SURVEY OF THE GEOLOGY OF HAITI

GUIDE TO THE FIELD EXCURSIONS IN HAITI

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By

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As can be seen from Figures 1, 10, Hispaniola is bounded and transected by major fault systems related to major structural dislocation along the northern edge of the Caribbean plate. These major fault zones also coincide with intense source of seimic activities on the island (Scherer 1912; Sykes and Ewing 1965; Molnar and Sykes 1969; and others). Nonetheless, an intense source of intermediate earthquake foci has also been reported beneath the eastern end of Hispaniola (Sykes and Ewing, 1965), although there is no known surface dislocation in the area. The hypocenters further show an apparent increase in depth dipping beneath the island. Bracey and Vogt (1970) suggested that such distribution pattern of the earthquake foci represent an actual underthrusting zone toward the southeast. They also indicated that the unnderthrusting plane could vary in dip from about 11^{o} in the northeast to 60^{0} in the southeast areas. The small underthrusting slab would have a hinge fault at its southeastern and northwestern ends, which would mark the juncture of the Puerto Rico and Cayman fault systems (Bracey and Vogt, 1970). Molnar and Sykes (1971) objected to this interpretation on the basis that there are no historically active volcanoes in eastern Hispaniola. Furthermore, they pointed out the fact that the seismic pattern scatters considerably over Hispaniola, and west to Jamaica. Thus, deformation inducive to seismic activities on the island is probably taking place over a broad fault zone or fault system, and a simple plate boundary between the Cayman Trough and the Puerto Rico Trench would not appear to exist (Molnar and Sykes, 1971). This view is compatible with the actual complexity of the fault systems of the island (figure 3), as previously mentioned. Nonetheless, Frankel (1982) reported that a composite focal mechanism for microearthquakes along the northeastern border of the Caribbean plate indicates that oblique underthrusting of the North American plate beneath the Caribbean plate occurs in the area farther east of Hispaniola. The oblique motion is accomodated along a thrust plane that dips at a relatively shallow angle beneath the Virgin Islands platform.

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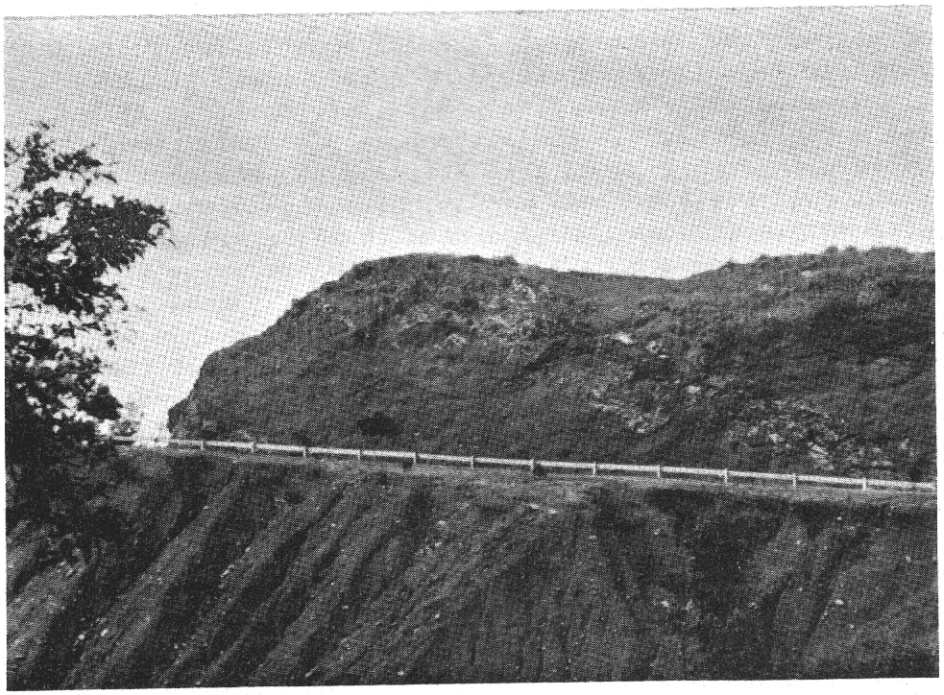
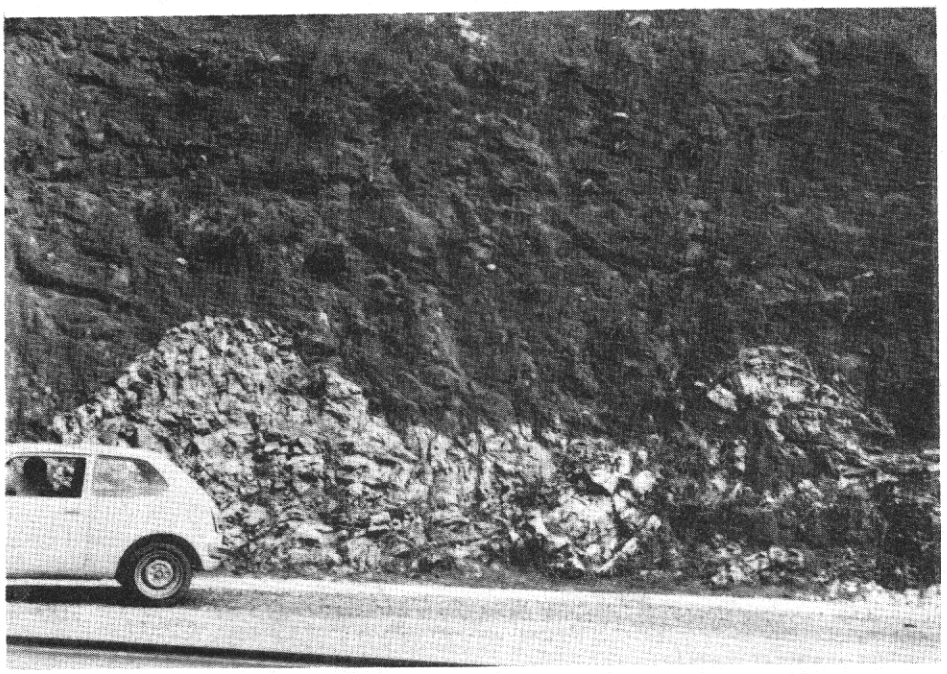
Taking account of the wealth of information that has become available on the geology of Hispaniola during the past ten years or so, it has also become clear that a revision of the geological history of the island is wanting. Nonetheless, it should be recognized that early works such as those by Tippenhauer, 1899, 1909; Jones, 1918; Vaughan et al., 1921; Woodring et al., 1924; Butterlin, 1954, have served worthy purpose and deserve commendation.

Recent summaries synthesizing the geologic history of the island based on most data gathered in the sixties and seventies have been given by Bowin (1975), and Lewis (1980). A model suggesting a possible scenario for the evolution of Hispaniola and the Caribbean as a whole has also been discussed by Maurrasse (1982c). In the present guide the writer will not attempt to reconstruct the detailed geologic history of the island, but will instead discuss some aspects of the paleogeography and tectonic of the island as can be deduced from the geologic record examined during the field trip.

FIGURE 9



a: Dumisseau Formation as seen in road cut on the road between Carrefour Dufort and Jacmel.



b: Dislocated limestone block in the igneous complex of Dumisseau Formation. Same location as above .