, Saltpond, Cape Coast, Axim, Half Assinie, and Appam, while Lome, another indifferent port, is the outlet for the Togoland railway.

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All along these coasts are the remains of the forts and establishments of the sixteenth and seventeenth centuries, testifying to the commercial importance of this region. The two most important ports of Nigeria are Lagos, situated on an island and the terminus of the railway to Kano, and Port Harcourt, on the estuary of the Bonny river and the outlet for the Udi coalfields ; but there are many trading centres serving as ports, such as Forcados, New Calabar, and Old Calabar, in the delta of the Niger. Opobo, in the same district, is the largest oil-exporting port in West Africa.

178. *The Lower Guinea Ports.* In Lower Guinea, Rio del Rey and Victoria, the latter on Ambas Bay, are important commercial outlets, while Duala, situated on a fine waterway (the Cameroons estuary) is the main outlet for the trade of the central Cameroons, and eventually, when railway communication has been established, for much of French Equatorial Africa.

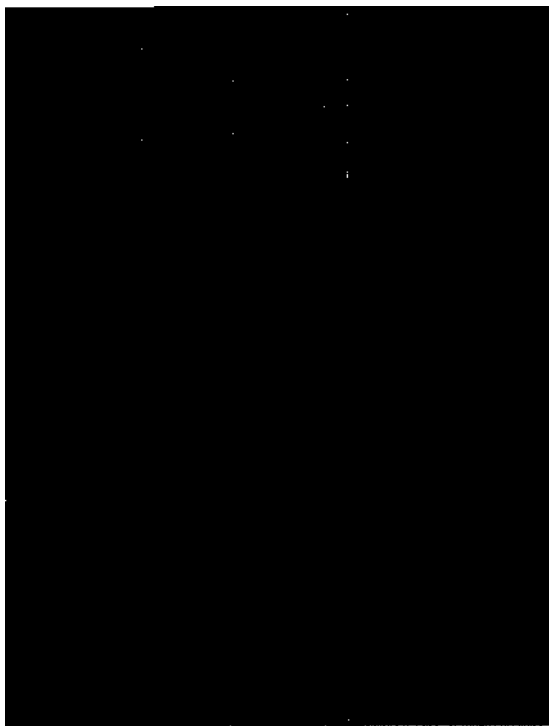
Kribi, farther south, is an indifferent open port, but is the outlet for a hinterland rich in palm-oil and other tropical products. In the Gabun Colony the ports of Libreville, situated at the entrance to a large estuary, and Cap Lopez, another deep-water port with a large anchorage, have as yet scarcely been developed. Loango is the principal port of the southern portions of the colony, while the neighbouring harbour of Pointe Noire, from which it is proposed to build a railway to Brazzaville on Stanley Pool, will eventually become an important place as an outlet for some of the traffic of the Congo and Ubangui rivers. Farther down the coast Banana, Boma, and Matadi, ports on the estuary of the Congo, are of considerable commercial importance, the last being the terminus of the Lower Congo Railway. In Angola, Sao Paulo de Loanda, Benguella, and Mossamedes are the principal ports, but a few miles

north of Benguella is the magnificent deep-water harbour of Lobito Bay, which, when railway communications are completed, will be one of the main exits for traffic from Katanga. It is already assuming great importance as the outlet for traffic from the Bihe plateau of Angola, and eventually will rival Beira, on the opposite coast, as a commercial outlet.

179. *South African Ports.* On the south-west coasts of Africa the only ports that have been developed are Swakopmund, Walfish Bay, Angra Pequena (Luderitz Bay), Port Nolloth, and Cape Town. The first is merely an open roadstead which was extensively used by the Germans, owing to the fact that the neighbouring Walfish Bay was a British possession. With the British occupation of the whole of this territory, Walfish Bay, which has a good harbour, has become the principal port of entry for the South-West Africa Protectorate and has been connected with the main railway system. Angra Pequena, farther south, is the terminus of the line to Keetmanshoop, 228 miles, but although the anchorage is fairly good, the surrounding country is a waterless desert. Port Nolloth, in the north-west of the Cape Province, is merely the port of exit for the copper mines in the vicinity; but Cape Town, at the south-west corner of the Province, not only occupies a most important strategic position, but is also the largest port in South Africa, and with its suburbs, the second largest city in the Union. Situated on the main sea-route to Australia and the East, it was at one time the port of call for all vessels proceeding to those regions, and since the construction of the Suez Canal it is still used by ships proceeding by the Cape route as well as by those specially bound for South Africa. It is 5,978 miles by sea from Southampton and 428 miles by sea from Port Elizabeth, the next important port. There are

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extensive docks, and a naval port has been established at Simon's Town on the other side of the Cape Peninsula, which has a better natural harbour than Cape Town.



XXV. Durban

Port Elizabeth, an open roadstead situated in Algoa Bay, is the outlet for much of the produce from the central and eastern portions of the Cape Province and the Orange Free State, and carries on an extensive export of ostrich feathers and wool. East London, 131 miles farther east, situated on the Buffalo river, is the outlet for the portion of the Cape Province formerly

known as Kaffraria and also for much of the up-country produce. Durban, the principal port of Natal, has a fine land-locked harbour known as Port Natal, and is well situated for dealing with the traffic of the Witwatersrand and the coal area of northern Natal.

180. *The Mozambique Ports.* Farther north, in Mozambique, Lourenco Marques, situated on Delagoa Bay, is in reality a port of South Africa. Its maritime hinterland is comparatively unimportant, and it depends mainly upon the Transvaal for its prosperity. By special agreements between the Union Government and the Portuguese Government of Mozambique, the Transvaal traffic is divided, in certain specified proportions, between these five ports.

Along the coast of Mozambique are a number of small ports, such as Chai Chai, on the Limpopo river ; Inhambane, one of the outlets for Gazaland ; Chiluané and Sofala, which have lost their former importance ; Chinde, a port of entry for British Nyasaland, situated on the Chinde mouth of the Zambezi ; Quelimane, the outlet for a rich planting district north of the Zambezi ; Mozambique, situated on an island, and formerly a most important Portuguese settlement, and still carrying on a considerable trade by means of Arab and Indian dhows ; Porto Amelia, situated on one of the most spacious harbours on the East African coast (Pemba Bay), and the principal port for Portuguese Nyasaland ; Ibo, situated on an island ; and Tungwe, a small coasting port at the extreme north of the colony. Beira, situated at the mouth of the Pungwe river, on an exposed spit of sand, is the present outlet for the trade of Rhodesia and for much of the traffic from Katanga. As it has been connected by railway with British Nyasaland it is also the principal port for that territory, and there is, moreover, a considerable and fertile

hinterland within Portuguese territory. Owing, therefore, to its important economic situation, extensive harbour works have been undertaken.

181. *The East African Ports.* In Tanganyika Territory the principal ports are Lindi, Kilwa Kivinje, Dar-es-Salaam, and Tanga, all possessing good natural harbours. The two former are without railway communication, but Dar-es-Salaam, as the terminus of the railway to Lake Tanganyika, and Tanga, as the terminus of the line to the Kilimanjaro district, have been considerably developed and have an increasingly important trade. Zanzibar, on the large island of the same name, occupies an important and peculiar position as a great distributing centre both with the mainland and with Arabia and India. In spite of attempts to divert this traffic to ports on the mainland, it remains the principal centre of exchange on this part of the East African coast.

In Kenya Colony, Mombasa possesses two harbours, the larger one known as Kilindini, lying on the west side of the small island on which the city is built. As the terminus of the Uganda railway, the trade is continuous and increasing. Farther north, Malindi and Lamu are small ports, while Kismayu,¹ situated a few miles south of the Juba river, is the only fairly good port between this point and the Red Sea, the others in Italian Somaliland, such as Brava, Mogadiscu, and Warsheik being indifferent anchorages, as is Berbera on the Gulf of Aden and the principal port of British Somaliland. At the entrance to the Straits of Bab-el Mandeb lies the important harbour of Jibuti, which is a French port at the termination of the railway from Addis Abeba in Abyssinia, and occupies a most important

¹ It is proposed to cede Kismayu and country on the right bank of the Juba river to Italy.

strategic and commercial position. Farther north, Massawa is the principal port of the Italian colony of Eritrea, while the small port of Trinkitat forms the outlet for the Tokar cotton district of the Anglo-Egyptian Sudan. Suakin and Port Sudan are connected by rail with the Anglo-Sudanese system, and are the exits for much of the trade of the Khartum and other districts of the Sudan, more especially Port Sudan, which has been greatly developed by the Anglo-Egyptian authorities.

182. *Inland Cities: Egypt and the Anglo-Egyptian Sudan.* The greater part of the urban population of Egypt is situated in the region north of Cairo, the capital, a city of 654,000 inhabitants. For thousands of years Cairo or its immediate neighbourhood has been the largest city in Africa, for although modern Cairo was only founded in the seventh century, the old city of Memphis is adjoining. The population of Egypt spreads out fanwise along the delta of the Nile. Here, while the population is mainly agricultural, there are some considerable towns, and the whole region is traversed by a network of canals and light railways. The principal of these inland towns are Damnahur, capital of the Behera province ; Tantah, capital of the province of Gharbiya; and Mansura, a flourishing commercial town and centre of a cotton district, on the Damietta branch of the Nile. South of Cairo are Assiut, a great trading centre, where there is a barrage across the Nile ; and Assuan, where occurs the first cataract, and where a great dam has been erected for regulating the waters of the Nile for purposes of irrigation. Just south of Assuan, the river port of Shellal is the terminus of the railway from Cairo, while on the frontiers of Egypt is Wady Haifa, the terminus of the railway from El Obeid, Sennar, and Khartum.

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A few miles from the left bank of the Nile, some 60 miles above Cairo, is the fertile district of the Fayum, a nearly circular basin or oasis containing numerous large villages, and forming one of the most populated and productive regions of Egypt. Here was the celebrated Lake Moeris and the famous Labyrinth described by Herodotus.

In the Anglo-Egyptian Sudan, Khartum and Omdurman, situated at the confluence of the White and Blue Niles, occupy a most important commercial situation. Other important centres are Atbara, the junction for the railway for Port Sudan ; Berber ; Wad Medani, a large agricultural centre on the Blue Nile ; Sennar, on the Blue Nile ; Kassala, an important commercial and agricultural centre near the borders of Abyssinia ; El-Obeid, the capital of Kordofan ; and El Fasher, the capital of Darfur.

183. *Cities of Tunisia, Algeria, and Morocco.* The majority of the inland cities of Tunisia and Algeria are situated at no great distance from the coast. Tunis, the capital of Tunisia, although situated near the sea and connected with it by a channel cut through the lagoon (El Bahira) on which the city stands, was until recently entirely dependent upon its port of Gulette (or Goletta) for its maritime communications. There are a number of important inland mining centres, such as the walled town of El Kef, but in addition to these Beja and Kairwan are the chief inland towns. The latter is situated about 80 miles south of Tunis, at the outlet from the north across the central range, and may be regarded as the Mecca of northern Africa, because it is an object of pilgrimage and veneration by Moham-medans. In Algeria the chief inland cities are Constantine, 40 miles south-west of its port Philippeville, and occupying a commanding position both on the

railway and on the natural routes throughout the country ; Setif, an important military centre, situated at the highest point (3,523 ft.) on the line from Algiers to Tunis ; Orleansville, a considerable agricultural town in the valley of the Cheliff; Mascara, on the high plateau in the centre of the alfa-growing districts ; Sidi-bel-Abbes, a garrison town about 50 miles south of



XXVI. A Saharan town : Guerrara (from an aeroplane)

Oran ; and Tlemcen, an important trading centre not far from the Moroccan borders. Beyond the Atlas Mountains is a number of important oasis-towns, such as Biskra ; Tuggurt, situated at the centre of the oases of the Wad Rhir ; Colomb Bechar, the terminus of the line from Oran, 465 miles; and Figuig.

In Morocco the chief inland cities are Fez, with a population of 105,000, a great commercial and trading centre; Meknes (Mequinez), about 32 miles south-east

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of Fez ; Marrakesh or Morocco city, once a great centre of population ; Tasa and Udja, trading centres in the north-east; and Wezzan, a city just south of the Spanish zone. In the last district, Tetuan and Alcazar are the chief inland centres.

184. *Cities of West Africa.* With the exception of the cities of Nigeria, the inland towns of western Africa are of inconsiderable size, and depend chiefly for their importance upon their position on the main commercial routes. In French Sudan, Timbuktu, one of the most famous cities of the Sudan, has lost much of its former commercial importance owing to the decay of the caravan traffic across the Sahara. Nevertheless, with its port on the Niger, Kabara, it is still a considerable commercial centre. Kayes, on the Senegal river, at the junction of the railways to the Niger and to Dakar, is a place of some importance. Segu, on the Niger, once the capital of a large native state, is a great trading centre. Bamako, at the terminus of one of the navigable sections of the Niger; Jenne, in the fertile region between the Niger and the Bani rivers ; and Sikasso are other centres of population, but all the above cities have less than 10,000 inhabitants each. Farther east the town of Zinder on the route to Lake Chad is a centre of exchange between Kano and Sokoto and the caravans crossing the Sahara. The whole of this region, forming the hinterland of the coastal colonies of West Africa, is in the main poorly populated, and it is only as the coast is reached that the large centres of population are encountered.

In the Gold Coast, Kumassi, the capital of Ashanti, is a considerable city, but elsewhere until Nigeria is reached there are no large inland towns, the agricultural population being distributed in numberless large villages and small settlements. In Nigeria, especially in the

southern provinces, is to be found the most densely peopled portion of tropical Africa, and there are numerous large cities, many of them walled, and all of them of considerable commercial and agricultural importance. The largest centres of population are to be found, as a rule, in the districts west of the Niger. Thence as the delta is approached the population becomes less. Many of these cities are situated on the railway from Lagos to Kano, which passes successively the important towns of Abeokuta, Lafewena, Ibadan, Iwo, Ileigbo, Oshogbo, Ilorin, Jebba, Zungeru, Minna, Kaduna, Zaria, and Kano. Many of these cities have populations of over 50,000, while Ibadan, the largest native city in tropical Africa, has a population of 175,000, and is the chief commercial town of the Yoruba people. Abeokuta is the centre of the Egba tribes ; Jebba is situated at the point where the railway crosses the Niger ; Minna is the junction for the railway from Baro ; Kaduna has been selected as the capital for Nigeria ; and Kano, with a population of 100,000, is a large walled city and a great trading and commercial centre. In addition to these cities on the railways there are others in the south-west of Nigeria which are of considerable size, such as Ogbomosho, with a population of 80,000; Oyo, 45,000; and Idanre. These places, however, are not infrequently straggling districts rather than cities. Farther east are Benin City, Opomo, Newi, Onitsha, Ibusa, and Opobo, all large towns. On the Niger, Lokoja at the head of the first navigable section, and Baro, the point to which larger vessels can ascend, are large trading centres, while in the north-east Gando and Sokoto are towns of great importance. In the middle of Nigeria, Bauchi is the centre of the tin-mining industry, and farther east Yola, on the Benue, is the capital of an important province.

185. *Cameroons, French Equatorial Africa, and Belgian Congo*, As the centre of tropical Africa is approached, the inland population, still considerable when compared with the southern and eastern plateaus, becomes less, although the thickly populated belt is continued in the coastal districts of western Africa almost as far south as the Congo. There are, however, no great cities in this portion of the continent, although numberless villages, forming in many cases tribal centres, are scattered thickly over this area. In addition there are places which are of importance because of their situation as avenues of trade or as administrative centres. In the area known as Cameroons, and particularly in the northern region of Adamawa, of which Yola is really a part, there is a fairly dense population, and here are numerous native centres, such as Dikoa and Kasserì, Garua, and Lere, the two latter being on the upper waters of the Benue. In the coastal regions such places as Yabassi, Yaunde, Ebolowa, Lolodorf, and Edea, are important trading centres, while Buea on the slopes of the Cameroons Mountain, formerly the capital of the German colony, is a healthy residential station for Europeans. In the Gabun Colony and Middle Congo Colony, forming part of French Equatorial Africa, the principal inland towns are Brazzaville, situated on Stanley Pool, and N'Djole, on the navigable Ogowe river.

In Belgian Congo, with its great forest areas, most of the towns owe their importance to their geographical situation, but all are small in population. Leopoldville and Kinshassa, two neighbouring stations on Stanley Pool, are of importance as the forwarding depots for trade down the Congo; Coquilhatville is situated at the junction of the Congo and Ruki; Stanleyville, situated on the Congo, marks the terminus of a long navigable stretch of that river, as does Ponthierville,

about 170 miles farther south. Kindu and Kongolo form the connecting links between other navigable sections to the north and south of those places, and Kabalo is the junction on the line from the Congo to Lake Tanganyika, on which is situated the important Belgian port of Albertville. Leverville, at the junction of the Kwengo and Kwilo Djuma rivers, is the centre of a new industry in vegetable oils. In the south, in Katanga, Elisabethville, with a considerable European population, and Kambove, owe their importance to the mines, of which they are the centre. In French Equatorial Africa there are few places of importance. Bangui, Fort de Possel, and Mobaye, on the Ubangui river; Fort Crampel on the Gribingui river; Fort Archambault on the Shari river; and Fort Lamy, near the junction of the Shari and Logone rivers, are all important centres of river traffic; while farther north in the Sudan regions, Abeshir, the capital of the powerful native state of Wadai and Chekwa, the capital of Bagirmi, both lying east of Lake Chad, have considerable native populations.

186. *Angola and South-West Africa.* In Angola, San Salvador, the chief town of the former native kingdom of Congo, has for many centuries been a large native centre, having intimate relations with Portuguese missionaries and traders. In the south, Bihe, Caconda, Huilla, and Humbe on the interior plateau are large centres of native trade.

In the South-West Africa Protectorate the principal centres of population owe their importance, in the main, to the presence of European settlers and traders. Windhoek, the capital, is centrally situated on the high plateau in the midst of a good pastoral district; Karibib is situated on the railway from Walfish Bay to Windhoek; Omaruru, on the Otavi railway, is in the neighbourhood

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of important mines; Tsumeb and Grootfontein, in the north-east, are mining centres; Keetmanshoop is important as the junction on the line from Angra Pequena to the central railway; and Rehoboth, on the central line, is a good agricultural centre.

187. *Union of South Africa.* South Africa reproduces in many respects the conditions existing in northern Africa, except that the European population is larger and is congregated in cities that are European in character, having outlying native quarters. All the important urban centres of inland population are connected with each other by railway communication. From Cape Town to Johannesburg and Pretoria there is a number of important towns, such as Stellenbosch, an educational centre, and the Paarl, in the neighbourhood of which much of the best wine in South Africa is produced; Wellington, another centre of viticulture; Worcester, at the base of the Hex River Mountains, and an important centre for fruit culture; Beaufort West, a centre of the wool trade of the Karroo; De Aar, the railway junction on the line to the South-West Africa Protectorate; and Kimberley, the diamond metropolis of South Africa.

Farther north the railway passes through Vryburg and Mafeking, but before these places are reached, a line, passing through Klerksdorp and Potchefstroom, runs to Johannesburg, the chief commercial centre of South Africa, on its way to Pretoria, the administrative capital of the Union. In the Transvaal other important places are Germiston, one of the mining centres, Heidelberg, Standerton, and Pietersburg.

In the southern districts of the Cape Province there is a number of small agricultural towns, such as Swellendam, George, Oudtshoorn, a centre of the ostrich-farming industry, Humansdorp, Uitenhage, and Grahamstown,

the last being an educational centre. In the more central parts of the province are Bedford, Graaf Reinet, and Craddock, while Bloemfontein, the chief city of the Orange Free State, is not only an important railway centre, but also one of the most central places in the Union, and therefore likely to become a much greater city than it is at present. Bloemfontein is the seat of the principal Law Courts of the Union. In the more easterly part of the Cape Province are Queenstown, King William's Town, Butterworth, and Umtata, while in Natal are the city of Pietermaritzburg, the capital of the province, and the towns of Ladysmith, Dundee, Vryheid, Newcastle, and Utrecht.

188. *Rhodesia, British Nyasaland, and Mozambique*, On the high plateau of Rhodesia is a number of European towns with their attached native quarters. The most important is Buluwayo, the principal commercial centre of Rhodesia, and formerly the capital of the Matabeli. It is 1,360 miles by rail from Cape Town. Buluwayo is situated in the midst of a grazing country, and is the centre for numerous gold mines. There are deposits of coal in the vicinity. It is, therefore, destined to become an important centre of population. About 300 miles east of Buluwayo is Salisbury, the administrative capital, situated in an excellent farming area, and like Buluwayo, a gold-mining centre. To the south-east in Manicaland, at a much lower elevation, is Umtali, which forms the eastern gate into Rhodesia. Midway between Salisbury and Buluwayo is Gwelo, another mining centre. On the railway to Katanga is Livingstone, the administrative capital of Northern Rhodesia, situated 4 miles from the north bank of the Zambezi and a few miles from the Victoria Falls. Farther north, Broken Hill is a small mining settlement, while Abercorn and Fife, on the Tanganyika-Nyasa plateau, are other small

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European settlements. Fort Jameson, a small settlement in north-eastern Rhodesia, lies at the centre of a number of converging routes to Tete, on the Zambezi, Lake Tanganyika, and Lake Nyasa, while in British Nyasaland, Kotakota, on the western shore of Lake Nyasa, is the largest native centre on the lake. To the north-east is the island of Likoma, the local headquarters of the Universities Mission, and still farther north on the western side of the lake is Livingstone, another mission station. At the extreme north of the lake is Karonga, and at the extreme south is Fort Johnston. Blantyre, the largest European settlement, is the present terminus of the line from the Zambezi, on which railway also is Port Herald, a settlement on the Shire river. Zomba, situated north-east of Blantyre, is the administrative head-quarters of the colony.

In Mozambique the chief centres of population are on the coast, but Macequece and settlements along the railway from Beira are assuming some importance, the former as a mining centre, the latter, such as Vila Pery and Chimoio, as agricultural centres. Chindio (not to be confounded with Chinde) is situated on the Zambezi, while higher up the Zambezi are the small and ancient settlements of Sena and Tete.

189. *Eastern Africa and Uganda.* The most important inland city in the Tanganyika Territory is Tabora, once a great centre of the caravan traffic, and still a forwarding centre for Mwanza on Lake Victoria. It is the largest native town in this part of Africa. It marks almost the extreme eastern point of the basin of the Congo, and lies on the Tanganyika railway. On the same line, nearer the coast, is Morogoro, the centre of a plantation district; and a few miles south of the terminus of the railway at Kigoma on Lake Tanganyika is Ujiji, a considerable native town, once a great centre of the slave

trade. In the centre of Ruanda is Kigali, and in the south-west of Tanganyika Territory lie Bismarckburg or Kasanga, on the shores of Lake Tanganyika, and New Langenberg (Tukuyu), about 30 miles north-west of Lake Nyasa.

The principal inland places in the Kenya Colony are Nairobi, the capital, situated on the high plateau on the railway to Lake Victoria, Kikuyu, Limoru, Naivasha, Nakuru, Londiani, and Kisumu, all situated on the railway, the last, formerly known as Port Florence, being its terminus on Lake Victoria. At Escarpment, situated at a height of 7,390 ft., 364 miles west of Mombasa, the line suddenly dips into the Rift Valley. To the north of the main line not far from Mount Kenya are Fort Hall and Nyeri, while on the fertile Uasin Gishu plateau is Eldoret, a rising agricultural centre. Entebbe, the capital of Uganda, is situated on the west side of Lake Victoria, a few miles south of Kampala, the native capital of the King of Buganda, and a considerable commercial centre. Fort Portal, on the slopes of the Ruwenzori range, is the chief centre of the fertile Toro district, and is connected by road with Kampala and with the Kilo goldfields. Jinja, just above the Ripon Falls, lies on the north shore of Lake Victoria, and occupies a most important position as the terminus of the Busoga railway and the distributing centre for much of the produce from the north of Lake Victoria.

190. *Abyssinia and Somaliland.* Although Abyssinia contains a considerable population, the towns are comparatively small. Addis Abeba, the capital, lying in the south of the province of Shoa at a height of soixie 8,000 ft. above sea-level, is the terminus of the railway from Jibuti. To the east lies Harrar, an important trading centre of the Galla country, with Dire Dawa, its nearest outlet on the railway. To the north of

Lake Tsana is Gondar, in the province of Amara, and north-east of this city is Adowa, on the borders of Eritrea, the chief centre of trade between the interior of Tigre and the coast. Gambela on the borders of the Anglo-Egyptian Sudan is an important forwarding centre for products going via the Sobat river ; and Lugh, in Italian Somaliland on the Juba river, is a commercial outlet for the south-eastern parts of the country.

XII

ECONOMIC DEVELOPMENT: AGRICULTURAL AND PASTORAL

191. *Native and European Agriculture.* Agriculture in Africa may be regarded from two points of view. It may either be on a comparatively small scale, to meet the needs of the inhabitants, or be carried on for purposes of export to Europe and America. In the former case it is undertaken almost exclusively (except, of course, in South Africa and districts where there is a settled European population) by natives using their own methods of cultivation and growing just sufficient for their own immediate needs, either as members of their tribe or as individual owners and cultivators. In the latter case it may be carried on entirely by natives, as in the cocoa industry of the Gold Coast Colony, or by natives working under European supervision, as on the large plantations in Cameroons, East Africa, Angola, Mozambique, and elsewhere, or on the farms of Europeans, as in South Africa. In any case native labour is the essential factor in all African agriculture.

Regarding African production from the European point of view, it should be noted that until recently the only important commerce has been connected with the

two extremities of the continent, especially Egypt, Tunisia, and Algeria in the north, and Rhodesia and the Union of South Africa in the south. Local exchange of products has been small in the north owing to the similarity of climate and products. In the south, with its greater variety of climate, there has been, on the whole, a larger interchange not only within South Africa itself, but between South Africa and Europe.

192. *Transition from Native Agriculture.* The period of transition from native cultivation (i. e. for native purposes only) has naturally varied considerably in different parts of Africa. In northern Africa (with the exception of Egypt, which economically stands by itself), in the Sudan generally, and in western Africa and eastern Africa, typical products of arid regions such as dates and gum arabic, typical forest products such as rubber and palm-kernels, and typical savanna products such as fibres and earth-nuts, depend largely upon European enterprise for their entry into the markets of Europe. Owing, however, to the fact that much of this territory has been unsuited to European settlement, the process of development has been slow, and has been dependent in a large degree upon the existence of good ports and railways. Until the highlands of east Africa and the country around the great lakes were made available by the construction of the Uganda railway from Mombasa, or by the railways from Tanga to the Kili-manjaro district and from Dar-es-Salaam to Tanganyika, production was practically confined to the coastal districts, in spite of the fact that the Portuguese had for some centuries been settled at the principal harbours. Throughout vast areas in Mozambique and Tanganyika Territory this is still the case. Similarly in western Africa, the presence of Europeans on the coasts led to no increase of agriculture until communication with the

interior had been opened, and even now the greater part of the agricultural production of these regions comes from within easy distance of the coasts.

In southern Africa the position has been somewhat different, as the period of transition has been marked by the introduction of new commodities unknown to natives, such as wheat, maize, wool, wine and brandy, fruit-growing, sugar, and tobacco. Here, in fact, European intrusion has effected a complete change in agricultural methods, which is not entirely the case elsewhere in Africa.

193. *Fibre Plants: Cotton.* Of the typical products of Africa, apart from food, cotton is perhaps the oldest, because it has been grown for ages in the valley of the Nile and in the Sudan, Nigeria, and West Africa generally.. For centuries the people of northern and western Africa have been clothed in cotton fabrics, and the great cotton markets in Egypt and at Kano have been important distributing centres. The Hausa States of Nigeria have long been a great cotton district. The weaving industries established at Kano, Zaria, and elsewhere have exported their woven cloth as far north as Tripoli, and to this day there is a great demand for the native product throughout Algeria. At the present time the principal cotton-growing areas in Africa are Egypt, whence cotton to the value of over £27,000,000 has been exported in one year : the Anglo-Egyptian Sudan, where the chief cotton-markets are Wad Medani on the Blue Nile, and at Tokar on the Red Sea ; Uganda, especially between Lake Kioga and Mount Elgon ; Nigeria, particularly the districts between Ibadan and Oshogbo, and on the high plateau around Zaria, and Nyasaland. In the Anglo-Egyptian Sudan the irrigation works being erected at Sennar and in the Tokar and Kassala districts will open a vast area of suitable soil for cotton. Others exist

around Kismayu and in Jubaland generally ; in certain districts on the great lakes ; and in the great bend of the Niger. The area around Lake Chad, which like the country in the great bend of the Niger is subject to inundation, is stated to be well suited for cotton. The Lake Chad area is one of the richest districts in Africa, but has still to be developed. The land in the neighbourhood of the lake is black cotton-soil similar to that in the Anglo-Egyptian Sudan. The extension of the railway from Kano in this direction would open an extensive area extending to Tibesti and Darfur. In South Africa the rich alluvial land of the Kafue valley, between Livingstone and the Congo borders, is believed to be specially suitable for cotton. In Mozambique cotton has been largely a failure, but it is still in the experimental stage, while in Tanganyika Territory the production has shown a continuous decline. In South Africa, cotton is in the earliest stages of development, being confined mainly to the north-western areas of the Transvaal. A considerable area is under cultivation in north-eastern Rhodesia, and on the banks of the Kafue river.

194. *Sisal and Flax*, Next to cotton, sisal hemp, although of recent introduction, is the most considerable fibre crop of Africa. Large areas have been planted in Tanganyika Territory, in Kenya Colony, and Mozambique, in the less humid parts of these territories and generally away from the coastal rains. Sisal has also been planted in Nyasaland, Natal, and elsewhere, and thrives on poor soil with a not too abundant rainfall. Owing to the cost of production and the amount of labour required, sisal is essentially a plantation product, requiring a large capital outlay. Other fibre plants, such as *Fureraea* or Mauritius hemp, *Sansevieria* another form of hemp, kapok or silk-cotton, and New Zealand flax, are either indigenous to certain parts of Africa or grow well when

cultivated. Their region is mainly along the eastern coast-lands of Africa. Flax is grown in Kenya Colony.

195. *Vegetable Oils and Fats.* The enormous demand for vegetable oils of all kinds has resulted in the establishment of a great industry, particularly in West Africa, dependent upon the natural products of the soil and making a large demand upon native labour. The use of these products in the preparation of margarine, soaps, so-called olive-oils, and lubricating oils, and for other industrial purposes, has brought great prosperity to many African countries. By far the most important of these products is the oil-palm of West Africa, which grows in the coastal forests and supplies the palm-kernels which are exported from Nigeria, Cameroons, Sierra Leone, and other West African colonies. The oil-palm is a native of West Africa from Senegal in the north to the Congo basin and Angola in the south, and is most plentiful from Sierra Leone to Cameroons. In large districts oil-mills, under European management, have supplanted the wasteful native methods of obtaining the yellow oil from the pericarp or covering of the kernel, but the kernels themselves are generally exported and the rest of the oil pressed out in Europe. Fibre is also obtained from the young leaves of the oil-palm. From Nigeria palm-kernels and oil to the value of nearly £5,000,000 are exported, mainly from the coastal districts, the total value for West Africa reaching nearly £10,000,000. Attempts to introduce the oil-palm into East Africa have not been successful. In Belgian Congo the palm-oil industry has been established on a large scale.

196. *The Ground-nut.* Next to the oil-palm, the ground-nut (or earth-nut) and coco-nut are the most valuable oil-producing products. The cultivation of the ground-nut is easy, and it forms the largest item of export from

the French West African colonies. Enormous quantities are grown in the district between Saint Louis and Dakar in Senegal, in French Guinea, and in the French Sudan. In Nigeria the opening of the railway to Kano greatly helped this industry, the amount sent from Kano increasing from 4 tons in 1908 to 41,000 tons in 1917. In the Gambia Colony it forms the staple product. The sandy plains in northern Nigeria are favourable for the plant. Although not indigenous to Mozambique, it is cultivated on ground newly cleared of scrub and forest, and as it is essentially a native industry it is popular with the natives.

197. *The Coco-nut.* The coco-nut palm, which only grows near the coast or along the estuaries of rivers, is found all over Africa north of the Tropic of Capricorn, and generally, though not entirely, south of the date-palm line. Where the coco-nut grows naturally, it is gathered by the natives. Elsewhere, as in Mozambique, large plantations have been established, as is the case with the oil-palm in Cameroons. In Kenya Colony there are stated to be about one million acres of good coco-nut land. The dried kernel of the coco-nut is called copra, and the fibre is utilized for door-mats, sacking, and ropes.

198. *The Shea-nut.* The shea-butter tree, first described by the explorer Mungo Park, grows in those parts of west and west-central Africa where the oil-palm does not. In northern Nigeria it flourishes over large areas, and in the north of Ashanti, beyond the evergreen forest. The fat from the nut of this tree is used by the natives as a food, and it is also exported for soap-making. An excellent butter is also made from it, and a large industry is developing.

199. *Other oil-producers.* Throughout the Sudan, and in most parts of tropical Africa, sesame or simsim is an

important product, being used both as a food and as an oil-producer. Cotton seed is exported wherever cotton is grown ; Mafurreira is extensively gathered, especially in Mozambique ; and the castor-oil bean is indigenous to most parts of tropical Africa. Olives are largely cultivated in Algeria.

200. *Cocoa*. The cocoa industry of western Africa has rapidly become one of the most important industries of Africa. The prosperity of the Gold Coast, where it is extensively cultivated by the natives, is mainly dependent upon this product, which is also largely cultivated in Nigeria and other West African colonies. In Cameroons it is mainly confined to the large privately-owned plantations. Cocoa is not indigenous to Africa, and was only brought there late in the nineteenth century, although grown on the Spanish island of Fernando Po and on the Portuguese islands of San Thome and Principe, where there is a large industry. It was not exported from the Gold Coast until 1891. In connexion with cocoa the kola nut should be mentioned, as from it is produced a stimulating drink, greatly prized by the natives. Large quantities of kola nuts are exported from Sierra Leone to other parts of West Africa.

201, *Grains*. In the Mediterranean area of northern Africa all the grains cultivated in Europe can be successfully grown. In Algeria, in the comparatively small area of highly fertile plains and valleys in the neighbourhood of the coast, wheat, barley, oats, and maize are grown. In Morocco and Tunisia considerable quantities of cereals are also grown, as also in Egypt. In the Anglo-Egyptian Sudan the principal cereal is *dura* (millet). All these countries export the surplus of their cereals to Europe.

Wheat, which can be grown where there is a comparatively small rainfall if at the right season, is

cultivated extensively in the western parts of the Cape Province and in the south-eastern portions of the Orange Free State. Wheat is also grown in the highlands of Angola, on the plateau to the north of Lake Nyasa, and in the high country through which the Uganda Railway passes, but the suitability of each district has to be tested by experiment.

202. *Maize* is successfully cultivated in many regions of Africa, notably southern Morocco, the Futa Jallon plateau, the high plateau within the great bend of the Niger, the Angola plateau, the valley of the Nile, the plateau of East Africa and all along the east coast of Africa, the high country of Manicaland and Rhodesia generally, and throughout the Union of South Africa, east of a line running from Algoa Bay to Bedford, Cathcart, Aliwal North, Bloemfontein, and thence to Lichtenburg and Zeerust. From this area, the coastal belt below 1,000 ft. and the region above 6,000 ft. should be excluded. Maize is the principal cereal in South Africa, and the Transvaal is the greatest productive area. Large quantities are exported, and it forms the staple food of the natives employed in the mines. The maize * cobs ' are called mealies. In Southern Rhodesia the crop forms some 86 per cent, of the cultivated produce. In Kenya Colony maize is the principal crop and is the staple food of the natives.

203. *Barley*. The conditions which favour the growth of wheat are also favourable to barley, but it has a wider climatic range and does well away from the coast of Libia, along the more arid portions of the Niger from Timbuktu to Say, in the high plateau of Nigeria, and in Abyssinia.

204. *Oats and Millet*. Oats are not grown to any large extent in Africa, except in Algeria and the southern portions of the Cape Province. Millet is grown generally

throughout Africa, and forms one of the staple foods of the natives. The variety known as Kafir corn is general throughout the Union of South Africa; that known as Guinea corn is usual in West Africa ; and that known as *dura* is mainly confined to Egypt and the Anglo-Egyptian Sudan.

205. *Rice* is specially identified with tropical and sub-tropical lands where there is an abundant rainfall. Hitherto, comparatively speaking, little has been cultivated in Africa, although numerous areas are known to be suitable for its cultivation, including the coastlands of French Guinea, the upper valleys of the Niger, the delta of the Nile, the East African coastal area south of Zanzibar and north of Mozambique city, together with the lower parts of the Limpopo and the Quelimane district, and the Mwanza district south of Lake Victoria. The African native does not as a rule eat rice, nor does he cultivate it in paddy-fields, as is commonly done in the rice-lands of Asia.

206. *Tobacco* has become one of the principal crops of South Africa, the Transvaal being the largest producing area. Large quantities are also grown in Southern Rhodesia, especially around Salisbury and Buluwayo, and in Nyasaland, chiefly for local use though there is a growing export. In Egypt tobacco is extensively grown, but elsewhere the crop is grown only for native use, with the exception of Algeria, from which there is a considerable export.

207. *Sugar*, which is largely cultivated in Egypt, is not much grown elsewhere in Africa, with the exception of Mozambique and Natal, and to a smaller extent Angola, although many coastal districts are well suited for the crop, particularly French Guinea, Nigeria, Cameroons, and Kenya Colony. , In Natal the industry is firmly established, and is largely worked by Indians.

Mills have been erected, and there are thousands of acres under cultivation, land along the coastal flats yielding very large crops. In Mozambique sugar is grown along the Komati river, near Inhambane, on the Pungwe flats and the alluvial flats along the Zambezi and Busi rivers, and in the neighbourhood of Quelimane, mainly on the estates of large plantation companies, and it supplies the most important industry of the country.

208. *Tea and Coffee.* The presence of Indian labourers in Natal gave an impetus to the tea industry in that country, but the area under cultivation is small, and the tendency is to abandon its cultivation in favour of sugar. Elsewhere in Africa the only district where tea is cultivated is in the highlands of Kenya Colony and Nyasaland, but labour is difficult to get.

Coffee is indigenous to Africa, and is cultivated in numerous districts on a small scale and largely in the south-western portions of Abyssinia. Here the province of Kaffa, from which the plant takes its name, has long been celebrated for its coffee. In Mozambique coffee is grown around Ibo and in the elevated portions of Portuguese Nyasaland bordering upon British Nyasaland, where it is also grown ; and it can be grown in Natal, the warmer parts of the Transvaal, and in Rhodesia. It is also grown extensively in Uganda, where there are two crops during the year, and in the highlands of the Kenya Colony. Apparently coffee chiefly thrives in Abyssinia and the neighbouring districts. Elsewhere it has never been satisfactorily cultivated to withstand the effects of disease or to produce the best quality. In Liberia, where coffee is indigenous, the product is not very good.

209, *Rubber.* The greater part of tropical Africa produces rubber in one form or another. The three sources of indigenous supply are from trees, climbers,

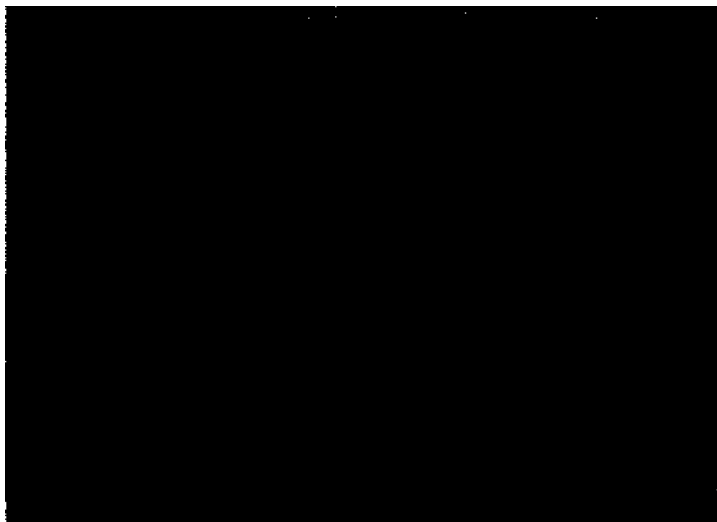
and grassy or shrubby plants. The wet jungle of the Congo basin, the hot coastlands of Mozambique and East Africa generally, and of Angola, produce the various types of *Landolphia*, which may be either shrubs or climbers ; on the higher and dryer land around the basin of the Congo the chief source of supply is *Funtumia*, a plant which is also largely used in regular plantations, and is found in all the West African forests, especially in Liberia and Cameroons. In many parts of Africa, plantations of the South American varieties of rubber have been started, both *Manihot* (Ceara) and *Hevea* (Para), which thrive where there is a heavy rainfall and a high temperature. This is a recent industry, and the indigenous varieties still largely hold their own—mainly owing to the cost of production of plantation rubber.

210. *Spices*. Large quantities of chillies are grown in Uganda, Egypt, and the Anglo-Egyptian Sudan. Cloves come almost entirely from Zanzibar and Pemba, where the Arabs established large plantations and secured the monopoly of this product throughout Africa. Most of the world's supply comes from these two islands.

211. *Alfa*. Alfa or esparto grass grows on the high plateaus and in the sub-desert regions of the Mediterranean and the Sudan, both north and south of the Sahara, but more particularly in the high region enclosed between the mountain ranges of Algeria, where conditions are specially favourable for this product. It is used especially for paper-making.

212. *Fruits*. Fruits are grown in, or exported from, practically every part of Africa, and they vary from those of the Mediterranean zone, such as the oranges and grapes of Algeria and Tunisia, to the bananas, pawpaws, and mangoes of the hotter regions. The chief wine-producing countries of Africa are the Mediterranean lands of Algeria and Tunisia, and the south-

western districts of the Cape Province, where Mediterranean conditions are also found. In this portion of the Union the production of soft fruits, such as grapes, peaches, apricots, plums, and pears, is in excess of local needs. These and many other fruits are now grown in the Union and in Rhodesia for export, more particularly oranges, pineapples, and peaches, and the variety of fruits



XXVII. Mediterranean cultivation : Tlemcen

is large owing to variations of climate. Bananas are grown in Natal and mangoes in the eastern Transvaal.

213. *Dates.* The date palm flourishes throughout northern Africa, more especially in the oases, where it forms a staple food and whence vast quantities are exported to the markets of Europe. While the coco-nut palm is a lover of damp heat, the date palm only flourishes where the climate is dry. But for this palm, large sections of country in the desert and semi-desert areas would be uninhabitable. The extension of railways into

the extreme south of Algeria has enabled the produce of these districts to be brought to the coast and has resulted in the establishment of a flourishing industry, and elsewhere the produce is carried by caravans of camels. The principal centres of date culture are the oases of Tafilet, in the south-east of Morocco, the oases along the Wad Rhir, in south-east Algeria, where there are some 1,600,000 date palms ; the oases of Wargla, Tuat, and Tidikelt, and of Fezzan, especially at Ghat.

214, *Cattle and Sheep*. Although some African tribes are pastoralists, the bulk of African peoples are agriculturists. Almost purely pastoral peoples are the Hereros of the South-West Africa Protectorate, who have been largely reduced in numbers by their wars with the Germans. Ruanda, the north-west portion of the former German East Africa, also is a country of great pastoral wealth. Large areas of Africa are suitable for cattle and sheep, though throughout others the presence of flies and diseases which attack cattle, such as the rinderpest, prevent successful pastoral industries. Rhodesia and the South African plateau generally are well adapted for cattle-raising and sheep-farming ; sheep being mainly confined to the Cape Province and the Orange Free State, and cattle to the Transvaal and Rhodesia. The sheep of South Africa, which are not of the native variety, are bred mainly for their wool, large quantities of which are exported, chiefly through Port Elizabeth. In Rhodesia the British South Africa Company have established large cattle ranches. Kenya Colony is also a great cattle country, especially on the high plateau of the interior; while the grasslands of the Sudan offer possibilities for the establishment of a cattle-breeding industry, particularly in the regions north and east of the Niger. In the Anglo-Egyptian Sudan the great cattle markets are El-Damer and Omdurman, which, however, are mainly

distributing centres for cattle bred on the Kassala plains, Kordofan, and Darfur.

The native cattle of Africa are much inferior to European varieties, but with the introduction of better kinds much has been done to improve the original stock. The cattle of Africa are particularly subject to two diseases—rinderpest and East coast fever. Preventive inoculation has stopped the ravages of rinderpest. East coast fever has done enormous damage throughout East Africa, and no known measures can stop the disease when it has once appeared. Various kinds of tsetse-fly are also particularly fatal to live-stock—the donkey and the goat alone being more or less immune. The tsetse-fly is very widely spread throughout tropical Africa, large areas being infected in Uganda, Tanganyika Territory, Belgian Congo, Angola, Rhodesia, and Mozambique, and cattle-breeding is impossible in the infected districts. Moreover, in these areas, cattle cannot be used for purposes of transport. The tsetse-fly, of which two kinds are responsible for the deadly sleeping sickness which attacks man, is confined to the neighbourhood of water-courses, swamps, and stagnant water generally. Away from these sources of infection, cattle will thrive wherever the grasslands are suitable.

XIII

ECONOMIC DEVELOPMENT: MINERALS

215. *Labour in the Mines.* Many parts of Africa are rich in minerals, and in certain districts mining has been highly developed, resulting in a corresponding agricultural development in order to supply the needs of mining districts. In the southern parts of Africa the

mining industry has disarranged the distribution of native labour, as large numbers of workers have had to be obtained from considerable distances from purely agricultural areas, which might have been more rapidly developed had the local natives been available for agricultural work in their own districts. On the other hand, without this imported labour the development of South Africa would have been much slower, and workers on the Rand and elsewhere, when returning to their homes, are able to carry back considerable sums of money, but they also take with them the vices as well as the benefits of civilization. From Portuguese East Africa, which is not a densely peopled country, thousands of natives emigrate for considerable periods, not only to the mines of the Transvaal and Rhodesia, but also to British Nyasaland for agricultural work, to the mines of Katanga, and to the cocoa plantations of San Thom .

216. *Principal Mining Areas.* The principal developed mining regions of Africa are in Algeria, the Gold Coast and Ashanti, Katanga, Southern Rhodesia, the Transvaal, the Gabun Colony, Natal, and Madagascar ; but other countries known to be rich in minerals, such as Futa Jallon, Abyssinia, Angola, and the north-eastern part of the Belgian Congo, are either entirely undeveloped or only in the early stages of development,

217. *Gold* is widely distributed throughout Africa, and has been worked from the earliest ages. The Phoenicians are believed to have traded along the west coasts of Africa for gold which was brought to them by the natives and exchanged for other products. In the centre of the Nubian Desert are the remains of ancient gold workings, and the extensive ruins of an ancient gold-mining people are to be found in Matabeleland and Mashonaland, the former native kingdom of Monomotapa, particularly at the Great Zimbabwe,

where there is an immense stronghold evidently erected for the protection of the gold-workers. Whence these people came and whither they went is at present one of the great mysteries of Africa ; but it is generally agreed that they were not of the negro or Bantu race. Round stone huts, similar to those existing in the Nubian Desert, were also at one time in existence near Zeerust, in the extreme west of the Transvaal, showing the wide range of the ancient gold-workers.

218. *Gold in the Transvaal.* Most of the gold mined in the Transvaal is obtained from a great depth from the mass of hard rock in the Witwatersrand. Alluvial gold (i. e. gold found on or near the surface) only accounts for a small fraction of the total output, and comes from deposits in the Pietersburg, Barberton, and Pilgrim's Rest districts. The Witwatersrand, which is the chief gold-mining area in Africa, and accounts for considerably more than a third of the world's total output, is an elevated ridge crowning a plateau nearly 6,000 ft. above sea-level, which forms the divide between the tributaries of the Vaal and Limpopo rivers. It stretches for some fifty miles east and west of Johannesburg, the commercial centre of the district and the largest city in South Africa, and its prosperity is entirely due to the neighbouring mines. Gold to the value of nearly £40,000,000 is now produced annually from these mines and others in the Transvaal.

The gold-bearing beds of the Witwatersrand are locally known as reefs, and they strike east and dip south. Here the main reef is frequently reached at depths of 2,500 to 3,500 ft., and some mines are worked at a much greater depth ; while it is computed that they may be workable at a vertical depth of 10,000 ft. from the surface.

Farther west the Krugersdorp (Klerksdorp) gold-

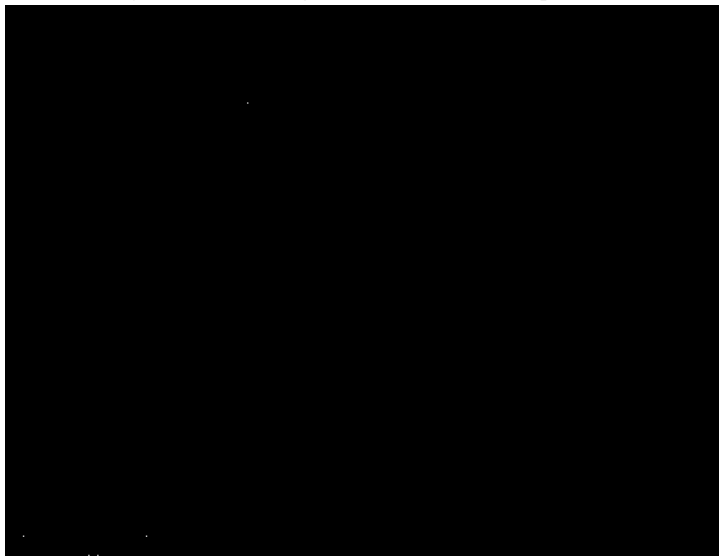
fields probably form a continuation of the same reefs, as may the Ventersdorp mines, a little to the east. In the extreme east of the Transvaal on the borders of Swaziland, the Barberton area, and to the north-west of this, the Pilgrim's Rest, or Lydenburg, gold-fields, at one time important alluvial diggings, are minor gold-bearing areas. In the Pietersburg district and along the Murchison range, quartz-mining is also carried on, but here the climate is unhealthy and the treating is difficult.

219. *Gold in Rhodesia.* The Rhodesian gold-fields, to which may be added the Tati district on the route from Palapye in Bechuanaland to Buluwayo, produce gold to the value of nearly £4,000,000. The principal fields are around Buluwayo, Gwelo, Selukwe, and Gatooma in Matabeleland, and in the Hartley, Victoria, Mazoe, and Salisbury districts in Mashonaland. Farther east in the Umtali district in Manicaland there is a small mining development, which is also extended, in a less degree, on the other side of the Portuguese border, around Macequece. Elsewhere in Mozambique gold is found, and worked to a small extent, in the Tete district, which is honeycombed with ancient workings.

220. *Gold in West Africa.* In West Africa the principal gold-mining area is in the Gold Coast, where, apart from gold-washing in the rivers, there is a considerable industry established in the Prestea, Tarquah, and Abosso districts, as well as farther north in Ashanti. Gold is also present throughout the high plateau behind the coastal areas, but more especially west of Nigeria and in the Futa Jallon country, but no development work has been undertaken. In the north-east corner of Belgian Congo, about 75 miles west of Lake Albert, a great gold-bearing area is being developed, but operations at present are confined to alluvial mining. It is

believed that this area, known as the Kilo and Moto gold-fields, extends north-east towards the Nile.

221* *Diamonds* are found in three well-defined districts in South Africa. Their discovery in the volcanic formations of Griqualand West (Cape Province) led to the establishment of a great mining industry at Kimberley and its neighbourhood. The production of



XXVIII. Diamond mine, Kimberley

diamonds from the mines within the Cape Province is practically confined to the De Beers Company, whose mines are known as the Kimberley, De Beers, Wesselton, Bullfontein, and Dutoitspan. Farther south-east, in the Orange Free State, are the Jagersfontein and Koffyfontein mines, while in the Transvaal is the largest-diamond mine, known as the Premier, which lies 25 miles east of Pretoria, where the largest white diamond ever discovered and called the Cullinan (weighing if lb.)

was found in 1905. Diamonds are also worked near Gwelo and elsewhere in Southern Rhodesia, and considerable quantities of diamonds have been washed from surface deposits in the neighbourhood of Angra Pequena in the South-West Africa Protectorate on the Pomona diamond fields. In addition alluvial diggings exist on the Vaal river at Barkly West, a few miles north of Kimberley, and elsewhere along that river. The value of diamonds produced in the Union of South Africa in 1917 was £7,700,000.

In Belgian Congo diamonds are widely distributed, and mining is carried on in the valley of the Kasai.

222. *Coal.* The great coal-bearing areas of the continent lie in South Africa ; the northern portions of Africa, with two or three exceptions, have none. For this reason a country like Egypt, which is densely peopled in the delta and valley of the Nile, must always remain mainly an agricultural land, whereas the Union of South Africa may in time become a considerable manufacturing centre. Algeria, which is rich in iron, possesses hardly any coal, although in the far south a small deposit is worked in the neighbourhood of the railway at Colomb Bechar. The discovery of an extensive coal area at Udi in Nigeria will be of great value in the development of West Africa, as it is the only coal supply for use on the railways.

In the Union of South Africa the presence of coal close to the gold deposits of the Rand, and in some cases actually overlying them, has been of value in supplying the necessary power for the development of the mines. It is, moreover, of great importance for the cheap working of the South African railways, and has also an effect upon ocean communications, as large quantities are exported from Lourenço Marques and Durban for use on steamships and even for export

overseas. In the Transvaal some 5,000 square miles, with an estimated supply of 36,000,000,000 tons, are suitable for working. The principal coal-mining areas are in the Witbank and Middelburg districts. Coal is also mined in the Dundee district of Natal and also in the Vryheid and Utrecht districts, and it is present and is worked in various parts of the Cape Province and in the Orange Free State and Swaziland. In Rhodesia coal exists on both sides of the Zambezi and in numerous scattered districts, but the present source of supply is the Wankie coal-fields on the Gwaai river, some 200 miles north-west of Buluwayo. There are also coal areas in, and in the neighbourhood of, Katanga. In Mozambique coal exists along the Zambezi over a stretch of 190 miles, and in numerous other districts, as well as on the Anglo-Portuguese frontiers of Nyasaland and in the neighbourhood of Porto Amelia, but very little has been mined.

223. *Iron* has been worked in Africa from a very early age, but apart from native workings little industrial use has been made of the iron-ore. Iron deposits exist throughout South Africa, and were worked in bygone ages. At present no iron-ore is exported from South Africa, but blast furnaces have been established at Vereeniging, Boksburg, Newcastle, and Pretoria. In the last city an iron and steel industry on a large scale may be established, as there are enormous deposits in the immediate neighbourhood. In Tunisia there are great deposits of iron-ore in the Kroumirie and Nefza districts and also around Nebeur, in all of which areas mining is in active operation. In Algeria similar deposits are worked at Ain Mokra, near Bone, and also between Beni-Saf and Tlemcen. Iron-ore is widely distributed throughout Morocco, especially in the mountainous Rif country, the principal mines being in the neighbourhood of Melilla.

In the Gold Coast a large manganese area is being developed about 30 miles from Seeconde. In French Equatorial Africa, in the Gabon Colony, the Minduli mines, situated about 100 miles west of Brazzaville, and connected with that place by an industrial railway, export a considerable quantity of ore. In Portuguese Nyasaland there are large deposits of iron ore, especially in the elevated plateau, but, as in most other parts of Africa where iron is present, the only use made of the ore is by natives, who work it in rough forges. In most cases, however, if the ores are to be of any commercial value, they will have to be treated locally, as the cost of carriage to the coast would probably be too great. In Natal, where iron ores underlie the coal measures, carriage to the coast would not be difficult, owing to the steady descent to the sea. Extensive deposits of chrome iron are worked in the Selukwe district, south of Gwelo, in Rhodesia, which supplies half of the world's output of chrome iron, and other deposits are in the Victoria district.

224. *Copper.* Four great copper-producing areas are worked. The principal of these districts is in Katanga. No part of the continent is better watered, more heavily timbered, more naturally productive, or more rich in mineral resources than this central African province. Katanga is becoming the centre of a competition for railway traffic between the three ports of Lobito Bay, Beira, and Dar-es-Salaam, which will soon be competing for the industrial traffic of the district, which at present almost exclusively flows through Beira and the South African ports. The copper belt of Katanga extends from Elizabethville to Ruwe. The Kansanshi mine, some 70 miles west of the railway, lies on the Anglo-Belgian borders. The output of smelted ore is nearly 30,000 tons per annum.

The second great copper area lies in the northern Transvaal, where the mines at Messina are reached by two railways from the south. These mines lie just south of the Limpopo river, and large smelters have been erected. The Messina mine and similar mines in the neighbourhood are situated where there have been ancient workings, possibly of pre-historic miners of Indo-European stock.

The third great area is in Namaqualand, in the dry country for which Port Nolloth, in the north-west of the Cape Province, forms the outlet. Here in the elevated country around O'okiep and Concordia, about 3,000 ft. above sea-level, are very rich mines with smelting-works, situated in country not unlike that of the Otavi, Tsumeb, and Grootfontein districts in the north-east of the South-West Africa Protectorate, whence large quantities of copper are sent by rail to the sea at Walfish Bay and Swakopmund. This portion of South-West Africa and the ranges extending throughout the centre of the country are rich in minerals, as also is the Kaokoveld, in the north-west, where there are large unworked deposits of iron-ore.

225. *Lead, Graphite, Zinc.* These are widely distributed throughout Africa, particularly in the region extending from Katanga southwards. Large deposits of lead and zinc occur in north-east Rhodesia, especially at Broken Hill, but the ore is difficult to treat. Graphite is extracted in the Zoutpansberg district of the Transvaal, and tin is exported from Northern Nigeria.

226. *Phosphates* occur in Tunisia and Algeria, in an area stretching from Tebessa to Gafsa. Phosphate from the Tebessa district is exported through Bone, and that from the Gafsa area through Sfax. Important phosphate areas also extend northwards to the Kalaat-es-Senam region of Tunisia. Similar deposits exist in

Morocco in the area south-east of Settat. Deposits also exist at Saldanha Bay in the Cape Province. Guano is obtained from the islands off the south-west African coast.

227. *Mineral Oil.* Mineral oil has been discovered in various parts of Africa, but no great industry has yet been established. It exists in Egypt, near the Red Sea, from which there is an increasing export, Nigeria, Angola, Mozambique (Inhambane district), and the Cape Province, Transvaal, and Natal. Outcrops of oil shale have been reported at intervals along the escarpment of the Drakensberg for hundreds of miles.

228. *Soda and Salt* Soda is largely an African product. It is obtained in various forms from the Natron Lakes, south of Alexandria, and from the lakes along the Suez Canal, from the Lake Chad area, the lakes of the eastern rift valley, and the salt-pans of the Transvaal. Great deposits exist at the so-called Magadi Lake, and other 'lakes' in Kenya Colony. Rock-salt is obtained from various places in the Sahara, and there are numerous salt-pans in South Africa and elsewhere.

XIV

INDUSTRIAL POPULATION AND SOURCES OF POWER

229. *Manufacturing Districts.* Except in northern and southern Africa, manufactures have been almost entirely native, such as the making of cloths and other articles of native use. It has been said that Africa will never be a manufacturing country, but will always remain a land of agricultural and mineral production. This may be true, in the main, of those countries which

lie within the tropics, though even here there may be exceptions. It is untrue of the Union of South Africa. There the tendency is for manufacturing industries to be established, and with plenty of coal and minerals, there is no reason why manufacture on a large scale should not be established in time. The chief trouble is the supply of labour, which cannot be taken from the work of agriculture and mining without loss to the country. But the native population is increasing rapidly, and numerous industries have been established in South Africa, particularly in connexion with articles of food and drink, the making of boots and shoes, furniture, wagons, soap and candles, and other such industries. In the heavier industries connected with iron and steel (e. g. the making of machinery), crockery and glass, as well as in the textiles and all industries requiring high technical skill, it is not likely that any large industries will be established for many years. In the main, therefore, Africa is, and will remain for a long period, a source of raw materials.

230. *Industrial Population.* Generally speaking, there is no industrial population in Africa, with the exception of those who are engaged in agricultural labour, such as the Fellahin of Egypt, and the workers employed more or less continuously by European planters. Elsewhere native labour is seasonal or intermittent, and even in the areas of densest population, such as the Hausa States of southern Nigeria, no section of the people can properly be termed industrial. In the chief mining areas, however, there are considerable industrial populations employed in the business of mining. The Witwatersrand employs fully 200,000 native miners, who, although they do not settle permanently and are constantly changing, may for the time being be regarded as an industrial people. Kimberley is another of these

areas; but the only true industrial population outside the northern countries of Africa is found in Natal. Here there is now resident a large Indian population, numbering at one time over 120,000, who were originally imported to work on the sugar plantations, and of whom many have settled in the country.

231. *Native Cities.* With the exception of northern Africa and those portions of the continent where Europeans have largely settled, there are few large African cities (see also § 182). The largest native city, outside these regions, is Ibadan, in Nigeria, with a population of 175,000, and in the same area are several other large centres of population, such as Oshogbo, Ilorin, Abeokuta, Zaria, Kano, and Sokoto. There are some considerable centres of population in the French West African colonies, particularly Segou, Jenne, Kankan, and Sikasso, all important trading towns, but Timbuktu, though a most important centre of exchange, has a comparatively small resident population. In the eastern Sudan, Khartum and Omdurman, with Sennar, El Obeid, and El Fasher, are important centres of population. Elsewhere the native cities of Africa are small, although in South Africa large native settlements have become established in connexion with the large European centres of population, such as Johannesburg, Pretoria, Cape Town, Port Elizabeth, Bloemfontein, and Durban. These, however, are not true native cities, which cannot be said to have existed in South Africa, where the various tribal centres have been moved, as a rule, from place to place. Thus Shoshong, in Bechuanaland, formerly the capital of the Bamangwato tribe, was deserted in favour of Palapye, which was in turn left for Serowe, the present capital.

232. *Distribution of Native Population.* The native population in Africa, therefore, is widely distributed

over considerable areas (and not gathered together into cities), although its density varies in different parts of the continent. In the main, the areas of greatest population are those where, outside the forest regions, there is the greatest rainfall, or where irrigation is possible. The coastal region of West Africa from Sierra Leone almost to the Congo, with the whole of southern Nigeria and a great part of northern Nigeria, is an area of dense population, having an average of over forty inhabitants to the square mile. Similar areas are to be found in the Atlas countries, around Tripoli, in lower Egypt, on the western shores of Lake Victoria, on the coasts of East Africa between Mombasa and the Rovuma river, and in the coastal regions of South Africa from the Cape of Good Hope to Delagoa Bay. A less densely peopled region is the basin of the Congo, French Equatorial Africa, and the region extending thence to the Red Sea, and Abyssinia, French Guinea, Senegal, and the western portions of the French Sudan, and the delta of the Zambezi; but elsewhere the native population is comparatively sparse, although with the cessation of tribal warfare, especially in the British South African territories, it is increasing rapidly.

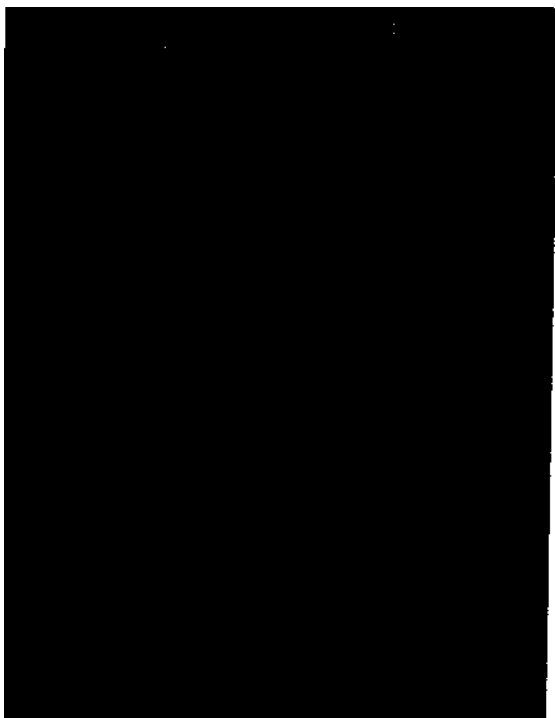
233. *Sources of Power.* Africa contains vast reserves of water-power that may some day be utilized for the generation of electricity. The cataracts and rapids on the Nile are a great possible source of power, particularly those between Jinja and Namasagali, where are the Ripon and Owen Falls, and below Foweira, where the river drops 400 ft. in a series of three rapids, known as the Murchison Falls, to the level of Lake Albert. The central situation of the Ripon Falls, in the midst of a cotton-growing country, suggests the possibility of a central supply of power for the plantations, and the nearness of the Murchison Falls to the

Kilo and Moto goldfields and other gold areas in this region makes them a possible source of power for mining purposes.

Other important reserves of hydro-electric power are the Russisi river, by means of which the waters of Lake Kivu drop 2,450 ft. to the level of Lake Tanganyika ; the numerous rapids on the Congo, particularly those between Stanley Pool and Matadi, and the Stanley Falls between Stanleyville and Ponthierville ; the rapids on the upper courses of the Niger and at Tossaye and Bussa, the falls and rapids on the Zambezi; and the rapid coastal rivers of South Africa generally. In the Katanga province of the Belgian Congo, the Falls of Mwandinguza, upon the Lufira river, and of Nzilo, upon the Lualaba river, are used for hydro-electric machinery which will enable the output of copper to be greatly increased. In the south of the continent the Victoria Falls on the Zambezi have a horse-power estimated from 300,000 to 600,000, according to the flow of the river at different seasons. This power is not yet used ; but it could probably be supplied throughout a great part of Rhodesia for the development of cotton and tobacco production, the movement of crops to the main lines of transport, farmstead operations, and the working of light railways. The electric transmission of power over long distances also makes it possible that the Witwatersrand mining area might be supplied from the same source.

234, *Sources of Power in South Africa.* At present energy for the Rand is generated at the power stations using coal mined near to the stations. With the exception of the Zambezi, there is no great source of hydro-electric power in Africa south of Lake Tanganyika ; although the Howick and Karkloof Falls on the Great Umgeni river, the Gordon Falls on the Umsindusi river, the Johnston Falls on the Luapula river, and the

Aughrabies Falls on the Orange river are possible sources of power. The last, with its plunge of over 400 ft., is, however, situated at a great distance from industrial and farming centres.



XXIX. Shelter Fall, Howiek

235. *Limited Supply of Water in South Africa.* With respect to the use of water for power in South Africa, and probably in other portions of the continent also, it is evident that as the supply is limited, the first call will be for purposes of irrigation. It is estimated that owing to the unequal distribution and limited area of

water-supply in the Union of South Africa, only about 3,000,000 acres are capable of irrigation. This is less than 1 per cent, of the total area of the Union, over four-fifths of which irrigation is essential for the development and prosperity of agriculture. In this part of Africa the possible sources of water-supply are practically confined to (1) the coastal strip of country between the Indian Ocean and the first high barrier of mountains known as the Zitzikama, Outeniqua, and Langebergen ; (2) the coastal belt east of the Keiskama river and the whole of Natal and Zululand; (3) the Orange and Vaal rivers ; and (4) the eastern Transvaal. On the Vaal river two great dams have been constructed near Vereeniging, for the supply of the mines of the Transvaal, and for agricultural and industrial purposes ; but comparatively little water is available for generating electricity.

In the upper courses of the Komati, in Mozambique ; at the Tolo Azime Falls on the Limpopo; on the portion of the Sabi river that is in Rhodesia ; on the Rufiji at Pangani Falls ; in the upper courses of the Tana river ; in the short and rapid coastal streams of Algeria ; and on certain West African rivers, such as the Dembia, in French Guinea, the Volta, and the Kulukpene, in Togoland, are other sources of power, the full use of which will no doubt be developed in time.

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