

## PART II. GEOLOGY.

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### RECONNAISSANCE GEOLOGIC MAP.

The reconnaissance geologic map (Pl. I, in pocket) is accurate to the published scale only along the routes traversed during the reconnaissance shown on Plate III (p. 24). In compiling it the maps published by Mr. L. Gentil Tippenhauer (see bibliography, p. 603) have been freely used. Regions distant from the routes traversed were mapped principally by long-range observations supplemented by Tippenhauer's maps.

The base map was compiled by the Service des Levés Topographiques under the supervision of Mr. Glenn S. Smith, chief of the Division of West Indian Surveys of the Topographic Branch of the United States Geologic Survey. The delineation of almost the entire shore line, of the features near the shore line, and of the course of Rivière Artibonite from its mouth to Mirebalais is based on aerial photographs controlled by triangulation, work done under the direction of Mr. E. L. McNair, of the United States Geological Survey. The location of towns and other features in the interior is based on all available published and unpublished information supplemented by personal observations. The topographic surveys were suspended in the winter of 1921-22 from lack of funds.

### SEDIMENTARY ROCKS.

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#### PALEOZOIC (?) METAMORPHIC ROCKS.

Sedimentary rocks are exposed at the surface over fully four-fifths of the Republic. Their age ranges from probably Paleozoic to Recent.

Metamorphic rocks, probably of Paleozoic age, occur as float on the North Plain and on the Léogane Plain and are found in place on Tortue Island. Quartz schist and mica schist were found as float on the North Plain east of Limonade. Although no bedrock exposures of the schist were seen the fragments found presumably represent a metamorphic basement on which the old basaltic rocks lie. These schists are much more metamorphosed than any of the old volcanic rocks or Cretaceous sediments and are therefore considered Paleozoic or early Mesozoic.

A specimen of garnetiferous quartz-mica schist that was found as float on the plain a little east of Le Trou shows the highest degree of metamorphism seen in any rock collected in the Republic. This rock is greenish gray to dark gray, fine grained, and distinctly schistose. It is spotted

with pinkish to reddish-brown patches of garnet. In thin section the rock is seen to be composed essentially of quartz, chlorite, biotite, magnetite, and garnet. The quartz comprises about 70 to 75 per cent of the volume and has a characteristic mortar structure, produced by granulation of the borders of the grains. The chlorite and brown biotite comprise 15 to 20 per cent of the rock and together with the finely crushed quartz occupy the spaces between the larger grains of quartz. Considerable magnetite and some rounded patches of garnet are scattered through the rock. The garnet has a slight reddish tinge and apparently has replaced the chlorite, mica, and quartz between the larger grains of quartz. The rock may have been formed by the metamorphism of an impure sandstone. It shows evidence of intense dynamic and thermal metamorphism of a character not observed as the result of deformation caused by intrusions of igneous rock in Cretaceous and later times.

Exposures of these older rocks were found on Tortue Island beneath limestone that is probably of upper Oligocene age. There the metamorphic rocks consist principally of much sheared limestones that have been completely recrystallized and in some places partly replaced by chlorite, epidote, and quartz. The limestone is exposed in a sea cliff a short distance east of the landing at La Vallée, on the south coast. It is a hard bluish-gray rock and contains a network of seams of calcite. About 150 meters east of the landing greenish limestone containing chlorite and stringers of quartz crops out in a sea cliff. Bluish schistose limestone underlies this rock. The beds are contorted and wrinkled. The schistosity planes in general strike N. 80° W. and dip 20° NE. Similar rocks crop out in the huge amphitheater inland from La Vallée, where the cover of upper Oligocene limestone has been stripped by erosion, but along trails their exposures are weathered. Float of a granitic rock, which presumably intrudes the schistose limestone, was seen on the trail to Source Lavier. Schistose rocks were also seen northwest of Pointe des Oiseaux, where the trail from La Vallée descends to the coast. The schistose limestone resembles similar rock on the south slope of Samaná Peninsula, Dominican Republic.<sup>1</sup>

No exposures of schists considered to be older than Cretaceous were found in the southern part of the Republic, but float consisting of mica and quartz schists like those from the northern part of the Republic was seen on the western part of the Léogane Plain. This material probably comes from an unexplored part of the mountains south or southwest of the plain.

#### CRETACEOUS SYSTEM.

Rocks that can be positively identified from fossil evidence as Cretaceous are confined to the Upper Cretaceous series. They consist principally of limestone and were found in only a few small patches in the

<sup>1</sup> A geological reconnaissance of the Dominican Republic: Dominican Rep. Geol. Survey Mem., vol. 1, pp. 53, 83, 182-183, 1921.