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of the “ Mediterranean ” and the “ Tropical ” floras which have accommodated themselves to the peculiar climatic conditions. The line of demarcation between the two floral areas, almost coinciding in the west with the Tropic of Cancer and in the east dipping south towards the meridian of Lake Chad, assigns by far the greater portion of the area to “ Mediterranean ” influences. Uniformity, in spite of differences of altitude and soil, is a general characteristic of the vegetation, which outside of the oases consists mainly of plants with a tufty, dry, stiff habit of growth. The oases are the special home of the date-palm, of which there are about 4,000,000 in the Algerian oases alone. In company with this tree, without which life in the Sahara would be practically impossible, arc grown apples, peaches, oranges, citrons, figs, grapes, pomegranates, &c. From December to March wheat, barley and other northern grain crops are successfully cultivated, and in the hotter season rice, dukhn, durra and other tropical products. Alto- gether the oasal flora has considerable variety; thirty-nine species are known from the Kufra group, forty-eight from the Aujila group. Zoologically the Sahara is also partly Mediterranean, partly

Tropical. Apart from the domestic animals (camels, asses, &c., and very noticeably a black breed of cattle in Adrar), the list of fifteen mammals comprises the jerboa, the fennek or fox, the jackal, the sand rat *(Psammomys obesus),* the hare, the wild ass and three species of antelope. In Borku, Air, &c., baboons, hyaenas and mountain sheep are not uncommon. Without counting migratory visitants, about eighty species of birds have been registered—the ostrich, the *Certhilauda deserti* or desert-lark (which often surprises the traveller with its song), *Emberiza Saharae,* three species of *Dromolea,* &c. Tortoises, lizards, chameleons, geckos, skinks, &c. of fifteen different species were collected by the single Rohlfs expedition of 1873-1874; the serpents comprise the horned viper, *Psammophis sibilans, Coelopeltis lacertina,* the python and several other species. The edible frog also occurs. *Cyprinodon dispar,* a fish not unlike *Cyprinodon calaritanus,* is found in all the brackish waters of north Sahara and swarms in the lake of the Sīwa oasis.

The chief centres of population in the Sahara are, firstly, the oases, which occupy positions where the underground water makes its way to the surface or is readily reached by boring; and, secondly, certain mountainous districts where the atmospheric moisture is condensed, and a moderate rainfall is the result. Except in the south of Algeria, where cultivation has been extended by means of artesian wells, the condition of the Sahara oases is far from prosperous. Prior to the French occupation, a feeling of insecurity had been engendered by the marauding habits of the nomad tribes; cultivation had become more restricted; and the decline of the caravan trade had brought ruin to certain centres, such as Murzuk. The most important are the oases of the Tuat region, especially Insalah; those of Ghat and Ghadames on the route from Tripoli to Zinder; and of Kufra, in eastern Sahara (see Tuat and Tripoli). The various confederations of the Tuareg, in the central Sahara, are grouped round hilly districts. The most important are the Αwellimiden, on the left bank of the Middle Niger; and the Kel-Ui, grouped around the mountainous districts of Air or Asben; the two northern confederations, those of the Ahaggar and Asjer, being less powerful. Much information respecting the Awellimiden confederation was obtained during the voyage down the Niger, in 1896, of Lieutenant Hourst of the French Navy, who was much struck with its powerful organization under the chief Madidu. North­west of Timbuktu in the district or “ Kingdom ” of Biru is the oasis and town of Walata, a Tuareg settlement. Other moun- tainous districts in which a certain amount of rain falls regularly, and which contain a population above the average for the Sahara, are Tibesti and Borku, in the east centre, and Adrar in the west. Tibesti and Borku are peopled by Tibbus; the western Adrar by Moors (Berbers). The northern portions of

the Sahara are inhabited by nomad Arabs.

Attempts have been made by many explorers and writers to trace in certain of the existing inhabitants the remnants of an aboriginal race of negro affinities, which inhabited the Sahara before the arrival of the Berbers and Arabs. E. F. Gautier, writing in 1908, maintained that the evidence available (for the central Sahara) rendered probable the hypothesis that at a period perhaps as recent as the Roman conquest of North Africa the Sahara was still neolithic and peopled by a race of agricultural negroes, who extended to the confines of Algeria. Negro influence is undoubtedly seen in various parts of the Sahara, but it may date from a much more

recent period than has been supposed. For example, the con­nexion between many of the place-names in Fezzan and the language of Bornu is attributable to the northward extension of the influence of the Bornu-Kanem empire between the 11th and 14th centuries a.d. The allusions by classical writers to Ethiopians as inhabitants of the Sahara prove little, in view of the very vague and general meaning attached to the word. The physical characteristics, and especially the dark colour, of many of the Saharan populations is apparently a stronger argument, but even this is capable of another explanation. Caravans of negro slaves from time immemorial passed northwards along the main desert routes, and it is just in the oases on these routes that the dark element in the population is chiefly found. It may there- fore be attributed to the intermarriage of the original lighter inhabitants of the oases with such slaves. The Tibbu *(q.v.)* or Tebu, once thought to be almost pure negroes, proved, when examined by Gustav Nachtigal in Tibesti, where they are found in greatest purity, to be a superior race with well-formed features and figures, of a light or dark bronze rather than black. Their language is related to that of the Kanuri in Bornu, but it appears that the Kanuri have derived theirs from the Tibbu, not the Tibbu from the Kanuri. Physically, the Tibbu appear to resemble somewhat the Tuareg, and there is little doubt that they are a Hamitic, not a negro, people.

The commerce of the Sahara is not inconsiderable. Among the more important trade routes are (1) from Morocco to Cairo by Insalah and Ghadames, which is followed by the pilgrims of western Africa bound for Mecca; this route has been largely superseded by the sea route from Tangier to Alexandria; (2) from Kuka (Lake Chad) to Murzuk and Tripoli;, (3) from Kano and Zinder to Tripoli by Air and Ghat; (4) from Timbuktu to Insalah, Ghadames and Tripoli; (5) from Timbuktu to Insalah and thence to Algeria and Tunisia; (6) from Timbuktu to Morocco. The Senussi movement brought into prominence the desert routes between Wadai in the south and Jalo and Benghazi in the north, which partially superseded some of the older routes. Other causes tended to reduce the importance of the old routes. The long-established route from Darfur to the Kharga and Dakhila oases fell into disuse on the closing of the eastern Sudan by the Mahdist troubles. The great route leading from Tripoli via Ghadames and Ghat, to Zinder, Kano, and other great centres of the Hausa States maintains its importance, but the opening of trade from the side of the Niger by the British in the early years of the 20th century affected its value. The route across the western Sahara to Timbuktu is less used than formerly owing to the establishment by the French of a route from Senegal via Nioro to the Upper Niger. The old route, however, retains some importance on account of the salt trade from the Sahara, which centres at Timbuktu. Salt and date palms are the chief products of the Sahara. The principal sources of the salt supply are the rock-salt deposits of the Juf (especially Taudeni), the lakes of Kufra and the rock salt and brine of Bilma (*q.v.*).

The hope of an eventual commercial exploitation of the Sahara rests mainly on the possible existence of mineral wealth. To supply easy communication between Algeria and Nigeria the construction of a railway across the desert has found many advocates. Two principal routes have been suggested, the one taking an easterly line from Biskra through Wargla to Air (Agades) and Zinder—generally, the route followed by Foureau (see below) ; the other starting from the terminus of the most westerly railway already existing, and reaching Timbuktu via Igli and the Tuat oases. A third suggested route is one from Igli to the Senegal, still farther west.

Reference may also be made to the proposal, strenuously advocated between 1870 and 1885, to open up the region to the south of Algeria and Tunisia by the construction of an inland sea.

According to Colonel François Roudaire (1836-1885), the author of this scheme, deceptively styled the “ flooding of the Sahara,” it was possible to create an inland sea with an average depth of 78 ft. and an area of 3100 sq. m., or about fourteen times the size of the Lake of Geneva. A French government commission decided that the excavation of the necessary canal would not be difficult, and that in spite of silting-up processes the canal when cut would at least last 1000 to 1500 years. Ferdinand de Lesseps, Roudaire’s principal supporter, visited the district in 1883 and reported that the canal would cost five years’ labour and 150,000,000 francs. The scheme (which fell into abeyance on the