

VEGETATION.

TYPES OF VEGETATION.

Although the Republic is a tropical country it includes only a few small areas where the vegetation presents the aspect of an impenetrable tropical rain forest, the aspect that is so commonly visualized by one thinking of a tropical region. Differences in rainfall, soil, and altitude cause the vegetation to change constantly within remarkably short distances. The indigenous flora is very rich in species and has been little studied. The observations recorded here are intended only to give an impression of the general features of the vegetation, of the relation of the vegetation to the geology and the climate, and of the possible value of the forests. Most of the area of the Republic is covered by two contrasted types of vegetation—the mesophytic type, which is developed where rainfall is normal or abundant and which includes most of the forests, and the xerophytic or desert type which prevails in areas of slight rainfall. There are in addition small but significant areas of halophytic and of shoreline vegetation.

FORESTS.

OCCURRENCE AND GENERAL APPEARANCE.

The forests of the Republic are generally, though not uniformly, confined to the mountainous areas. As the northeast slopes of the mountain ranges receive much more rainfall than the southwest slopes, they are more heavily wooded and bear forests at much lower altitudes. Everywhere, however, the forest growth becomes thinner and more stunted toward the base of the mountains. The forests visible from the sea are therefore generally rather scrubby in appearance and do not give a fair impression of the country as a whole. Probably none of the forests anywhere fairly represents the beauty and the extent of those that existed before the discovery of the island. During the days of the French colony large areas were cleared to make room for plantations of coffee, cacao, and other crops, and such clearing, frequently assisted by fire, has been continued to some extent ever since. Valuable wood in accessible localities has been exploited commercially during and since colonial days. Finally, the cutting of firewood and the burning of charcoal, the only natural fuels available, cause a continued and enormous wastage. It is therefore not surprising that virgin forests, if they occur at all, are found only in the most remote and inaccessible localities.

KINDS OF TREES.

The writers are familiar with the names of only a few of the more common and conspicuous trees. The native oak (*bois de chêne*), the *tavernon*, and the *sandbox tree* (*sablier*) are among the larger and more handsome forest trees. The *silk cotton tree* (*arbre à coton*) reaches a

large size. Large areas in the Southern Peninsula contain a tree that resembles the American walnut. Most of the forests at moderately high altitudes contain large trees of the West Indian cedar (acajou senti). Pines are found on some of the mountain tops and under exceptional conditions on the plains. The royal palm (palmier royal), with its great green head surmounting a clean slender trunk from 10 to 18 meters high, is one of the most graceful trees of the Republic. It grows at moderate or low altitudes where the soil retains moisture fairly well. Fan palms (palmiers à éventail) are confined to low altitudes, usually on calcareous soils. Both the base of the fronds of palms (tache) and the fronds are used as roofing material. The coconut palm (cocotier), which is very common at low altitudes, is generally a cultivated tree. The calabash tree (calebassier) bears on its trunk great green fruits resembling gourds, which are much used for water vessels and bowls. The largest tree in the Republic is the mapou, which at some places attains a diameter of nearly 3 meters. (See Pl. IV, A.) It grows singly at moderate or low altitudes where the climate and soil are not excessively dry. At many localities, especially where the rainfall is not excessive, leguminous trees and shrubs are numerous. The coral bean tree (bois immortel) is used to make living fences. The trumpet tree (bois trompette) is grown as an ornamental tree around houses, especially in the Southern Peninsula.

Many of the native fruit trees are common in the forests. Among them are the alligator pear (avocatier), sour sop (corossolier), sapote (sapotillier), mammee tree (abricotier), sweet sop (pomme cannelle or cachiman cannelle), custard apple (cachiman crème and cachiman coeur-de-boeuf), star apple (caimitier), and the native cherry (cerisier). Several fruit trees from other tropical countries have also spread over the island and many of them grow wild in the forests. Among them are the orange (orange), lime (citron), grape-fruit (shaddock), bread-fruit (arbre-à-pain), mulberry (murier), guava (goyavier), and mango (manguier). The mango grows singly or in clusters spaced at ample intervals. Its wide, rounded tops bear an impenetrable canopy of dark-green leaves, making it one of the best and most handsome shade trees of the country.

The Republic contains valuable cabinet woods, especially mahogany (acajou), but the supply of mahogany has now been so greatly depleted that only a small production from isolated and more or less carefully guarded trees is possible. Some mahogany is used locally and some is exported. Other valuable cabinet woods are the manchineel (mancencillier), satinwood, rose wood (bois rose), cinnamon wood (bois cannelle), yellow acoma (acoma jaune), a kind of ebony (ébène), and gris-gris. *Lignum vitae* (gayac), a very hard wood that is in special demand for making tools and parts of machines, is exported in large quantities when trade conditions are favorable. Dyewoods, especially logwood (campêche), have been exported on a large scale. Logwood is not indigenous but was intro-



A. MAPOU TREE IN MEMÉ VALLEY NEAR
TERRE-NEUVE.



B. XEROPHYTIC VEGETATION IN THE ARTIBONITE PLAIN SOUTHEAST
OF GRANDE-SALINE.

Principally cactus and bayahonde.

duced in colonial days and has spread rapidly over the Republic, where it grows best in dry, calcareous soils. Brazil wood (brésillet), fustic (fustet), and sassafras are other dyewoods.

ASSOCIATED VEGETATION.

Associated with the forest trees at high altitudes (above 1,000 meters) there are many ferns (fougères), tree ferns (fougères arborescentes), and a great variety of underbrush. The tree ferns and begonias are especially characteristic of areas of volcanic rocks at high altitudes. At lower altitudes bamboo (bambous) and heliconias (bananier marron) are found in moist ground along streams. Bamboo grows in dense clusters to a height of 20 meters and a diameter of 10 or 15 centimeters. The hollow stalks are cut in lengths of about 2 meters, the ends are plugged up, and the hollow pipe thus made is used for carrying water. Bamboo has been introduced from the orient, but there are several similar indigenous plants. The trees at all altitudes contain a large number of epiphytic bromeliads and orchids. A great variety of lianas (lianes) festoon the trees at all altitudes. Some of the striking lianas are the barrel liana (liane à barrique), which is used in making barrel hoops, the water liana (liane-à-l'eau), which yields potable water, the snuffbox sea bean (liane coeur-de-St. Thomas), and ox-eye sea bean (liane à cacone or yeux de bourrique). The seeds of the snuffbox sea bean and ox-eye bean are the most common West Indian seeds that are carried by the Gulf Stream to the shores of northeastern Europe.

Low down on the mountain slopes the forests are replaced by xerophytic plants and grasses. On the northeastern slope of the Massif du Nord and in the northwestern part of the Southern Peninsula trees and shrubs that are elsewhere found at high altitudes extend down to unusually low altitudes.

NOTES ON LOCAL AREAS.

The uncultivated land in the Massif du Nord is generally rather heavily forested on the crest and well down on the northeastern slope. The southwestern slope, facing the Central Plain, and the lowlands of Gonaïves are invaded by xerophytic vegetation. The crest of the limestone ridge northeast of the Central Plain is covered with thick, scrubby forest, but north of Cerca-la-Source the vegetation changes abruptly to an open pine forest with short brown grass and little underbrush except in ravines. This vegetation gives way to dense forests with much underbrush and no pines along the crest of the divide between Lamielle and Mont Organisé, perhaps owing to a difference in precipitation, as there is no apparent difference in soil. In the vicinity of Mont Organisé, however, there is open pine forest, and scattered pines extend down into the edge of the North Plain at an altitude of 100 meters above sea level, the lowest alti-

tude at which they were seen anywhere. Here they are confined to ravines. Pines are common as far to the west as Dondon, but in all this region they are confined to areas of igneous or metamorphic rock. The valleys of Grande Rivière du Nord, Dondon, and those to the west contain magnificent sandbox (sablier) and mapou trees, most of them in waste corners and along fence rows, for the land is cultivated.

Only the summits of ranges and some of the mountain valleys in the Northwest Peninsula are much forested. The tavernon, mapou, and mango are conspicuous trees in the valleys. There is a small stand of particularly large trees in the valley west of Terre-Neuve. Pines grow only on the crest of a range just north of the Sources Chaudes. The other trees are said to include many valuable species. Mahogany appears to be restricted mainly to the lower mountain slopes. There are many isolated trees in the Commune of Gros-Morne but they could not be extensively exploited. The Bombardopolis Plateau contains large areas of very dense forest, apparently new growth, and a great deal of lignum vitae (gayac), which, however, is kept down by constant cutting, for it is the chief article of export at Môle St.-Nicholas.

The limestone ridges of the Montagnes Noires are generally thickly timbered, but large and perfect trees are confined to small areas. At places forests extend into the Central Plain. The trough at the foot of the mountains on the southwest and south margins of the plain supports a heavy forest, as does also the depression southeast of Rivière Canot, just northwest of Maïssade. A peculiar feature of the Central Plain is the occurrence of pines along certain ridges about its edge and in the interior between Maïssade and Pignon. These ridges mark the outcrop of folded beds of coarse sandy rock that appears to furnish a soil especially suited to the pines.

The sides of the Chaîne des Mateux bear only scrubby brush, and most of its crest is a grassy or bushy savanna. Guavas are thick and attain almost the dignity of trees. Northeast of Couyau and elsewhere there are considerable areas that have a thin stand of pines, which grow in tall guinea grass. Farther southeast the conditions are much the same, and there is little forest. Grands-Bois, or Cornillon, gets its name from the forests which once existed there. Moreau de Saint-Méry states that the forests were cut down in colonial days to make room for coffee.¹ Several years ago pines and other trees from this region were cut into lumber at a sawmill at Gloire, on the northern shore of Étang Saumâtre, but the mill has burned down. There is now only a thin stand of pines in this region. The pines of the Chaîne des Mateux and Grands-Bois grow on limestone, and are virtually confined to altitudes of 1,000 meters or more above sea level.

¹ Op. cit., vol. 2, pp. 294 et seq.

The higher uncultivated parts of the Massif de la Selle are generally forested. The lower slopes contain merely brush. Along the Dominican border, south of Fond-Verrettes (also called Mission), scattered pines grow on a limestone terrane from an altitude of about 1,000 meters up to 1,400 meters above sea level, where they give way to a dense tropical rain forest. Above 1,600 meters, however, an open pine forest in a thick stand is found again. This pine forest extends up to the very peak of Mont La Selle. On the south slope, from 1,500 meters down to 1,000 meters, the belt of the tropical rain forest is strongly developed and grades into xerophytic vegetation lower down, near the south coast. Similar conditions are found at corresponding altitudes farther west. Near Furcy there is a large area of depleted pine forest, some of it on limestone but most of it on basaltic rock. The summit of the divide between Jacmel and Port-au-Prince, at an altitude of about 1,300 meters above sea level, supports a dense tropical rain forest. The limestone lower down on the north side of the mountains contains many trees but no real forest.

The mountains of the Massif de la Hotte, particularly the Montagnes de la Hotte and their northern slopes, in some places even down to the coast, bear heavy forests that probably contain valuable species. The vicinity of Baradères Bay was one of the most famous lumbering regions of colonial days, but the virgin forests of the present day are confined to the interior, and roads would have to be made to exploit them. There are practicable routes up the valleys of the Grande Rivière de Jérémie, the Rivière de Tiburon, the Rivière des Baradères and the Grande Rivière de Nippes. The route up the Grande Rivière de Nippes would tap the rich agricultural land of the Asile Valley. This area probably offers the best opportunity for the development of the lumber resources of the Republic, and it is at least worthy of a survey by a qualified forester.

Gonave Island contains no extensive forests. Large isolated mahogany trees are found in the interior of the island. All the upland is covered with thick shrubbery except areas that were cleared and have grown up in guinea grass. The inclosed lowland called the Plaine des Mapoux gets its name from some large mapou trees.

The forests of Tortue Island were famous in colonial days and were then extensively exploited. Moreau de Saint-Méry states that nearly all the valuable species of the colony grew there, among them mahogany, gayac, and bois-marie or dame-marie.¹ At present the eastern end of the island is partly cleared, and large areas in it are abandoned to guinea grass. The western third and most of the northern slope are forested. During a brief visit to the region near Vallée our party saw some gris-gris but no mahogany. A few years ago a Belgian company attempted to exploit the timber on this island by building a narrow-gauge railway northward from Vallée. The grade was established, a little track was laid, and

¹ Op. cit., vol. 1, p. 740.

two locomotives were installed, but they are now idle, and no timber appears ever to have been cut by the company.

Logwood has been exploited with more success in recent years than any other forest product. At Grande-Rivière du Nord a plant for the extraction of dye liquids was operated for several years. It burned down but has now been replaced. This plant is supplied mainly from groves of logwood on the north side of the Central Plain near St.-Raphaël and Pignon. At Port-de-Paix a remarkable aerial tramway has been constructed to convey logwood a distance of about 18 kilometers from Bassin-Bleu to the coast. The supply is drawn from the slopes of the valley of Les Trois Rivières but is said to be very much depleted. Good groves of logwood were seen in the valley of the Artibonite southeast of La Chapelle. There is much logwood along the south coast, and it is exported in considerable quantity from Miragoâne.

Figures showing the export value of different forest products are given under the heading "Commerce" (p. 79).

XEROPHYTIC VEGETATION.

EXTENT AND GENERAL FEATURES.

The xerophytic vegetation of the Republic is typical of its plains, particularly the arid plains in the lee of the mountain ranges, such as the Cul-de-Sac, Artibonite, and Arbre plains. The vegetation at some places on these plains is of an extremely arid type. The xerophytes usually extend some distance up the mountain slopes, especially the southwestward-facing slopes, where they even approach the crests of high ranges, as at Ennery. They include innumerable spiny plants, among which cacti are prominent and at some places dominant. The general aspect of these arid plains is sterile and forbidding, and their great extent, particularly over the more accessible parts of the Republic, is unpleasantly surprising to travelers who see the country for the first time.

KINDS OF PLANTS.

The cacti are the dominant plants in extremely arid regions. There are numerous kinds of cacti, many of which seem to be similar to species found on the mainland of North America. Arborescent forms are wonderfully developed and some of them attain a height of 6 or 10 meters and have trunks more than 30 centimeters in diameter. Cacti are especially typical of the northwestern part of the Cul-de-Sac Plain, the lower Artibonite Plain, and the vicinity of the Arbre Plain (Pl. IV, B). Certain kinds of cacti, particularly opuntias (raquettes), are widespread and are not confined to the typically arid regions. Columnar cereus is used for hedges at many localities outside the zones of xerophytic vegetation. Opuntias, associated with pine forests, are reported from Mont la Selle, the highest peak in the Republic.



A. BAYAHONDE THICKET IN THE CUL-DE-SAC PLAIN NEAR PONT BEUDET.



B. THICKET OF *CERCIDIUM PRAECOX* (A PALO VERDE) ABOUT 5 KILOMETERS NORTHEAST OF GONAÎVES ON THE TRAIL TO TERRE-NEUVE.

Cacti are not by any means the only plants of the xerophytic regions. Where the soil is fertile and retains moisture well large areas of the plain are forested with a thick tangle of bayahonde, a scrubby leguminous tree resembling the American mesquite (Pl. V, A). This wood is hard and takes a good polish. The trunks of some of these trees reach a diameter of 0.6 meter, but they are knotty and gnarled. The bayahonde is used a great deal for fuel, some of it as charcoal. It is interesting to note that a small palo verde, a tree that has not been previously reported from the Republic, was found on the desert plain north of Gonaïves, on the trail to Terre-Neuve. Mr. Paul C. Standley, of the United States National Museum, reports that it is probably *Cercidium praecox*, the Mexican species. (See Pl. V, B.) Acacias, yuccas, and agaves, of different kinds, as well as palmettos, grow on the mountain slopes. Many palmettos rise somewhat above the other trees and are spaced at intervals so regular that they give the landscape the aspect of a weird orchard. Palmettos are characteristic of transition zones between the xerophytic and mesophytic vegetation. Certain species furnish material for baskets, and the aloes furnish fibers for rope, two articles that are manufactured and used locally in great quantities. Many of the trees and shrubs in the xerophytic zones are covered with masses of *Tillandsia* and other bromeliads, as well as with other epiphytic plants. Agaves are at many places used as hedges.

SAVANNAS.

Grassy savannas are numerous and at places extensive. Some of them, particularly those on the plains, are natural prairies; others, especially those in the mountains, occupy land that was cleared for agriculture and abandoned. Most of the cleared areas are covered with guinea grass, but the natural savannas are covered with native grasses. The grass in the more humid areas is often 0.5 to 1 meter tall, but throughout most of the year it is rather dry and brown, especially on the natural savannas. Where stock raising is feasible it is often eaten down.

The savannas of the plains are most extensive on the North Plain and the Central Plain. On the North Plain there is a belt of savanna 4 or 5 kilometers wide at the base of the mountains from Les Perches to Ouana-minthe. The savanna is very flat except where it is dissected by narrow, steep-sided ravines. In the ravines there is a healthy forest growth, including pines, but elsewhere there is scarcely anything but grass. At its northern border the savanna grades into a lowland covered with xerophytic shrubs, probably because rainfall is less abundant at this distance from the mountains.

The northwest part of the Central Plain is a flat, grassy savanna, in which there are a few ravines that contain a growth of shrubs and small trees which causes them to stand out as sinuous green lines in the general expanse of brown grass. Southeast of this large savanna the plain is more

dissected and consequently more wooded. The interstream areas are grassy, but are invaded by a shrub resembling greasewood. In this region there are a few areas of pine and other forest trees. (See p. 60.)

Smaller savannas of this general type are seen in the Artibonite Valley near Mirebalais and farther down the valley, as well as in the upper part of the Cayes Plain.

Savannas of a second type, which occupy areas once forested, are found in the Massif du Nord, particularly in the Chaîne des Mateux and its connected ranges to the east. They are found also in the Massif de la Selle, and on Tortue and Gonave islands. They generally occupy fairly flat or rolling uplands, not the steep and rugged mountain sides. The grassy savannas are associated with a thin stand of pines. (See pp. 59-60.)

A third type of savanna is found in areas of volcanic rock, particularly in the southern two-thirds of the Republic. These areas, especially the areas of basalt, where the rainfall is not very great, are covered with short brown grass (Pl. VI, A) and present a strong contrast to the adjacent areas of limestone, which are densely wooded, although all the forests do not contain large trees. Contrasts of this kind are very common throughout the Southern Peninsula and near Saut d'Eau, on the north slope of the Chaîne des Mateux.

A similar contrast may be observed between areas of the rather impervious chalky limestone and areas of the more massive and porous limestone. The areas of chalky limestone support only low shrubs and flowering plants and a growth of short grass resembling that of the areas of volcanic rock. The areas of massive limestone are forested or are covered with tall guinea grass. This contrast was noted at places on the mountains north of Ennery, on Gonave Island, and on the south slope of the Southern Peninsula, in the region between Jacmel and Côtes-de-Fer, where the chalky limestones are extensively exposed.

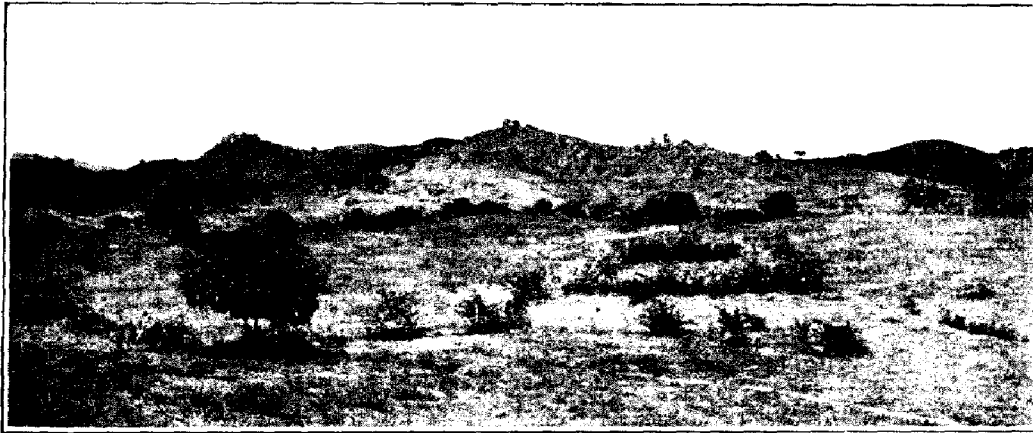
HALOPHYTIC VEGETATION.

On the lower Artibonite Plain, where the soil is poorly drained and very alkaline, there is an extensive area of halophytic vegetation, in which a variety of salt bush is particularly abundant. (See Pl. VI, B.)

There are regions of similar vegetation near the sea at the west end of the Cul-de-Sac Plain and at the outer edge of many other smaller coastal plains. Plate VI, C, shows the halophytic vegetation on a mud flat behind a lagoon and mangrove thicket on the north coast of Gonave Island west of Étroit. In all these areas the halophytes are replaced by xerophytes farther back from the shore.

VEGETATION OF THE SHORE LINE.

Extensive mangrove thickets are conspicuous along the shore line of the low coastal plains, especially in the North, Artibonite, and Cul-de-Sac

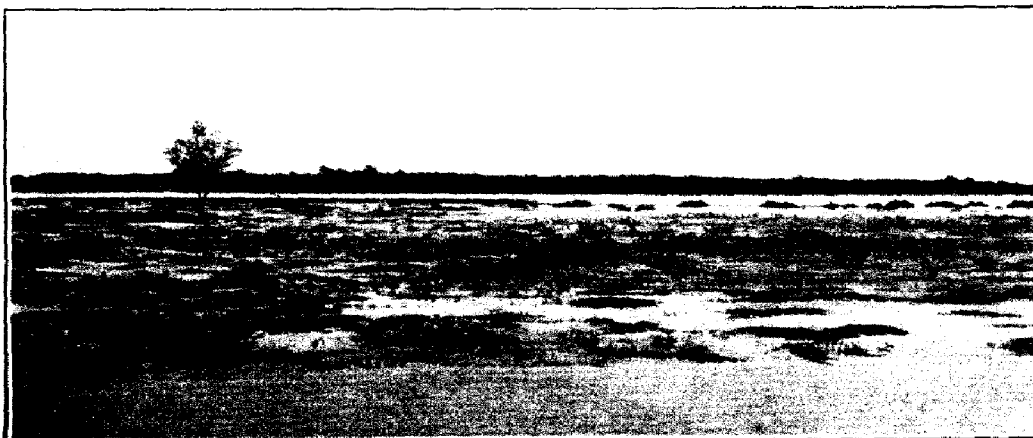


A. SAVANE LA CIDRA, ABOUT 10 KILOMETERS SOUTHWEST OF
ST. MICHEL DE L'ATALAYE.

In some parts of the Republic grass-covered savannas are characteristic of areas
floored with volcanic rocks.



B. SALT BUSH IN THE ARTIBONTE PLAIN NEAR GRANDE-SALINE.
Characteristic of alkaline soil.



C. HALOPHYTIC VEGETATION ON THE NORTH COAST OF GONAVE
ISLAND WEST OF ETROIT.

In the background, between the sea and a lagoon, is a mangrove thicket.