

inclosed basin having relations to each other like those of the Cul-de-Sac Plain to the basin of Étang Saumâtre. The plain is part of the sublittoral platform that borders the coast of other parts of the Republic. The maximum depth of water on the flat part of the platform is 20 fathoms (37 meters), but the mean depth is about 17 fathoms (31 meters). Tongues on which the maximum depth is 10 fathoms (18 meters) extend southeastward and northeastward from the southeastern end of Gonave Island along the outer edge of the platform. Smaller ridges encircled by the 10-fathom contour rise above the surface of the platform. The small, low islands called Les Arcadins rise above the surface of the water on one of these ridges. The platform is widest between the northern coast of the Lèogane Plain and the southeastern coast of Gonave Island and off the coast of the Arcahaie Plain. The outline of the platform is very irregular in the harbor of Port-au-Prince, where numerous cays and shoals rise above the surface of the water or lie awash. The outer edge of the platform slopes steeply into deep water. The length of the basin inclosed by the platform from a point south of Les Arcadins to the harbor of Port-au-Prince, is 35 kilometers, and its width is 17.5 kilometers. The maximum depth of water recorded in the basin is 85 fathoms (155 meters).

An emergence of 25 fathoms (46 meters) would unite Gonave Island with the mainland and add an extensive area to the Cul-de-Sac Plain. This area would contain a lake larger than Étang Saumâtre that would resemble the lakes in the subaerial part of the plain.

The platform probably owes its origin to base-leveling at a time when the land stood higher. The basin may have been outlined even at that time, and it may have been accentuated by unequal sedimentation during the Quaternary submergence, although it is difficult to account for rapid sedimentation across the northwest end of the platform. Inequalities on the platform have been and still are being planed off by wave erosion subsequent to the emergence that is known to have affected the subaerial part of the plain.

MASSIF DE LA SELLE.

NAME AND EXTENT.

The name Massif de la Selle, which is derived from Mont La Selle, its highest peak, is used here for the mountainous area in the southeastern part of the Republic. Geographers have used the name Montagne de la Selle for the range of which Mont La Selle is a part, but no name has heretofore been given to the entire mountainous complex.

The Massif de la Selle is the northwestward prolongation of the Sierra de Bahoruco of the Dominican Republic. The western boundary of the massif is not well defined, but between Jacmel and Grand-Goave the mountains are low, and as the geologic history of the more mountainous

region to the east differs from the history of the mountainous region to the west, this break is taken as the boundary.

The area included in the Massif de la Selle is 100 kilometers long and has an average width of 30 kilometers.

GENERAL FEATURES.

Most of the Massif de La Selle is extremely mountainous. The largest coastal plain in this region, Léogane Plain, is on the north coast, and a narrow lowland extends almost continuously from this plain eastward to Port-au-Prince, where it merges into the Cul-de-Sac Plain. On the south coast there are very small coastal plains at Jacmel, Cayes de Jacmel, Saltrou, and Anse-à-Pitre. A narrow lowland extends along the south coast from Jacmel eastward to the mouth of Rivière de Fesle near Marigot.

The surface trends of the Massif de la Selle coincide approximately with the northwestward strike of the older rocks except where undeformed younger rocks overlap the older rocks.

LAND FEATURES.

MOUNTAINS.

NORTH SLOPE.

The mountains on the north slope of the Massif de la Selle rise boldly above the Cul-de-Sac Plain. They are composed mainly of limestone but certain spurs at their bases are composed of younger detrital rocks. The contrast between the two groups of rocks is sharply defined, as the slopes of the limestone terrane are much steeper but less intricately dissected.

South of Port-au-Prince is a narrow, steep ridge called Morne Hôpital, which, as determined trigonometrically by the Service des Levés Topographiques, rises to an altitude of 1,040 meters above sea level, towering above the city. The ridge trends about N. 75° W., parallel to the strike of the rocks. The upper part of the northern slope is very steep and conforms closely to the steep northward dip of the rocks. South of the ridge and approximately parallel to it is the deep, narrow valley of Rivière Froide. To the west, where the ridge is lower, it is crossed by Rivière Froide in a narrow gorge. The prolongation of the ridge farther west strikes into the Léogane Plain. Toward the east Morne Hôpital loses its identity, but the first ridge between Pétionville and the gorge of the Grande Rivière du Cul-de-Sac is essentially its prolongation. The first ridge east of the Grande Rivière du Cul-de-Sac reaches an altitude of 984 meters above sea level in Morne des Enfants Perdus, as determined trigonometrically by the Service des Levés Topographiques. Eastward from Morne des Enfants Perdus the front range

apparently consists of several ridges aligned parallel to the strike of the rocks.

The trail from Pétionville to Furcy crosses the crest of a second ridge about 5 kilometers south of Pétionville at an altitude of 1,200 meters above sea level. Fort Jacques, which, as determined trigonometrically by the Service des Levés Topographiques, has an altitude of 1,340 meters above sea level, stands on the eastward prolongation of this ridge. The ridge terminates south of Morne Hôpital on the north side of the valley of Rivière Froide.

The mountains on the north slope of the massif owe some of their peculiar surface features to solution of the limestone by ground water. On the crest of the first ridge southeast of Fond-Parisien the trail to Fond-Verrettes crosses a shallow elliptical depression, apparently a sink hole. The floor of this depression, like that of most sink holes, has a thick covering of fertile soil, most of which is cultivated. The longer axis of the depression is parallel to the strike of the rocks. Fond-Verrettes, also called Mission, stands 810 meters above sea level, in a narrow U-shaped valley, the sides of which rise steeply to perhaps 250 meters above the valley floor. The valley parallels the northwestward strike of the rocks and probably has been widened and deepened by solution. Near the east end of Morne Hôpital a small, deep sink hole was seen. About 1 kilometer southeast of Rendez-vous there is a wide, deep sink hole, the floor of which is under intensive cultivation. A small sink hole was seen only a few hundred meters south of the crest of the mountains at an altitude of nearly 1,700 meters, on the trail from Fond-Parisien to Grand Gosier.

INTERIOR.

EASTERN PART, INCLUDING MONTAGNE DE LA SELLE.

The highest mountains in the Massif de la Selle are in the interior. The surface features of the eastern and western parts are quite different. The surface features of the eastern part are relatively simple, apparently because the entire region is composed of limestone. The limestone is folded and generally strikes north of west. The dominant feature of the region is a high, narrow central range known as Montagne de la Selle, the summit of which, Mont de la Selle, as determined trigonometrically by the Service des Levés Topographiques, stands 2,680 meters above sea level and, according to all available information, is the highest point in the Republic. Mont de la Selle is not a clearly isolated peak but rather a broad eminence. The profile of the mountain, viewed from the north, is fairly smooth, showing a gradual slope eastward to the Dominican border but a somewhat steeper slope westward. During the rainy season Mont de la Selle is hidden most of the time by clouds.

Deep ravines separated by high ridges furrow the steep north and south slopes of Montagne de la Selle. The trail from Fond-Parisien to

Grand-Gosier crosses the divide at an altitude of 1,700 meters above sea level. On the north slope it ascends from an altitude of 810 meters at the valley of Fond-Verrettes to an altitude of 1,500 meters in a distance of about 7 kilometers. On the south slope it descends from 1,500 meters to 950 meters in a distance of about 5 kilometers. Near the crest the slopes are not so steep.

WESTERN PART.

The surface features of the mountains in the western part of the interior of the massif are more varied than those in the eastern part because the surface rocks are more varied and the structural features are more complex. The surface rocks include basaltic volcanic rocks and limestone, and the structure is complicated by faulting. The region comprises a wide central highland of basalt flanked on the north and south by still higher limestone ranges.

The lofty limestone range on the north side of the area of basalt forms the sky line as seen by an observer stationed in the Cul-de-Sac Plain. On some maps this range is designated the Montagne Noire, but this range should not be confused with the Montagnes Noires of the Département de l'Artibonite (see p. 382). In general features this range resembles Montagne de la Selle. Its crest along the trail from Pétionville to Furcy has an altitude of 1,680 meters above sea level. The highest peaks, Morne Tranchant (altitude 1,926 meters) and Morne Noir (also called Morne Pays-Pourri; altitude 1,805 meters as determined trigonometrically by the Service des Levés Topographiques) are on the crest of the range west of the Furcy trail. East of the Furcy trail the range is less conspicuous and west of Morne Noir its height diminishes until it is hardly recognizable west of the gorge of Rivière Momance. The deep valley of Rivière Froide separates this range from Morne Hôpital. The crest of the range trends about N. 70° W.

The central area is about 60 kilometers long and has a maximum width of 16 kilometers. It comprises probably the most rugged mountains of the Republic. The characteristic feature of the area is its intricate dissection in a complex dendritic pattern. Long flat-topped spurs extend southward a little distance into this region from the foot of Montagne Noire. The village of Furcy is on such a spur at an altitude of 1,520 meters above sea level. In the main body of the area the flat-topped spurs are replaced by knife-edge divides, which separate the lateral streams, tributaries of the Rivière Momance. The valleys and ravines are deep and V-shaped. The maximum relief in the region southeast of Furcy is about 700 meters. Precipitous rock slopes are common at the heads of ravines and there are numerous waterfalls. Trails plunge abruptly several hundred meters down into ravines.

The surface is equally rugged along the trail that ascends Rivière Gosseline from Jacmel to Port-au-Prince. This trail leaves Rivière Gos-

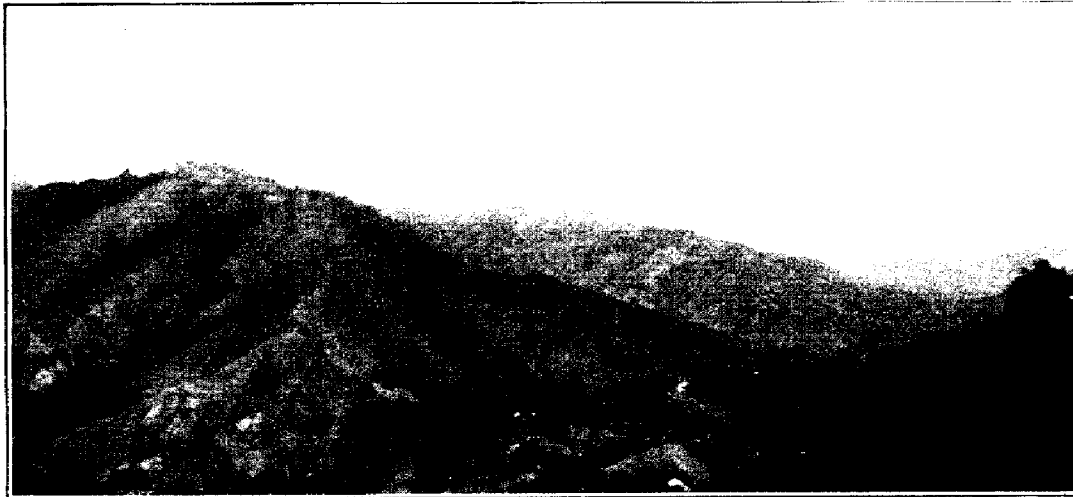
seline at an altitude of 240 meters above sea level and follows Rivière Mabial to an altitude of 450 meters; then, within a distance of 6 kilometers, it ascends to 1,330 meters above sea level on the crest of the divide between Rivière Gosseline and Rivière Momance. Westward from this trail the mountains are lower but are as intricately dissected as the higher mountains farther east. (See Pl. XXXII, A.) The main trail from Jacmel to Port-au-Prince, which follows the Grande Rivière de Jacmel, crosses the divide at an altitude of 400 meters above sea level. These mountains extend northward to the Léogane Plain.

On the south a high range overlooks the area of basalt as far west as the longitude of Port-au-Prince. It has a general east to west trend, but its western part appears to consist of segments arranged *en échelon*, which strike northwestward into the area of basalt and terminate along abrupt scarps. A segment southeast of Furcy culminates in Morne Cabaio (also called la Fenêtre), which has an altitude of 2,280 meters above sea level, as determined trigonometrically by the Service des Levés Topographiques. The last segment ends abruptly about 10 kilometers west of Morne Cabaio. Its summit, which has an estimated altitude of 2,000 meters above sea level, overlooks the rugged mountains in the area of basalt both to the north and west. The prominent white cliffs on its slopes indicate that this range, like that on the north side of the area of basalt, is composed of limestone.

SOUTH SLOPE.

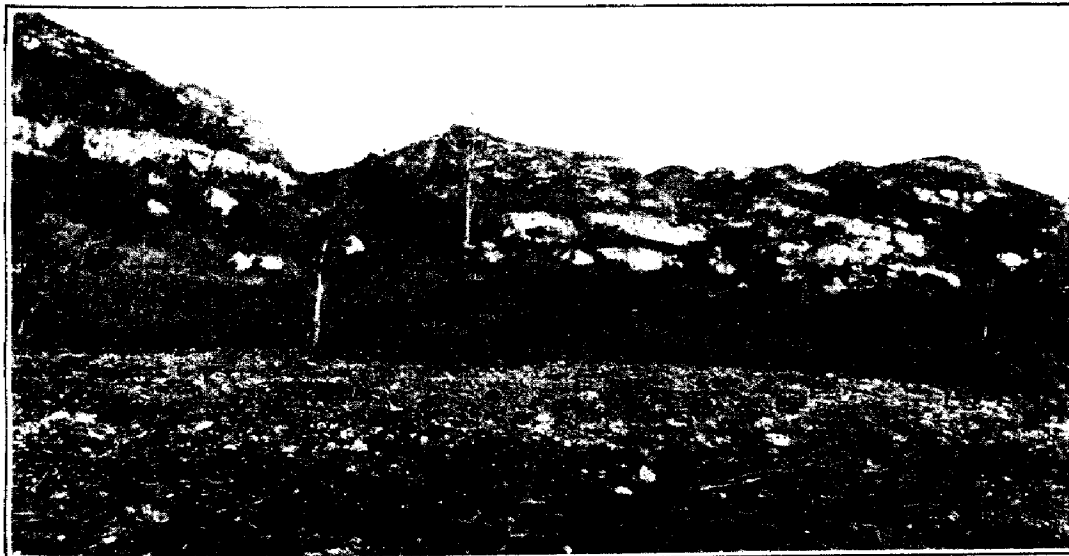
On the south slope of the massif the mountains extend almost or quite to the shore line. On this slope, as in the interior, the variety of surface rocks and of surface features is greater in the western than in the eastern part. The mountains are not so clearly aligned in ridges as in the interior and on the north slope, and the relation between the structural trends and surface features is correspondingly less distinct.

The entire region east of Marigot is very rugged, and mountains of limestone descend to the coast. The maps show a trail following the coast from Grand-Gosier to the Dominican border, but such a route could be traversed only on foot. Between the settlement called Adieu-au-monde and Saltrou the trail in use leaves the coast to avoid high sea cliffs. It extends almost due east from Grand-Gosier to Banane on Rivière Pédernales and thence follows the river down to Anse-à-Pitre. The highest ridge crossed by the trail is 680 meters above sea level. West of Banane the trail follows a narrow U-shaped valley that trends about N. 60° W., parallel to the strike of the rocks. This valley, like so many other narrow strike valleys in limestone terranes in other parts of the Republic, has probably been widened and deepened by solution along bedding planes. The ridge on the south side of the valley has a very jagged crest.



1. VIEW OF THE CITRONNIERS VALLEY LOOKING NORTHWARD FROM A LOCALITY A FEW KILOMETERS NORTH OF THE CREST OF THE MOUNTAINS ALONG THE TRAIL FROM JACMEL TO LÉOGANE.

The rocks are basaltic lavas.



2. JAGGED LIMESTONE RIDGE ON THE NORTH SIDE OF THE MAPOUX PLAIN, GONAÏVE ISLAND.

Between Marigot and Jacmel the surface features are more diversified. The mountain slopes are separated from the sea by a narrow lowland. Small grass-covered conical hills composed of basalt border the Cayes de Jacmel Plain, especially on the northwest side. Back of these hills are steep mountain slopes, which at many localities rise in sheer cliffs. A lowland extends northwestward from Jacmel up the valley of Rivière Gauche. It coincides with the area of a marine embayment that was filled with coarse sediments during Pliocene time.

PLAINS.

LÉOGANE PLAIN.

The Léogane Plain is the only large plain within the area of the Massif de la Selle. It is rectangular in outline and has a length from east to west of about 12 kilometers and a maximum width of 10 kilometers. It lies across the northwest ends of the mountains on the north slope of the massif. The floor of the plain consists of alluvium deposited by Rivière Momance and Rivière des Citronniers on a platform that is genetically related to the submerged platform extending northwestward to Gonave Island. The plain evidently owes its origin to sedimentation on this platform, and it is being continually enlarged northwestward along the shallow outer margin of the platform.

DRAINAGE.

The interior mountains of the massif form a divide from which the streams flow either into Port-au-Prince Bay and the Gonave Canal, to the north and northwest, or into the Caribbean Sea, to the south. At some places the stream courses are controlled by the structure. Rivière Momance, the largest stream, rises in the central area of basalt, where it receives many tributaries, flows almost due northward across the westward prolongation of Montagne Noire, and then turns abruptly westward, emerging on the Léogane Plain along the fault contact between the basalt and limestone. Rivière Froide rises on the north slope of the Montagne Noire near Rendez-vous, flows northwestward approximately parallel to the strike of the rocks and then turns northward, piercing the westward prolongation of Morne Hôpital in a narrow gorge. Rivière Momance and Rivière Froide are not more than a kilometer apart where their courses change direction, but they are separated by a narrow ridge whose crest is about 30 meters above the bed of Rivière Momance and 65 meters above Rivière Froide.

The south slope is not so well watered as the north slope except near Jacmel, where the mountains are much lower and the rain-bearing winds from the northeast are less completely robbed of their moisture than in other parts of the massif. Rivière Gauche, a tributary of Grande Rivière de Jacmel, the largest stream on the south slope, flows southeastward

in the narrow basin of Pliocene rocks near Jacmel. Rivière Adieu-au-Monde, a very small stream, is the only through-flowing stream between Rivière de Fesle and the Dominican border, where Rivière Pédernales reaches the sea.

Étang Bossier is a small lake on the south slope of the mountains about 5 kilometers northwest of Cayes de Jacmel. It has been described as a crater lake, but there is no evidence to support such a conclusion. It occupies a depression in the irregular topography along the contact between limestone on the east and basalt on the west. In November, 1920, the surface of the lake was about 10 meters lower than the possible outlet toward the Cayes de Jacmel Plain.

SHORE AND SUBLITTORAL FEATURES.

NORTH COAST.

SHORE FEATURES.

Rapid alluviation has been the principal factor in determining the shore features of the north coast from Port-au-Prince westward to Grand-Goave. Long stretches of the shore are bordered by a fringe of mangrove thickets. Barren mud flats lie back of the mangrove thickets at several localities, especially near Grand-Goave. The alluvial fringe is widest at the mouth of Rivière Froide and at the Léogane Plain, where it extends far into the interior.

The alluviation has accompanied and followed emergence of the shore line. Evidence of emergence is afforded by marine sediments of Quaternary age. Such sediments were seen near Trou Jean Roger and at a point 0.5 kilometer east of Grand-Goave. At both places the marine beds seem to be remnants of a narrow terrace that rose 30 to 40 meters above sea level. The seaward face of the terrace is a sea cliff, the base of which is only a few meters above tide and less than 100 meters back of the shore line. At other localities imperfectly consolidated gravels, which probably are of the same age as the marine beds, have been dissected by the present streams.

SUBLITTORAL FEATURES.

The sublittoral features of the north coast from Port-au-Prince to Léogane are described on pages 397-398. Between Léogane and Grand-Goave there is a narrow sublittoral platform.

SOUTH COAST.

SHORE FEATURES.

Jacmel Bay is the largest indentation along the south coast of the massif. At the head of the bay there is a small alluvial plain built by Grande Rivière de Jacmel and Rivière des Orangers. Prominent sea cliffs extend along both sides of the bay. On the west side of the bay the cliffs

that extend around Cap Jacmel are about 9 meters high. They truncate coralliferous limestone of Quaternary age. Between Cap Jacmel and the head of the bay cliffs that have a maximum height of 70 meters truncate promontories composed of older limestone. Cliffs that have a maximum height of 12 meters extend along the east side of the bay from the town to Cap Maréchaux. These cliffs truncate a terrane of marine and non-marine beds of Quaternary age that extends eastward from Jacmel to Au Banc Poste, where a low ridge from the mountains reaches the sea. A small alluvial plain extends back from the coast at Cayes de Jacmel. Between Cayes de Jacmel and Marigot a narrow beach fringes the shore. The town of Marigot stands at the west end of an alluvial fill at the mouth of Rivière de Fesle.

The shore features change eastward from the mouth of Rivière de Fesle. As far eastward as Adieu-au-Monde there are sea cliffs separated by small coves with bayhead beaches. Between Adieu-au-Monde and Saltrou the sea cliffs are almost continuous. Saltrou stands on a small alluvial apron. Between Saltrou and the Dominican border high ridges truncated by lofty sea cliffs descend to the shore. Three kilometers northwest of Grand-Gosier the cliffs are 200 meters high. Grand-Gosier stands about 10 meters above sea level. Along the shore a thin veneer of imperfectly consolidated subangular beach shingle covers the bedrock between the cliffs. In the first cliff west of Grand-Gosier a thickness of about 10 meters of this beach shingle is exposed.

A similar shore line from which the mountains rise abruptly continues from Grand-Gosier southeastward to the plain at Anse-à-Pitre, on the Dominican border. The international boundary straddles the plain, which extends about 5 kilometers inland and which along the Haitian coast has a width of about 4 kilometers. It is one of the most desolate regions in the Republic; its only vegetation is cactus and spiny leguminous shrubs. It is unlike the other small plains on the south coast in that only its seaward margin is covered with alluvium. The remainder is floored with pitted brecciated limestone, which at some places is concealed by a thin covering of soil. The inner part of the plain has an altitude of 75 meters above sea level and Rivière Pédernales is intrenched about 15 meters below its surface. This plain apparently is an emerged and tilted wave-cut abrasion platform. On the western or Haitian side of the frontier it is bounded by a low ridge composed of the same bare, jagged brecciated limestone that floors the plain. About 3 kilometers northwest of Anse-à-Pitre the low ridge on the west extends to the shore and is truncated by sea cliffs. Small patches of firmly cemented beach pebbles and fragments of the shells of mollusks, especially *Strombus gigas*, are plastered against the cliffs up to an altitude of 10 meters above sea level. These patches of beach pebbles indicate the most recent emergence of the coast. The plain probably was formed during several periods of emergence, as several emerged coastal terraces are visible far to the southeast in the Dominican Republic.

The shore features of the south coast of the Massif de la Selle are not so homogeneous as those of some of the other geographic divisions of the Republic, but the evidence of recent emergence is clear. Areas of Quaternary marine rocks are extensive only in the region near Jacmel, where they reach an altitude of 65 meters above sea level. Farther east, where mountains border the coast, the emergence apparently has not been so great except near the Dominican border, although at almost every locality where the shore was seen there is evidence of an emergence of about 10 meters.

SUBLITTORAL FEATURES.

The sublittoral platform that parallels the shore around the indentation of Jacmel Bay is very narrow, indicating that the bay is the submerged part of the southeastward-plunging trough, which during Pliocene time was a bay that extended far inland toward the northwest.

Between Jacmel and Marigot the sublittoral platform is narrow. East of Marigot it is wider and attains a maximum width of 10 kilometers, as limited by the 20-fathom line. Along this part of the coast the outline of the platform is more irregular than it is farther west. It seems unreasonable to assume that so wide a platform has been planed off by wave erosion since the emergence of about 10 meters, but as an emerged wave-cut platform is not exposed at the foot of the cliffs it is assumed that the water on the platform was about 10 meters deeper before the emergence.

The slope from the outer edge of the platform into deep water is very abrupt. Within a distance of 1.5 kilometers from the outer edge of the platform a depth of 1,095 fathoms (2,002 meters) is recorded. The maximum recorded depth near the shore, 2,245 fathoms (4,106 meters), is only 15 kilometers from the outer edge of the platform.

MASSIF DE LA HOTTE.

NAME AND EXTENT.

The name Massif de la Hotte is here applied to the area that embraces most of the long Southern Peninsula and is derived from the name of the highest mountains in the region, the Montagnes de la Hotte, which are in its western part. The Massif de la Hotte is imperfectly separated from the Massif de la Selle by a narrow gap that extends from Jacmel to Grand-Goave, and there is no abrupt change in the surface features of the two regions. The massif is about 185 kilometers long and has an average width of 35 kilometers.

GENERAL FEATURES.

The Massif de la Hotte is the largest geographic province in the Republic to which a separate name has been applied. It contains a great variety of surface features, and is divisible into prominent surface units that are here described as separate subdivisions.