

shows a subaqueous profile off Pointe Limbé, west of the entrance to Acul Bay, based on chart No. 5251 of the Hydrographic Office, U. S. Navy. The plotted points represent depths recorded along and near the line of profile, which is drawn perpendicular to the contours. The narrow, shallow bank where the depth is less than 5 fathoms (9.1 meters) apparently is a reef, but the lower part of the abrupt slope between 5 fathoms and 18 fathoms (32.9 meters) may be part of a submerged terrace scarp. The wide platform extending seaward from the foot of this scarp slopes from 18 fathoms to 30 fathoms (45.7 meters). This platform seems to be slightly submerged, as in other parts of the Republic wave-cut platforms have a maximum depth of 20 fathoms (36.5 meters). (See Fig. 24, p. 377.) On the east side of the entrance to Acul Bay the submerged platform is obscured by the reefs that are growing on it. Detailed charts are not available for other parts of the coast having shore features characteristic of submergence.

Westward from Cap Rouge the shore line is clearly a shore line of emergence, and the emergence is progressively greater toward the end of the Northwest Peninsula. Figure 23, *B*, a subaqueous profile off Grand Pointe on the east side of Port-de-Paix harbor (Chart No. 5250) is a typical profile of a recently emerged shore line. The significance of these two contrasted types of shore line is considered elsewhere.

NORTHWEST PENINSULA.

EXTENT AND GENERAL FEATURES.

The Northwest Peninsula is a mountainous region resembling in many features the Massif du Nord, from which it is severed by the deep trough here called the Trois Rivières Valley. The name as used here denotes the entire region west of this trough. The length of the peninsula from east to west is about 75 kilometers, and its average width is 35 kilometers.

Several mountain ranges constitute the axis of the peninsula. In the southeastern part of the peninsula the ranges trend about N. 50° W. and attain altitudes slightly more than 1,000 meters above sea level in the communes of Terre-Neuve and Gros-Morne. In the main body of the peninsula the ranges trend approximately east and west and attain altitudes less than 700 meters above sea level. These ranges stand about halfway between the north and the south coast and are bordered on the north and south by lowlands that are only 200 or 300 meters above sea level. The west end of the peninsula is a broad plateau with terraced seaward borders that has a maximum altitude of 450 meters above sea level.

The diversity of surface features is partly due to the diversity of surface rocks. Virtually all the mountain ranges contain a basement of igneous rocks covered by a great thickness of limestone. Soft marls and sandstones extend around the mountains and overlap the rocks that com-

pose them. These detrital rocks are the surface rocks in the lowlands north and south of the central ranges. Coralliferous limestone of Quaternary age veneers the plateau and terraces at the western end of the peninsula.

LAND FEATURES.

SUBPROVINCES.

Although the geographic isolation of the Northwest Peninsula permits its separation as a distinct geographic province, the surface features of different parts of the peninsula are so different that it is divided into six subprovinces—Trois Rivières Valley, Montagnes de Terre-Neuve, Montagnes du Nord-ouest, Bombardopolis Plateau, Arbre Plain, and Jean Rabel Valley.

TROIS RIVIÈRES VALLEY.

The conspicuous trough that separates the Northwest Peninsula from the Massif du Nord is here called the Trois Rivières Valley. This trough trends about N. 15° W. along an almost straight line from a locality between Gonaïves and Les Poteaux northward to the mouth of Les Trois Rivières near Port-de-Paix. Les Trois Rivières flows only in the northern part of the trough northward from Gros-Morne, but the trough is prolonged southward from Gros-Morne along the low divide between Les Trois Rivières and Rivière la Quinte and along the valley of Rivière la Quinte to the locality where it enters the Gonaïves Plain. This trough is apparently limited by faults on parts of both the east and the west side.

The valley of Rivière la Quinte has little relief. Along the road from Gonaïves to Gros-Morne the divide between Rivière la Quinte and Les Trois Rivières has an altitude of 270 meters above sea level. The flood plain of Les Trois Rivières northward from Gros-Morne is narrow, and the river swings in great loops against high bluffs. The lowland on both sides of the flood plain is strongly dissected and contains low, rounded hills and higher, narrower strike ridges. A conspicuous strike ridge on the east side of the valley, about 20 kilometers north of Gros-Morne, reaches an altitude of 560 meters above sea level. These hills and ridges are dwarfed by the lofty mountains behind them, in the western part of the Massif du Nord. North of Gros-Morne the mountains west of the valley are not so high.

MONTAGNES DE TERRE-NEUVE.

The Montagnes de Terre-Neuve extend northwestward from Gonaïves for a distance of about 30 kilometers and comprise several distinct ranges that trend about N. 50° W. The crests of the ranges have an average altitude of 700 meters above sea level, but the altitude of some of the peaks exceeds 1,000 meters. Between the mountain ranges are deep valleys, most of which are V-shaped and some of which resemble canyons. The

slope from the mountains southwestward to the sea and to the southeastern part of the Arbre Plain is very steep, and the slope northeastward to the lowland valley of Rivière la Quinte is almost equally steep.

Most of the mountain crests are rounded and fairly smooth, but the slopes are steep and rough, and are at many places scarred by cliffs, which at some localities, as along the valley of Rivière Colombier west of Terre-Neuve, reach heights of more than 100 meters. The mountains consist of a complex anticline, the axis of which coincides with the axis of the mountain system. The limestone that caps many of the mountains is tilted on the flanks of the folds, thus producing dip slopes and steep escarpments that face toward the crests of the anticlinal folds. Cliffs are common on the escarpments, but are not confined to them, for even on dip slopes erosion in the limestone produces narrow gorges bounded by cliffs. Sink holes are conspicuous features on the more level mountain summits. Some especially large sink holes have a flat floor of alluvium. Such sinks are conspicuous in Section Darane, along the trail from Gonaïves to Terre-Neuve.

Some of the mountains near Terre-Neuve have no cap of limestone and owe their surface features to the erosion of volcanic rocks. The slopes generally are less broken and less precipitous than those in limestone, but the surface is more dissected, and level uplands and smooth slopes are less common. The divides are rounded but narrow. As the volcanic rocks comprise rocks of different hardness, some of the slopes are broken by cliffs, but cliffs are particularly common along contacts between the volcanic rocks and limestone.

There are no large streams in the Montagnes de Terre-Neuve. Rivière Colombier is a small stream that is intermittent, even in its upper course, and disappears completely long before it reaches the Arbre Plain. All the streams have steep gradients and cascades are common. About 3 kilometers southeast of Terre-Neuve a small stream tumbles over a stairlike cascade probably more than 30 meters high. There are other cascades along Rivière Colombier and in Memé Valley along the upper course of Rivière Bassin.

MONTAGNES DU NORD-OUEST.

The Montagnes du Nord-ouest comprise three distinct ranges, which extend northwestward from the northwestern end of the Montagnes de Terre-Neuve to the central part of the peninsula and thence westward to the eastern edge of the Bombardopolis Plateau. On some maps these mountains are called the Montagnes de St.-Nicolas, on the assumption that they extend westward between Bombardopolis and Môle St.-Nicolas to the end of the peninsula, but as the mountains nowhere approach Môle St.-Nicolas the name is inappropriate. The westernmost range is situated south of Jean Rabel and may be called the Montagnes de Jean Rabel. No common or appropriate names are known for the other ranges. The

Montagnes de Jean Rabel were visited during the reconnaissance, but the other two ranges were seen only from a distance.

The three ranges collectively are arranged along an arc that is convex northward, but they are more or less *en échelon* and all of them trend north of west. The easternmost range parallels the strike of the older rocks farther south, but the trend of the middle and westernmost ranges swings more to the west, although the strike of the older rocks in the westernmost range is north-northwest.

The easternmost and highest of the three ranges rises abruptly from the northeast border of the Arbre Plain. To the southeast a deep, narrow valley imperfectly separates this range from the Montagnes de Terre-Neuve, and the surface features of the two regions seem to be quite similar. Much of the range appears to consist of limestone and is characterized by steep slopes and high precipices.

The middle range is the lowest of the three. It is in the middle of the peninsula between the Arbre Plain and the Jean Rabel Valley and is almost if not entirely separated from the range to the east by a deep gap extending northeastward from the Arbre Plain. This range appears to be less rugged than either of the other two and lacks the prominent cliffs and escarpments that characterize them. It probably contains less limestone and more igneous rocks.

The westernmost range, or Montagnes de Jean Rabel, rises 850 meters above sea level. Seen from the Arbre Plain, to the southeast, the crest appears to be a great square block with a comparatively flat top and nearly perpendicular white cliffs on the sides, surmounting a dissected pyramidal base of gentler slope. Undoubtedly the range is crowned by a thick cap of limestone, which rests upon a mass of igneous rocks. The lower and less rugged foothills consist in part of the igneous rock that underlies the limestone and partly of the soft marls that overlie the limestone. The interior of the range is deeply dissected, and the underlying igneous rocks are exposed in the valleys. The bottoms of the valleys generally are V-shaped, but the upper slopes in the limestone are at many places scarred by high cliffs.

BOMBARDOPOLIS PLATEAU.

GENERAL FEATURES.

The Bombardopolis Plateau, named for the principal and only important town in this region, is a high and relatively flat upland that embraces most of the Northwest Peninsula west of the longitude of Jean Rabel and Baie de Henne. To the east it is bounded by the Jean Rabel Valley, the Montagnes de Jean Rabel, and the Arbre Plain. A long, narrow valley that extends northwestward from Baie de Henne separates the plateau proper from the genetically similar ridge that extends southeastward to Port-à-Piment, bordering the west side of the Arbre Plain.

The width of the plateau proper is 15 or 20 kilometers from east to west, and its length is about 26 kilometers from north to south.

The most striking feature of this region is the remarkable series of well-preserved emerged coastal terraces that extend from the surface of the plateau down to the shore line like gigantic stairs.

Coralliferous limestone of Quaternary age covers almost the entire plateau, and the successively lower terraces are veneered with similar but progressively younger coralliferous limestone. The coralliferous limestone on the plateau clearly veneers an abrasion platform that has been planed by wave erosion from a terrane consisting of folded chalky limestone, cherty limestone, and sandy limestone containing boulders and subangular fragments of volcanic rocks. These older rocks are exposed on the outer edge of the plateau along the trail between Baie de Henne and Bombardopolis. The Chaîne des Desforges, a low mountain range along the outer edge of the plateau southwest of Bombardopolis, probably is composed of these older rocks. Volcanic rocks crop out on the lower slopes of the outer edge of the plateau at Le Plateforme. This region was not seen during the reconnaissance, but has been described by Lütgens,¹ who interpreted this area of volcanic rocks as half of the crater of a volcano that was active during late Tertiary and Quaternary time. The evidence is unconvincing, and it seems more likely that the basaltic volcanic rocks are older than the Eocene limestone.

The surface of the plateau, which rises to an altitude of 400 to 450 meters above sea level, is flat or gently rolling and is imperfectly dissected. The average relief does not exceed 20 or 30 meters. The few valleys generally are narrow and steep-sided. The lack of surface streams in large areas seems to be due to underground drainage in the limestone. Many of the small valleys are of the sink-hole type. Their trend is north-northwestward or northward, apparently conforming to the trend of the underlying Eocene limestone, which, at least along the trail from Baie de Henne to Bombardopolis, strikes in the same direction. Near the eastern margin of the plateau along this trail there is a remarkable series of small parallel valleys that drain northward into the valley extending northwestward from Baie de Henne. Cherty limestone and sandy limestone, probably of Eocene age, are exposed in the bottom of these valleys. The following four strike readings were taken in the bottoms of four valleys, each of which trends parallel to the strike of the older rocks in a distance of 3 kilometers from east to west: North-south, N. 15° W., north-south, N. 30° W. The suggestion seems reasonable that the strike of the older limestone has controlled the direction of the circulation of underground water in the younger limestone, first producing subterranean streams of a corresponding trend, which by caving and enlarging have been opened to the surface. This kind of erosion, but in an earlier

¹ Lütgens, Rudolf, *Geographische und geologische Beobachtungen in Nordwest-Haiti*: Geog. Gesell. in Hamburg Mitt., Band 82, pp. 72-75, 1919.

stage, is probably exhibited in the interrupted sink-hole valleys farther west, on the main plateau.

The Bombardopolis Plateau embraces two large valleys that indicate features of an inherited structure. One of these is the deep, narrow valley that extends northwestward from Baie de Henne. At its bottom is a narrow alluvial plain. The other is the valley of Rivière du Môle (also called Rivière la Gorge), which extends northward from the interior of the plateau to Môle St.-Nicolas. This valley is very narrow and has precipitous walls that are at some places fully 200 meters high. Along both sides of the valley of Baie de Henne there are well-preserved emerged sea terraces that extend up to the summit of the plateau. The valley of Rivière du Môle has distinct terraces above the 200-meter level. These coastal terraces along the valley walls indicate that the present valleys occupy depressions older than the coralliferous limestone. The valleys are therefore emerged bays, along which drainage lines have been developed.

EMERGED COASTAL TERRACES.

Emerged coastal terraces are the most striking features of the seaward slope of the Bombardopolis Plateau. The terraces along the north coast extend eastward beyond the boundary of the peninsula; those along the south coast end at Port-à-Piment. The following table shows the altitude in meters above sea level at the outer and inner edge and the approximate maximum width in meters of five distinct terraces on the east slope of the ridge between Petit Paradis and Baie de Henne. The altitudes given are based on the reading of an aneroid barometer and are therefore only approximate. Plate XVII, A (p. 246) shows the sea cliff between the fourth and fifth terraces.

Altitude and width, in meters, of terraces on east side of ridge between Petit Paradis and Baie de Henne.

No. of terrace.	Altitude at outer edge.	Altitude at inner edge.	Maximum width.
1	5	15	200
2	30	40	100
3	55	60	100
4	70	80	200
5	95	..	500+

On the west side of the same ridge, the side descending toward Baie de Henne, the terraces are narrower and more eroded. The following terraces were recognized and are designated by the number of the terrace in the preceding table with which they seem to agree in altitude.

Altitudes of terraces on west side of ridge between Petit Paradis and Baie de Henne.

No. of terrace.	Mean altitude.
1	29
2 (?)	47
3	55
4	70-75

Along the trail that ascends the margin of the plateau from Baie de Henne to Bombardopolis the lower terraces are dissected and are difficult to distinguish, but there are at least 20 recognizable terraces between the alluvial plain of Baie de Henne, which has an altitude of 10 meters above sea level, and a conspicuous terrace that has a mean altitude of 195 meters above sea level. The approximate mean altitude of the conspicuous terraces above and including the 195-meter terrace are shown in the following table. Most of these readings were obtained on flat-topped ridges between the northward draining valleys described on p. 370.

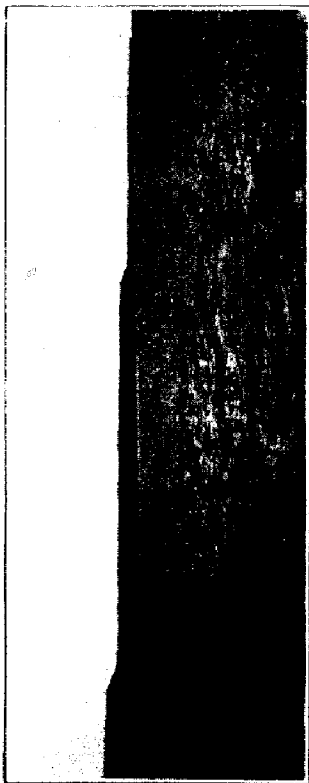
Altitudes and features of terrace between Baie de Henne and Bombardopolis.

Altitude.	Feature.
195	Conspicuous terrace.
225	Terrace.
280	Ridge.
335	Ridge.
360	Ridge.
370	Ridge.
380	Two adjacent parallel ridges.
412-430	Top of plateau.

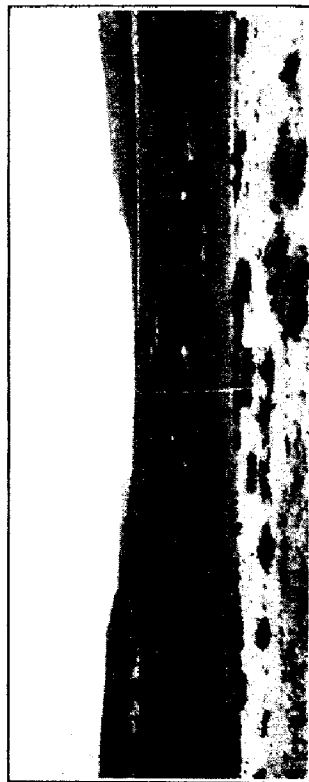
The following table shows the approximate mean altitude of prominent terraces above and including a 200-meter terrace along the trail between Bombardopolis and Môle St.-Nicolas.

Altitude and width of terraces between Bombardopolis and Môle St.-Nicolas.

Mean altitude in meters.	Width in kilometers.
200	
235	
260-275	1
285	1
325	
345	0.5
360	0.5
400	1

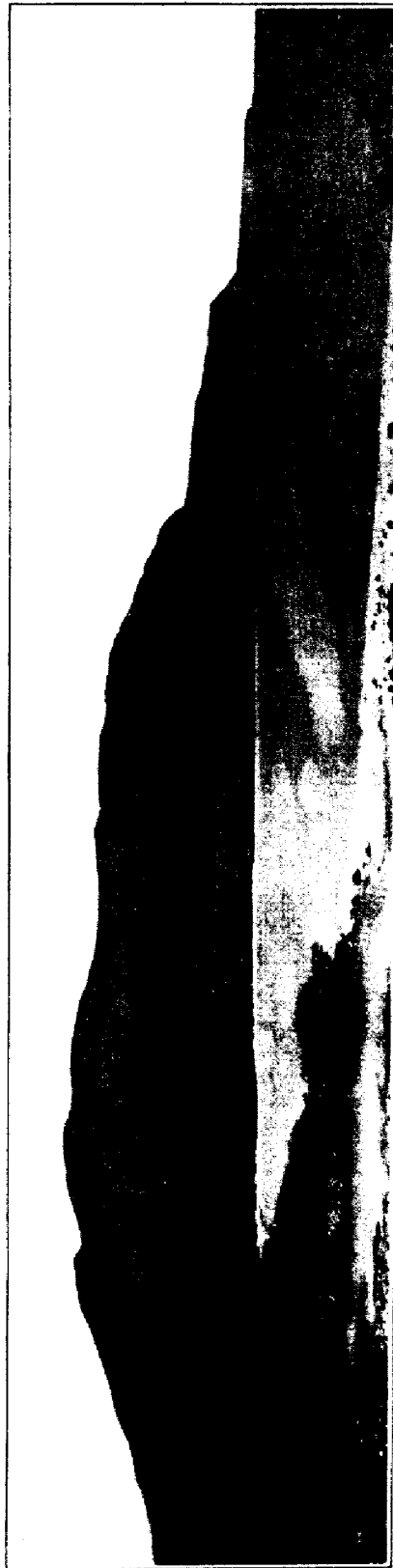


J. EAST END OF TORTUE ISLAND AS SEEN FROM THE CHANNEL TO THE SOUTH.



B. NORTHEAST END OF MÔLE ST.-NICOLAS BAY.

The surface of the isthmus in the center of the view is part of the lowest emerged terrace.



C. CAP ST.-NICOLAS,
EMERGED COASTAL TERRACES.

The preceding table embraces only the upper half of the total vertical interval that is characterized by emerged terraces, as below the 200-meter terrace the trail lies in the bottom of the deep gorge of Rivière du Môle, and the altitude of the lower terraces could not be determined.

The emerged terraces are very prominent along the coast at Môle St.-Nicolas, which has the best harbor in the Republic. The lowest terrace is bordered at the shore line by a sea cliff similar to the emerged sea cliffs at the front and rear of the higher terraces. The peninsula on the north side of the bay is a remarkably flat table-land, corresponding to a terrace that has an altitude of about 45 meters above sea level. In addition to this terrace there are two other conspicuous terraces on the peninsula, one 30 meters above sea level and the other 10 meters above sea level. The bay of Môle St.-Nicolas owes its existence to the emergence of the narrow flat isthmus that ties the peninsula to the mainland. The surface of the isthmus coincides with the lowest terrace and was a narrow channel before its emergence. Heavy storms from the north probably drive a little water across the isthmus even at the present time. The strong trade winds that blow through this gap have developed perfect dunes on a miniature scale near the north coast of the isthmus. Calcareous sand derived from the coralliferous limestone is heaped up in low dune ridges on the surface above the sea cliff.

Plate XXVIII, *B*, a view looking toward the head of the bay from the beach in front of the town, shows the low, narrow isthmus and the terraces on both sides. Plate XXVIII, *C*, a view looking southwestward toward Cap St.-Nicolas from the mouth of Rivière du Môle, shows some of the terraces on Cap St.-Nicolas and on the west side of the valley of Rivière du Môle.

The coast between Môle St.-Nicolas and Baie de Henne was not seen during the reconnaissance, but the emerged terraces are probably as striking at many localities as they are at those two towns. Near La Plateforme the material that forms the terraces has apparently been stripped from the plateau slope, revealing the volcanic rocks and the overlying impure limestone, in which the highest abrasion platform was cut, although La Plateform itself is a table-land capped by coralliferous limestone and apparently forms part of one of the lower terraces.

Southeastward from Baie de Henne to Port-à-Piment the emerged terraces become progressively less numerous and less conspicuous. Between Baie de Henne and Pointe du Petit-Paradis the lowest terrace at many localities is merely an emerged beach less than 5 meters above sea level and generally covered with sand, although the underlying coralliferous limestone is usually exposed in a low cliff at the shore line. At Petit-Paradis a tidal inlet nearly 10 meters deep, entrenched in the youngest coralliferous limestone, is said to connect the sea with an extensive inland lagoon. An emerged beach that has a width of 50 to 150 meters and an altitude of 5 to 8 meters above sea level extends along the coast between Petit-Paradis and Anse Rouge.

The emerged terraces completely disappear at Port-à-Piment, at the end of the terraced ridge separating the northwestern part of the Arbre Plain from the sea. This ridge gradually tapers and its height decreases southeastward from Petit-Paradis.

Along the north coast the emerged terraces extend to and beyond Port-de-Paix. Between Môle St.-Nicolas and Jean Rabel at least six well-preserved terraces rise at increasing intervals to an altitude of perhaps more than 300 meters above sea level. The mean altitude of the lowest terrace is about 10 meters above sea level, of the second 35 to 40, of the third 60. The higher main terraces are separated by greater intervals, but there are many obscure intermediate terraces separated by intervals of no greater magnitude than those between the lower terraces.

The description given shows that emerged coastal terraces become progressively more numerous and reach a progressively greater altitude westward along both the north and south coasts of the Northwest Peninsula. In the Bombardopolis Plateau they reach an altitude of 400 to 450 meters above sea level. The total number of terraces is not known and probably would not be represented in any single profile drawn from the shore line to the top of the plateau because some of the terraces are very narrow or have in places been completely obliterated by the recession of the sea cliff during the cutting of the next younger terrace or by subsequent erosion. It is difficult to recognize the narrow terraces at higher levels, as they are more degraded than at lower levels. In an ascent of the plateau from Baie de Henne to Bombardopolis about 28 distinct terraces were seen.

There is no evidence to indicate that any of the terraces are older than Quaternary. The limestone on the highest terrace contains the same living species of corals as the limestone on the lowest terrace. The terraces are not so conspicuously trenched by the channels of present streams as in other parts of the Republic because the climate is semiarid and underground drainage has been developed.

The emerged coastal terraces of the Northwest Peninsula reach a greater altitude than emerged terraces of the same age in any other part of the Republic. Directly across the Windward Passage at Cabo Maisé, in Cuba, emerged coastal terraces reach an estimated maximum altitude of 185 meters above sea level, greater than in any other part of that island. The two regions are evidently genetically related. The Cuban terraces have been described by Agassiz,¹ by Hill,² by Hayes, Vaughan, and Spencer,³ and by Vaughan and Spencer.⁴

¹ Agassiz, Alexander, A reconnaissance of the Bahamas and of the elevated reefs of Cuba in the steam yacht *Wild Duck*, January to April, 1893: Harvard Coll. Mus. Comp. Zool. Bull., vol. 26, pp. 110-116, 1894.

² Hill, R. T., Notes on the geology of the island of Cuba: Harvard Coll. Mus. Comp. Zool. Bull., vol. 16, pp. 267-269, 1895.

³ Hayes, C. W., Vaughan, T. W. and Spencer, A. C., Report on a geological reconnaissance of Cuba, made under the direction of General Leonard Wood, Military Governor: Civil Rept. Brigadier-General Leonard Wood, Military Governor of Cuba, 1901, vol. 1, pp. 19-20, 1901.

⁴ Vaughan, T. Wayland, and Spencer, A. C., The geography of Cuba: Am. Geog. Soc. Bull., vol. 34, pp. 112-113, 1902.

Emerged coastal terraces of the same age and at so great an altitude are not known in any of the other West Indian Islands except Barbados, where they reach an altitude of about 320 meters above sea level.¹

Emerged coastal terraces of the same age as these remarkable West Indian terraces and at a comparable altitude are not known anywhere along the coast of the United States except along southern California, where, on the island of San Clemente, according to Lawson,² there are 17 distinct terraces, the highest of which is 402 meters above sea level. On this island two higher terraces, which are more dissected than the others, have altitudes of 419 meters and 457 meters respectively.

ARBRE PLAIN.

The Arbre Plain is a lowland that lies west of the Montagnes de Terre-Neuve and south of the Montagnes du Nord-ouest. It extends from northwest to southeast and is about 25 kilometers long and almost 10 kilometers wide. Its name is derived from the small settlement, l'Arbre, in the interior of the plain. The name Port-à-Piment Plain is sometimes applied to this plain, but it is unsuitable, as Port-à-Piment is at the margin of the plain and there is another Port-à-Piment on the south coast of the Southern Peninsula. Southeast of Port-à-Piment the plain reaches the sea, but to the northeast it is separated from the sea by a narrow, southeastward-tapering terraced ridge, part of the Bombardopolis Plateau.

Near l'Arbre and on the coast at Port-à-Piment the plain is flat over large areas, but at some places, particularly near the Sources Chaudes, it is dotted with small hills, which have a maximum height of 30 meters. At the border of the mountains, on the north side of the plain, broad alluvial fans spread out and merge into the lowland. The maximum altitude of the plain, including the alluvial fans, is probably not more than 250 meters above sea level. The plain owes its origin to the underlying clay and marl of Miocene age, which readily yield to planation but which are almost wholly concealed by a cover of alluvium.

This plain is very arid, probably the most arid part of the Republic, and its most striking surface features are those that characterize arid regions. The mountains on the north rise abruptly above alluvial fans composed of coarse detrital material. Most of the streams that issue from the mountains disappear in a short distance. In times of flood their waters spread out over wide areas of mud-cracked playa or collect in shallow saline lakes that have no outlet. Several of these lakes lie along the southwestern edge of the plain, near the foot of the ridge that separates

¹ See accounts by Harrison, J. B., and Jukes-Brown, A. J., *The geology of Barbados*, being an explanation of the geological map of Barbados prepared by the same authors, pp. 27-34, 1890; Jukes-Brown, A. J., and Harrison, J. B., *The geology of Barbados: Part I, The coral rocks of Barbados and other West Indian islands*: Geol. Soc. London Quart. Jour., vol. 47, pp. 197-243, 9 figs., 1891. (See especially pp. 209-210.)

² Lawson, A. C., *California Univ. Dept. Geol. Bull.*, vol. 1, pp. 128-135, 1893.

the plain from the sea. The dissection of the plain is also typical of erosion in arid regions. Wide, dry arroyos and deep gullies with perpendicular unrounded walls are common at some places, particularly in the northwestern part of the plain.

JEAN RABEL VALLEY.

The Jean Rabel Valley is a lowland on the north side of the Montagnes du Nord-ouest, extending from the vicinity of Jean Rabel eastward to the Trois Rivières Valley. Like part of the Arbre Plain, it is separated from the sea by a seaward-sloping ridge composed of limestone of Quaternary age, which is the eastward prolongation of the outer margin of the Bombardopolis Plateau. The seaward slope of this ridge is terraced, but the inner slope is a steep escarpment. Near Jean Rabel the altitude of the ridge is 250 meters above sea level. The same ridge was seen from a distance west of the mouth of Les Trois Rivières, and it probably extends along the entire north border of the lowland but is interrupted by the valleys of a few streams that pierce it and thus reach the sea.

The surface rocks in the Jean Rabel Valley are soft marl, clay, and sandstone, like those in the Arbre Plain. The heavier rainfall in the Jean Rabel Valley accounts for the marked difference in the surface features. Near Jean Rabel, which is the only locality where the lowland was examined, there are two kinds of major surface features—extensive flat alluvial flood plains along the streams and rolling hills that are 100 to 200 meters higher than the alluvial plains. Surface features of this type, consisting of plains and rolling lowlands, probably extend eastward to the Trois Rivières Valley.

As the coastal ridge and the rolling lowland at the rear of the Jean Rabel Valley have virtually accordant summits, the suggestion seems warranted that a plateau formerly extended over the coastal ridge and the entire lowland. The plateau platform, which was the eastward prolongation of the Bombardopolis Plateau, was cut by marine erosion. Subaerial erosion stripped the thin cover of coralliferous limestone from the inner edge of the plateau, revealing the readily eroded Miocene rocks. The resultant enlarged lowland is the Jean Rabel Valley.

SHORE FEATURES.

The shore features of the Northwest Peninsula from the mouth of Les Trois Rivières westward to Môle St.-Nicolas and thence southward and eastward to Port-à-Piment are described on pages 371-374.

The Arbre Plain extends down to the sea between Port-à-Piment and Pointe Cordion, and the shore is bordered by mangrove swamps that separate extensive saline mud flats from the sea. At Pointe Coridon sea cliffs truncate an unterraced promontory that is part of a ridge extending

to the coast from the Montagnes de Terre-Neuve. Between Pointe Coridon and Pointe la Pierre the shore consists of a gradually narrowing strip of detritus derived from the steep mountain slopes, fringed by sandy beaches.

SUBLITTORAL FEATURES.

The relation between the width of the shallow offshore platform and the presence or absence of emerged coastal terrace is remarkably uniform along the coast of the Northwest Peninsula. From the mouth of Les Trois Rivières westward around the end of the peninsula and southeastward to Port-à-Piment, the platform, as limited by the 20-fathom line, is very narrow, and its outline closely coincides with the outline of the shore line. This platform, on which reef corals are growing, resembles the numerous emerged terraces. Southeast of Port-à-Piment, where the emerged terraces end, the outer edge of the platform diverges from the shore line, and off Pointe la Pierre the platform attains a maximum width of 10.9 kilo-

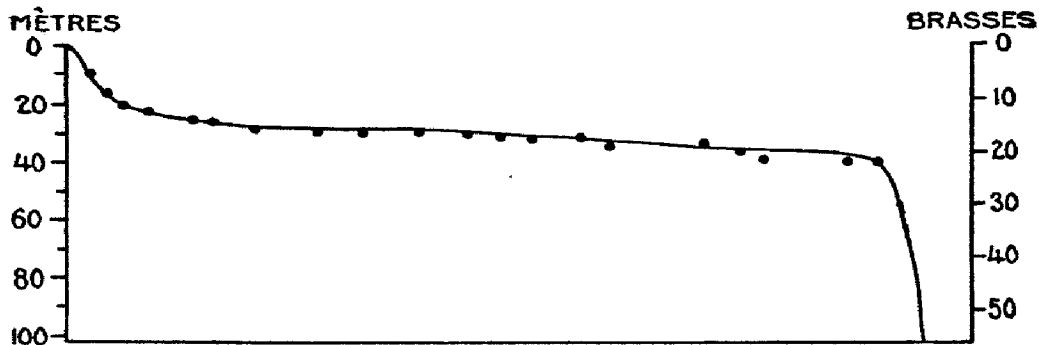


FIGURE 24.—Subaqueous profile off Pointe La Pierre near Gonaïves.
Horizontal scale 1:60,000. Vertical scale exaggerated 20 times.

meters. (See Fig. 24.) The conclusion seems warranted that the greater width of the platform is due to the longer interval of time during which it has been subjected to wave erosion. Figure 24 shows that along this part of the coast the maximum depth of effective wave erosion is 20 fathoms (36.5 meters).

The deep indentations in the offshore platform at Môle St.-Nicolas and Baie de Henne indicate that the valleys that extend into the interior of the plateau at these two localities are structural depressions, probably synclines.

CENTRAL PLAIN.

NAME AND EXTENT.

The name Plaine de Goave, or Guaba, was applied by Moreau de St. Méry and other geographers to the extensive plain between the Massif du Nord and the Montagnes Noires. As that name no longer has any local significance, the name Central Plain, first used by Jones,¹ is here used.

¹ Jones, W. F., A geological reconnaissance in Haiti: Jour. Geology, vol. 26, p. 730, 1918.