

## PART III. GEOMORPHOLOGY.

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The term geomorphology as used in this report signifies a description of the surface features of the earth with regard to their origin. Each of the geographic provinces of the Republic of Haiti comprises an area in which the surface features have a certain uniformity, usually the result of a common geologic history. These provinces are listed on page 31 and their location is shown on Plate XXVII. They are here described in the order in which they are listed on page 31, beginning in the northern part of the Republic. Only the major surface features of each province are described. As it seems unnecessary to repeat a discussion of the major events in the geologic history of each province, the reader should keep constantly in mind the geologic history of Haiti as outlined on pages 350-353. The lithology and the structure of the surface rocks, which are the most potent agencies in determining the shape of the features, are described briefly for each province.

### TORTUE ISLAND.

#### GENERAL RELATIONS.

Tortue Island is 37 kilometers long and has a maximum width of 7 kilometers. It is separated from the mainland by a channel that is 15 kilometers wide at the west end of the island and 9 kilometers wide at its east end but that narrows to 7 kilometers off St.-Louis du Nord. The maximum recorded depth of the channel is 1,267 meters (693 fathoms) off the west end of the island. In the narrowest part of the channel the maximum recorded depth is 777 meters (425 fathoms).

The axis of the island trends N. 78° W., parallel to the trend of the main structural features of the Massif du Nord.

#### LAND FEATURES.

##### UPLAND FORMS.

Tortue Island is a plateau modified by erosion and at the margins further modified by the results of recent emergence. The interior is a rolling plateau, the crest of which has a mean altitude of about 300 meters above sea level, but low, rounded knobs rise 325 meters above sea level. The plateau slopes gently seaward, both to the north and to the south. On the crest of the plateau there are no well-defined drainage channels. Near the



coast the slope is steep and is scarred by ravines that have slightly dissected the plateau by headward erosion. All the coastal ravines are short except those at La Vallée, on the south coast, where several extend far back into the plateau, forming a huge, intricately dissected amphitheater bounded by limestone cliffs.

#### SHORE FEATURES.

The most striking shore features are emerged coastal terraces. These terraces are widest and best preserved at the extremities of the island, where the seaward slope is more gentle than on the flanks. Plate XXVIII, A, a view of the east end of the island as seen from the south, shows clearly the profile of two emerged terraces. Each of the terraces has a gentle seaward slope and each has an emerged sea cliff at its inner edge. The lower terrace is truncated at the shore line by a similar but steeper cliff. As this part of the island was seen only from a distance no measurements were taken, but at other localities visited the inner edge of the lower terrace stands about 15 meters above sea level. The altitude of the upper terrace is not known, but the vertical interval between its outer edge and the outer edge of the lower terrace is greater than that between the lower terrace and the shore line.

On the south coast the terraces have been obliterated by erosion except in sheltered regions. One kilometer west of Pointe des Oiseaux there is a narrow remnant of the lower terrace 50 to 80 meters wide. At the outer edge there is a perpendicular sea cliff 8 to 10 meters high. The steep slope at the inner edge of the terrace merges into the coastal slope of the plateau and is not clearly discernible as a sea cliff. The abrasion platform is composed of schistose limestone, which is covered with a thin veneer of soft conglomeratic coralliferous limestone.

The west end of the island and the north coast were seen only from a distance. Terrace profiles are visible at the west end, and according to the description of Moreau de St.-Méry<sup>1</sup> terraces are conspicuous features at some localities on the north coast.

Along almost its entire length the north coast is truncated by sea cliffs and is inaccessible. The south coast is not so precipitous. At La Vallée an alluvial apron extends westward along the coast, embracing a narrow mud flat fringed with mangrove thickets. East of La Vallée the coast is bordered by sea cliffs that truncate remnants of the lower terrace.

#### SUBLITTORAL FEATURES.

A very narrow sublittoral platform encircles the island. Its width on the north coast is not known, but on the south coast its maximum width, as limited by the 20-fathom line, is 2.6 kilometers. The mean depth of water on the platform is about 15 fathoms (27 meters). In Haiti such narrow, shallow platforms are, with certain exceptions, characteristic of

<sup>1</sup>Idem, vol. 1, pp. 739-740.

shore lines of emergence. The width of the emerged coastal terraces is comparable to the width of the sublittoral platform, and it is inferred that these terraces were planed off by wave erosion during periods of time comparable to the time that elapsed during the making of the sublittoral platform. The emerged terraces are of Quaternary age and are probably Pleistocene, as along the south coast they are strongly dissected and at some places entirely obliterated.

## NORTH PLAIN.

### EXTENT AND GENERAL FEATURES.

The name North Plain has been applied since the early colonial period to the plain that extends along the north coast of the Département du Nord from Acul Bay eastward to the Dominican border. Its length is about 65 kilometers and its width is 5 to 20 kilometers. Its eastward prolongation in the Dominican Republic, which extends from the international boundary and Manzanillo Bay southeastward to Samaná Bay, is called the Cibao Valley. The western part of the Cibao Valley, adjoining the North Plain, is called the Valley of Rio Yaque del Norte. Between Acul Bay and Cap-Haïtien Bay the North Plain is separated from the sea by a short, rugged mountain range called the Morne du Cap. Elsewhere the plain fronts the sea. The southern border of the plain is the steep and very irregular mountain front of the Massif du Nord. From an altitude of 50 to 150 meters above sea level, at the base of the mountains, the plain slopes gently northward to the sea.

### LAND FEATURES.

The North Plain comprises four divisions, each of which has distinct surface features: (1) an alluvial plain, which has little or no relief, adjacent to the shore line; (2) a dissected plain composed of gravels of Quaternary age; (3) low hills composed of bed-rock; (4) a rock platform of irregular width at the base of the mountains.

### UNDISSECTED ALLUVIAL PLAIN.

The seaward part of the North Plain is an undissected alluvial plain composed principally of deposits of Recent age, built by streams that flow northward in shallow trenches and that probably inundate large areas during floods. This part of the plain is widest along the Dominican border north of Ouanaminthe and narrows westward, terminating in the marshes on the right bank of Rivière Haut du Cap near Cap-Haïtien.

### DISSECTED PLAIN.

Back of the undissected plain, in the region east of the longitude of Fort-Liberté, lies a dissected plain composed principally of stream gravels of Quaternary, probably Pleistocene, age. This plain is a conspicuous