

geology and is more fully discussed in Part II. The soils of the Republic may be classified briefly as alluvial soils, soils residual from limestone, and soils residual from igneous rock. The alluvial soils cover the surface of most of the larger plains and many similar but smaller valleys and plains. Although they constitute probably less than 30 per cent of the total area they support perhaps more than 50 per cent of its population. The greater productivity of these plains is due not entirely to the nature of their soil but in part to their smooth surface and their superior accessibility.

The limestone that covers so large a part of the Republic yields on weathering a red clayey soil which is very fertile and which for some crops is superior to the alluvial soils. Areas in which the surface is smooth enough to permit the retention and cultivation of this soil are well cultivated and thickly settled. Many small bodies of such land are scattered through the mountains, especially on the summits of the ranges. Examples are the Bombardopolis Plateau, the crest of the Chaîne des Mateux, the mountains of Dame-Marie and Jérémie, and the interior plateaus of Gonave Island.

The soils derived from igneous rocks are generally thin and poor and support only a scanty population. Some of the granitoid rocks of the north-eastern part of the Republic, such as those at Vallière and the volcanic rocks of Plaisance and Terre-Neuve are an exception to the rule. These rocks yield a fairly deep and fertile soil, which with sufficient rainfall is highly productive, and the areas so favored are well settled.

## AGRICULTURE.

### GENERAL FEATURES.

Agriculture has been the basic and dominant industry under both the colony and the Republic. About 80 per cent of the people (see p. 67) live in the rural districts and get their living from the soil. In this description the leading agricultural and live-stock products are divided into two distinct classes—those grown for export and those grown for local consumption. The first class includes coffee, cotton, cacao, sugar, honey, and hides and skins. The second class includes live stock and a great number of grains, vegetables, and fruits. As any discussion of the present state of agriculture inevitably leads to comparisons with that in the French colony, which was in its day the most productive and prosperous region in the New World, a brief review of the state of agriculture in colonial times is given with the description of its present state. Most of the information regarding colonial agriculture other than statistics of exports is taken from the work of Moreau de Saint-Méry, to which reference will be made by volume and page wherever direct credit seems to be necessary.

## CHIEF EXPORT CROPS OF THE COLONY AND OF THE REPUBLIC.

## TOBACCO AND INDIGO.

Tobacco and indigo, two crops that are no longer of great value, occupied a prominent place among the colonial exports. Tobacco, the crop first grown, was cultivated by the buccaneers on Tortue Island.<sup>1</sup> It was the leading crop until the cultivation of indigo was begun. According to Moreau de Saint-Méry,<sup>2</sup> the colony owed its first real prosperity to indigo. Although wild indigo (indigo marron) grows in the Republic, the introduced variety (indigo franc) seems to have been preferred wherever it would grow. In certain soils, however, only the wild indigo would thrive. In the early part of the eighteenth century indigo was the leading export crop, but later it yielded its rank in turn to sugar, coffee, and cotton, and at the end of the colonial period it occupied the fourth place. It was still the leading crop in a few areas, such as Jean Rabel and parts of the Artibonite Plain, where the land was too low, hot, and dry for coffee and could not be irrigated to raise sugar cane. The quantity of indigo and the leading ports from which it was exported in 1791 are shown in the table on page 78. More than a third of the total was produced in St.-Marc, although Cap-Haïtien, Port-au-Prince, and Les Cayes exported considerable quantities. Probably this supply was drawn from a much larger area than that immediately around the smaller ports, which owing to their commanding situations, were the principal ports of major divisions of the colony. One of the chief disadvantages of the culture of indigo seems to have been that it impoverished the soil rapidly and ceased to flourish. Its cultivation has been abandoned since colonial days, and the general use of synthetic indigo will probably prevent any considerable revival. Tobacco culture was dead at the end of the colonial days, and although the plant seems to succeed well, all later attempts to revive its cultivation have been short-lived, and the Republic now imports nearly all the tobacco it consumes.

## SUGAR.

Sugar cane was introduced into Spanish Santo Domingo soon after the island was discovered, but it appears to have been first cultivated in the French colony on the Léogane Plain in 1680.<sup>3</sup> It proved to be the most lucrative crop of the colony, and its cultivation spread rapidly to all areas where the conditions were at all favorable for it. The most famous plantations of the colony were in the North Plain, especially near Limonade and Quartier Morin and in the near-by valley of Limbé. Water

<sup>1</sup> Labat, *Voyage du Père Labat aux Isles de l'Amérique*, vol. 5, pp. 63-64, La Haye, 1724.

<sup>2</sup> *Idem*, vol. 1, p. 24.

<sup>3</sup> *Idem*, vol. 2, p. 450.

power was used extensively to turn the cane mills, but irrigation seems to have been relatively little practiced, as the natural rainfall generally sufficed to produce good crops. In the west and south, however, on the Artibonite Plain, Cul-de-Sac Plain, and even the Cayes Plain, irrigation generally was imperative. It was for the extension of sugar culture in these areas that the French built the remarkable systems of irrigation works that still form the basis of the irrigation that is now practiced in the Republic. These works are more fully described in Part V.

The necessity for thorough tilling and preparation of the land and generally for irrigation also, as well as for a high temperature, has always restricted the raising of sugar cane to the alluvial plains and valleys, where the land is fairly smooth and free from stones. It was on the four larger plains—North Plain, Cul-de-Sac Plain, Léogane Plain and Artibonite Plain—that the great bulk of colonial sugar was raised, and it is on these and the Central Plain that any large modern sugar industry must be developed. Nevertheless the industry in colonial days extended to nearly every small alluvial plain or narrow valley where the conditions were favorable or could be adapted to the growth of sugar cane. On the Léogane Plain long-continued cropping is said to have depleted the soil so much that fertilization was necessary.<sup>1</sup>

Sugar refining was highly developed in colonial days, and nearly half the quantity exported in 1791 was refined. The table on page 78 shows that the value of the sugar exported was more than 50 per cent of the value of total exports in 1791. Political as well as geographical conditions made Port-au-Prince, Cap-Haïtien, and Les Cayes the leading ports. Normally Cap-Haïtien probably surpassed Port-au-Prince, but its exports in 1791 were greatly curtailed by revolutionary disturbances.

Sugar cane has always been grown to supply the domestic demand. Unrefined brown sugar (*rapadou*), is an article of food, and raw sugar cane is highly prized. A considerable quantity of sugar cane is used in making liquors, particularly rum. Plate VII, A shows a small cane mill of the type that is common throughout the Republic. Since 1915 an effort has been made to develop the sugar industry on a large scale, and an American company has established a big plant at Port-au-Prince and laid out extensive plantations on the Cul-de-Sac Plain. The sugar exported in 1921 and 1922 (see table, p. 79) was principally the output of this company.

#### COFFEE.

Coffee was introduced from Martinique by the Jesuits<sup>2</sup> and was first grown successfully at Dondon, where the first establishment for its preparation was installed in 1738. Its culture spread with amazing rapidity,

<sup>1</sup> Moreau de Saint-Méry, *op. cit.*, vol. 2, p. 450.

<sup>2</sup> *Idem*, vol. 1, p. 164.

for it was found to be especially adapted to the mountainous regions, where sugar cane could not be raised and where indigo had given only desultory success. Forests were cut down everywhere and coffee plantations took their place. They were still being extended rapidly at the time of the Revolution. It was estimated in 1908 that the total area of coffee plantations in the Republic was more than 500 square kilometers.<sup>1</sup>

Coffee is grown successfully between latitudes 25° N. and 25° S. It thrives best between 300 and 1,500 meters above sea level, although under exceptional conditions it is grown commercially at lower altitudes. In the neighboring island of Porto Rico the best coffee is said to grow on soils derived from igneous rocks,<sup>2</sup> but although soils derived from igneous rocks produce excellent coffee in the Republic of Haiti they are probably no better adapted to its cultivation than some of the ocherous soils derived from limestone. Deep soil is necessary, for the plant has a long vertical tap root, but loose stones are not objectionable if the soil does not dry out too rapidly. Excellent plantations are found on steep and stony slopes. A fairly heavy rainfall is necessary, but some dry weather also is required. Deep, well-drained soils that support a good growth of natural forest are generally suitable for coffee. Some shade is required, and several kinds of forest trees are used to obtain it.<sup>3</sup>

Coffee generally grows better on north slopes, mainly, no doubt, because they receive more rain but partly, perhaps, because they are sheltered from the excessive heat of the sun. Nearly all the north slope of the Massif du Nord produced excellent coffee in colonial days, that of Le Borgne being especially famous. Coffee was the chief crop of the Montagnes Noires, of Grands-Bois, and of practically all the mountainous area of the Southern Peninsula. The coffee of Grands-Bois was perhaps the most famous in the colony.<sup>4</sup>

Coffee is cultivated now in much the same way that it was formerly. The plant grows virtually wild at many places. The chief producing areas are about the same as those of the colony. The coffee of St.-Marc is particularly esteemed in the French market. Plaisance and Petit-Goave are well-known producing areas.

The value of the coffee exported in 1791 constituted about one-fourth of the total value of the exports. In recent years the value of coffee has constituted about two-thirds of the total value of exports. The quantity exported annually varies greatly, as is shown by the following table:

<sup>1</sup> Internat. Bur. Am. Republics Bull., Dec., 1908, p. 1095.

<sup>2</sup> McClelland, T. B., Indicações acerca de la siembra de café en Puerto Rico, Estación Experimental Agrícola de Puerto Rico circ. No. 15, Mayagüez, Oct., 1914.

<sup>3</sup> Fauchère, A., Culture pratique du caféier et préparation du café, p. 28, Paris, 1908.

<sup>4</sup> Moreau de Saint-Méry, op. cit., vol. 2, p. 293.

*Pounds of coffee exported annually in 1901-1905, 1909, and 1910.<sup>1</sup>*

1901	56,372,192	1905	38,306,055
1902	64,950,274	1909	41,634,470
1903	51,446,193	1910	79,023,168
1904	81,617,568		

The Report of the Receiver of Customs for 1920 truly says that "coffee is the principal crop of Haiti, the staple on which her people in the main depend for existence, and the export tax thereon is the largest single source of revenue to the state."

## COTTON.

Cotton is indigenous to the West Indies, and in the island of Haiti it grows as a perennial shrub, attaining a height of 3 to 5 meters. It grows wild but when desired for market is generally cultivated in a crude way. It thrives best if replanted every few years. The native plant seems to have supplied practically all the cotton exported by both the colony and the Republic. Moreau de Saint-Méry<sup>2</sup> records an attempt to introduce, at St.-Louis du Sud, an improved variety, which however, does not appear to have become extensively cultivated. The cotton plant requires some rain in the early period of its growth but will endure much drought later. It appears to grow best on calcareous soils and at low altitudes. It is the leading crop of certain lowland areas, such as the Arbre Plain, parts of the Artibonite Plain, and Cul-de-Sac Plain, where irrigation is impracticable and the climate is too hot and dry for coffee. In colonial days it was exported chiefly from St.-Marc and Port-au-Prince. (See table, p. 78.)

Cotton is now generally cultivated in about the same way and to the same extent as in colonial days. The quantity exported varies greatly, as the price fluctuates, depending upon the quantity picked rather than upon the quantity grown, which usually exceeds that marketed. When prices are high cotton is marketed in great quantities, but when prices are low it may nearly disappear from the market. An American company recently attempted to introduce cotton-growing on a large scale in the Central Plain. An improved American cotton was introduced, but it failed to mature properly during the first season, and further experiments have been checked temporarily by a great drop in price. Cotton raising, however, appears to offer much promise of success when its details have been thoroughly worked out. Similar difficulties were encountered and surmounted in introducing the cultivation of sea-island cotton into the British West Indies.<sup>3</sup>

<sup>1</sup> Figures from *Rapports de la Chambre des Comptes*, in *Le Moniteur*. For 1901-2 see No. 27, p. 205, 1905; for 1903 see No. 42, p. 327, 1905; for 1904-5 see combined No. 16 and 17, p. 101, 1910; and for 1909-10 see No. 84, p. 243, 1912.

<sup>2</sup> *Op. cit.*, vol. 2, p. 648.

<sup>3</sup> See publications of Imperial Dept. Agriculture for the West Indies.

## CACAO.

The cacao tree is another indigenous plant. Its value was recognized early in colonial days, but it never attained the importance of coffee. It ranked fifth, however, in the order of value of colonial exports in 1791, or sixth if syrup, a by-product of the sugar industry, is considered. The principal area of production in colonial days, as now, was the west end of the Southern Peninsula, in the communes of Dame-Marie and Jérémie. Here cacao in great measure takes the place of coffee, growing in large forests or orchards on the gentler slopes of the limestone mountains. Early in the colonial period St.-Michel de Fonds-des-Nègres was famous for its cacao.

Cacao grows between latitudes of 20° N. and 20° S., and thrives best at altitudes less than 800 meters above sea level, in deep, well-watered, but well-drained soil. It requires close shade and thorough protection from strong winds. Banana trees, rubber trees, bois immortelle, and other trees are used for shade and windbreaks. More rain is required for cacao than for coffee. These exacting conditions therefore restrict the range of the cacao tree considerably more than that of the coffee tree.<sup>1</sup>

## HONEY.

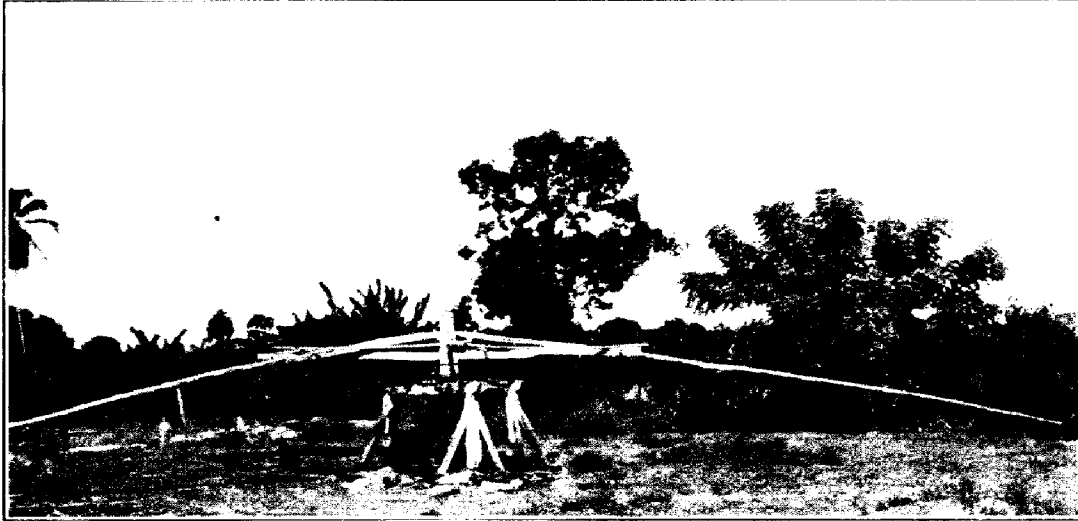
Although honey is only a minor export, it appears regularly among the list of exports of the Republic. Bee culture was introduced in colonial days but does not seem to have attained much success. Now, however, it is a recognized industry, probably capable of considerable extension. Haitian honey is of excellent quality and probably could with little effort obtain a wider market.

## CROPS GROWN FOR DOMESTIC CONSUMPTION.

Many grains, vegetables, and fruits, both cultivated and wild, form a part of the dietary of the people but seldom find their way outside the country. The principal grains are corn (maïs), petit-mil, and rice (riz). Corn is cultivated successfully on the gentler mountain slopes up to altitudes of 900 to 1,200 meters where there is enough moisture. Also, although the climate is rather too hot, much of it is raised in some of the lowlands, especially the Artibonite Plain. The ears are small but good, the commonest corn being yellow. Most of the crop is ground into meal and used for food, although a little is fed to stock. The high prices offered in 1917, 1918, and 1919 caused the export of a considerable quantity, most of which went to Cuba,<sup>2</sup> but its export is very unusual. Ears of corn in the

<sup>1</sup> See article "Cacao" in *International Bur. Am. Republics Bull.*, Sept., 1908, English section, pp. 471-482.

<sup>2</sup> See report of Consul John B. Terres of Port-au-Prince, in *Supplement to Commerce Reports*, Bureau of Foreign and Domestic Commerce, Washington, November 9, 1918.



A. SMALL MILL FOR CRUSHING SUGAR CANE.



B. METHOD OF DRYING CORN.

husk tied together and hung up in great bunches on trees or poles for protection from animals form a conspicuous feature of the corn-raising areas. (See Pl. VII, B.)

Petit-mil is one of the nonsaccharine sorghums, probably a variety of durra. It is raised extensively on the valleys and plains. The grain is used for food and the fodder is fed to stock. Considerable rice is raised locally, and more is imported to supply the great demand for the national dish—rice and beans. Beans and peas of several varieties are raised for domestic consumption. The Congo pea (pois congo) from Africa is one of the most esteemed varieties.

A very important food plant is manioc, commonly called cassava, from the roots of which cassava bread is made. In some localities it is the staple food. Yams and sweet potatoes (patate) are among the most widely cultivated and used vegetables. Of the fruits, perhaps the commonest are the plantain (banan), banana (figue banan), orange (orange), alligator pear (avocat), mango (mango), pineapple (anana), and coconut (coco). The plantain, picked green and cooked, forms a staple like bread at many places. Many less common fruits are highly prized in season, such as the grapefruit (shaddock), breadfruit (arbre-à-pain), grape (raisin), mulberry (mûre), cherry (cerise), apricot (abricot), corrosol, cayemite, and sapotille. Fruits of temperate climates can be raised on some of the high mountains. Blackberries (mures sauvages) and strawberries (fraises) grow at Furcy.

Nearly all these fruits and vegetables are raised in small gardens on little individual plots of land. They are characteristic of the mountains rather than of the plains, which are more often devoted to cotton, sugar cane, grains, and grass. Some localities are known throughout the Republic for the excellence of certain fruits or vegetables that they produce, and the local trade in these commodities is a rather large industry. No attempt has been made to standardize products, such as fruits, and raise a marketable article of uniformly superior quality. This neglect appears to be most unfortunate, for the country can produce oranges, bananas, pineapples, and other fruits that could compete successfully in any market with fruit raised elsewhere, and the geographical location of Haiti is more favorable than that of several fruit-growing countries of tropical America.

#### LIVE STOCK AND POULTRY.

The live stock of the Republic includes mainly horses, mules, donkeys, cattle, goats, sheep, and hogs, all originally imported from Europe. They are raised entirely for local use, except that their hides and skins are exported. Stock raising is the principal industry in areas where the soil and climate are unsuited for intensive agriculture. The savannas of the North Plain, Central Plain, Artibonite Valley and Cayes Plain, and of certain mountain lands are devoted mainly to raising horses and cattle.

The horses, which are small but hardy, are used for riding and to a small extent for driving. Mules are used for riding and for packing heavy loads, as they are stronger and tougher than the horses. Donkeys, however, are the real burden bearers; nearly all the produce that is carried over the mountain trails is borne by them. Cattle are raised chiefly for meat and hides, rarely for milk. Oxen are used for drawing loads in the plains.

Short-haired goats of many colors are perhaps the commonest domestic animals. They are valued chiefly for their meat and skins, although they also yield most of the milk produced in the country. They are especially adapted to browsing rugged mountain sides that are unfit for cultivation and inaccessible to other pasture animals. Sheep are raised in only a few places. The wool is not of very good quality. Hogs are nearly as common as goats. They forage everywhere, living on seeds of trees and on fruits, vegetation, and waste. They are of a lean, rangy type, but their meat is highly esteemed.

Chickens, turkeys, and guineas are the commonest fowls and are raised nearly everywhere, both for eggs and meat. Wild guineas and wild pigeons are common at some places, particularly in the Central Plain.

All the domestic animals and the poultry could be greatly improved by careful breeding and selection.

#### METHODS OF FARMING AND FUTURE OF AGRICULTURE.

As has already been intimated, the methods of farming are rather crude, nearly all the work being done by hand. Doubtless much of it must always be performed in this way, for much of the land is rough and stony and is divided into small plots. On the plains, however, traction plowing and cultivation has been introduced successfully in recent years and can be greatly extended. Any great increase in the production of export crops is inextricably bound up with the problem of conserving and distributing water for irrigation. (See Part V.) Much can be done also, however, by improving and standardizing farm products and fruits and by perfecting methods of marketing. These improvements are greatly to be desired, for agriculture is and undoubtedly must continue to be the country's mainstay and support.

#### COMMERCE.

##### GENERAL FEATURES.

Foreign commerce has remained much the same under the Republic as it was in colonial days. The raw products of the plantation and forest constitute the great bulk of the exports; manufactured goods, particularly textiles and prepared foodstuffs, comprise the greater part of the imports. The value of the exports has generally exceeded that of the imports. These features are brought out in the following table, which gives the