

## PART I. GEOGRAPHY.

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### PHYSICAL GEOGRAPHY.

#### GENERAL RELATIONS.

The most striking thing in the morphology of the West Indies is the arrangement of its geographic features in arcs. Most of the arcs are convex northward, but in Haiti and in islands farther east some of them are convex southward. These arcs, which are seen in the trend of the islands, of the mountain ranges on the islands, and of the ridges and troughs in the submerged areas, are shown in Figure 1, a map based on one recently published by Professor Taber,<sup>1</sup> to whom we are indebted for its use.

The island of Haiti, the largest of the West Indian islands except Cuba, is between Cuba and Porto Rico. It lies between parallels  $17^{\circ} 39'$  and  $20^{\circ}$  north latitude, and meridians  $68^{\circ} 20'$  and  $74^{\circ} 30'$  west of Greenwich. The Atlantic Ocean borders it on the north and the Caribbean Sea on the south. It is separated from Cuba by the Windward Passage and from Porto Rico by the Mona Passage. The submerged platform in the Mona Passage is relatively shallow, the maximum depth of water in the central part being but 260 fathoms (475 meters). The Bartlett Deep, the most remarkable of the deep troughs of the West Indies, extends into the Windward Passage, where the floor of the sea plunges southwestward from a depth of 893 fathoms (1,633 meters) to 1,737 fathoms (3,177 meters). A submerged ridge extends westward from the southern peninsula of the Republic of Haiti beyond the eastern end of a similar ridge that extends westward from Jamaica. These two ridges are separated by a trough having a maximum depth of 1,573 fathoms (2,877 meters). Between the island of Haiti and the Bahama Banks is an unnamed trough having a maximum depth of 2,388 fathoms (4,367 meters). South of the island lies the deep basin of the Caribbean Sea.

The Republic of Haiti occupies approximately the western third of the island and the Dominican Republic the eastern two-thirds. The maximum length of the Republic of Haiti is about 295 kilometers, and its width near the Dominican border is about 183 kilometers. The area of the

<sup>1</sup> Taber, Stephen, The great fault troughs of the Antilles: *Jour. Geology*, vol. 30, pp. 89-114, pl. 1, fig. 6, 1922.

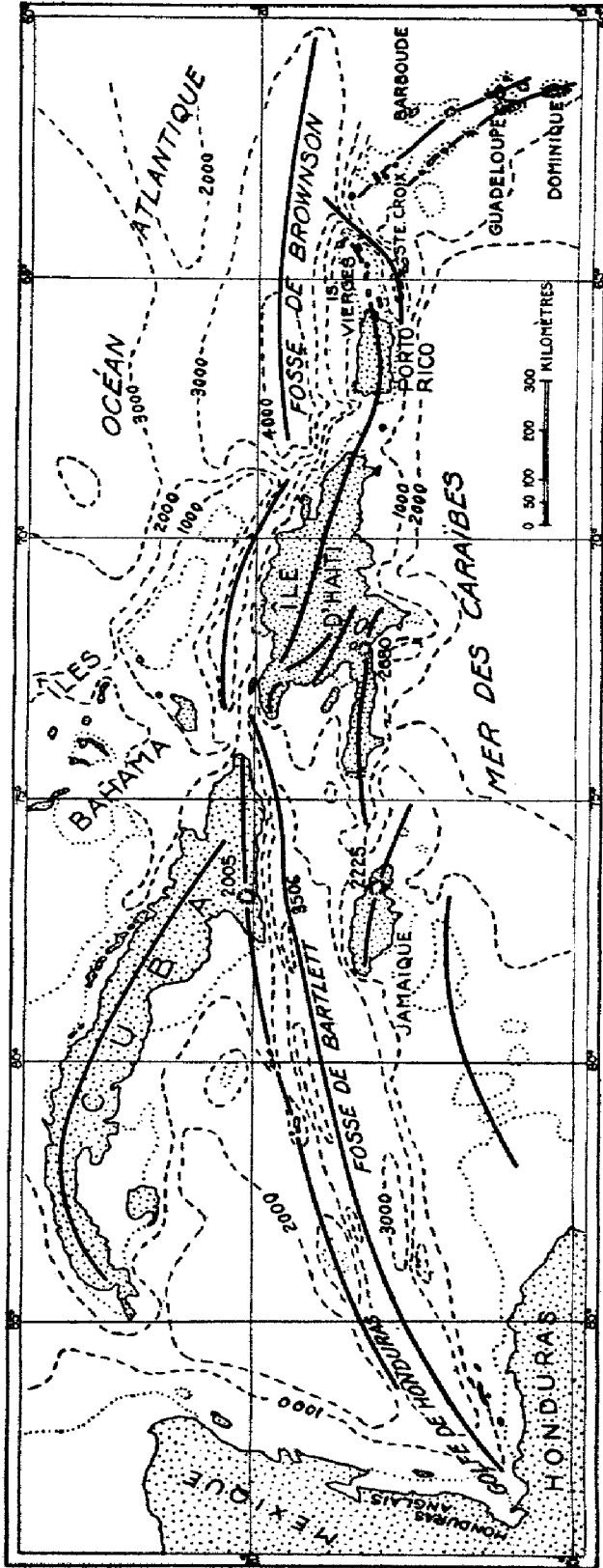


FIGURE 1.—Map showing trend of geographic features of the West Indies.

Base from Taber. Contour interval 1,000 fathoms (1,829 meters). Areas within dotted lines less than 100 fathoms (183 meters).

Republic, including Tortue Island, Gonave Island, Grande Cayemite, and Ile à Vache, is about 27,700 square kilometers, according to planimeter measurements of a map compiled by the Service des Levés Topographique. The precise area of the Republic is not known, as the boundary between the two Republics has not been definitely fixed. The two prominent westward-extending peninsulas, the northwest peninsula and the southern peninsula, embrace an extensive body of water in which lies Gonave Island.

#### SURFACE FEATURES.

##### GENERAL CHARACTER.

Haiti is very mountainous. Towering mountains are visible from the sea in front of any of the open ports of the Republic, and at many ports steep mountain slopes extend down to the coast. The traveler who is accustomed to wide plains can scarcely believe that a population so large as that of the Republic can live in a country so rugged, yet the exports from which the Republic largely derives its revenue consist principally of agricultural products. The ruggedness of the mountains is even more impressive to one who travels along the trails that extend into the heart of all the mountains. The mountain slopes at moderate altitudes yield immense crops of coffee, which forms the leading article of export. The mountain slopes at all altitudes are cultivated in small gardens, which yield the vegetables and fruits that are sold at innumerable market places, which form the most characteristic feature of the commercial and social life of the rural districts. Large areas of the plains that flank the mountains in some parts of the Republic are semiarid. The rural population is concentrated in the fertile mountain valleys and in the parts of the plains that through natural heavy rainfall or the application of water by irrigation yield sugar cane, cotton, and other crops.

Although a large part of the Republic is mountainous, extensive plains flank the mountains at some places along the coast or extend like wedges into the mountainous regions. Many of the mountains consist of beds of limestone, and steep slopes that are scarred by high cliffs form the most characteristic feature of these mountains. These cliffs appear to be abnormal features; they were probably not formed by the usual processes of subaerial erosion. They are confined almost entirely to regions where the limestone is massive, regardless of its age. The base of the cliffs is determined by the outcrop of strata of thin-bedded limestone or other kinds of rocks. The cliffs have apparently been formed by the undermining and subsequent stopping of blocks of massive limestone by ground water, which has penetrated the rock and percolated along the contact with the underlying beds. The contrast between the surface features produced by the erosion of massive and of thin-bedded limestone is clearly shown on the north and south slopes of Mont Pailboreau, the limestone range between

Ennery and Plaisance. The massive limestone on the north slope is scarred by cliffs that attain a height of several hundred meters. On the south slope, where the limestone is thin-bedded, the dissection is more intricate and there are no cliffs.

#### GEOGRAPHIC PROVINCES.

The following geographic provinces are recognized in this report. The boundaries between these provinces are shown approximately on Plate XXVII, page 354.

Tortue Island.	Montagnes du Trou d'Eau.
North Plain.	Chaîne des Mateux.
Massif du Nord.	Cul-de-Sac Plain.
Northwest Peninsula.	Massif de la Selle.
Central Plain.	Massif de la Hotte.
Montagnes Noires.	Gonave Island.
Artibonite Plain and Valley.	

As the topographic features of these provinces are determined by the physical and structural features of their surface rocks and by their geologic history they are fully described in Part III, which follows the text describing the stratigraphic and structural geology and the geologic history. The surface features are briefly summarized here in order to furnish the geographic setting for the description of the geology.

Tortue Island is an imperfectly dissected plateau, the margins of which are modified by late emergence.

The North Plain extends along the north coast from Acul Bay eastward to the Dominican border. Between Acul Bay and Cap-Haïtien the plain is shut off from the sea by Morne du Cap, an outlier of the Massif du Nord.

The Massif du Nord, which is the northwestern prolongation of the Cordillera Central of the Dominican Republic, extends from the Dominican border northwestward to the deep trough of the valleys of Rivière la Quinte and Les Trois Rivières north of Gros-Morne. The Massif du Nord forms the western part of the arc that extends across the island. The entire massif is mountainous and very rugged.

The Northwest Peninsula embraces the entire peninsula west of the valleys of Rivière la Quinte and Les Trois Rivières. This region contains a variety of surface features, including mountains, lowlands, and an extensive plateau, as follows: Montagnes de Terre-Neuve, Montagnes du Nord-ouest, Arbre Plain, Jean Rabel Valley, Bombardopolis Plateau. The Montagnes du Nord-ouest and the Montagnes de Terre-Neuve form a short arc that is convex northward. The most striking features of the peninsula are the magnificent emerged terraces that border the outer margins of the Bombardopolis Plateau.

The Central Plain, which is the only extensive interior plain in the Republic, extends from the Dominican border northwestward to St.-

Michel de l'Atalaye as a wedge between the Massif du Nord and the Montagnes Noires. It is the northwestward prolongation of the San Juan Valley of the Dominican Republic.

The Montagnes Noires form a mountain system that is the northwestern prolongation of the northern part of the Sierra de Neiba of the Dominican Republic. At its northwest end it merges into the Massif du Nord forming a short arc that is convex southward.

The Artibonite Plain is a wedge extending southeastward between the Montagnes Noires and the Chaîne des Mateux together with the Montagnes du Trou d' Eau. The apex of the wedge is near the Dominican border, where the Montagnes Noires join the Montagnes du Trou d' Eau. The southeastern part of the Artibonite Plain, to which the name Artibonite Valley is applied, has a greater variety of surface features than the northwestern part—the plain proper. Morne Grammont is an isolated outlier of the Montagnes Noires in the plain southeast of Gonaïves.

The Chaîne des Mateux and its southeastward prolongation, the Montagnes du Trou d' Eau, extend southeastward from St.-Marc to the Dominican border as an arc that is convex southward and form the prolongation of the southern part of the Sierra de Neiba of the Dominican Republic.

The Cul-de-Sac Plain is part of a remarkable depression that extends across the island from Port-au-Prince Bay to Neiba Bay. The Dominican part of the depression is called the Hoya de Enriquillo. The plain is bounded on the north by the Montagnes du Trou d' Eau and on the south by the Massif de la Selle. It contains the largest inland body of water in the Republic, the Étang Saumâtre, which has no outlet.

The Massif de la Selle, which is named from Mont la Selle, the highest peak in the Republic, is the northwestward prolongation of the Sierra de Bahoruco of the Dominican Republic. It extends westward to the gap in the mountains along a line between Jacmel and Grand-Goave and includes a large coastal plain, the Léogane plain.

The Massif de la Hotte embraces the entire southern peninsula west of a line between Jacmel and Grand-Goave, where it merges into the Massif de la Selle. This region includes a large coastal plain, the Cayes Plain, and several interior lowlands, the largest of which is the Asile Valley. The remainder of the region consists of rugged mountains. The Massif de la Selle and the Massif de la Hotte form an arc convex northward.

Gonave Island is the largest outlying island belonging to the Republic. The southeastern half of the island is more rugged and has a greater variety of surface features than the northwestern half.

## DRAINAGE.

### GENERAL FEATURES.

The Republic of Haiti has a great many small streams. Most of them have short courses, and many of them flow directly down steep mountain