THE GEOLOGY OF BARBADOS

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BY

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AND

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OF THE GEOLOGICAL SURVEY OF GREAT BRITAIN.

BEING

AN EXPLANATION

OF THE GEOLOGICAL MAP OF BARBADOS PREPARED BY THE SAME AUTHORS.

PUBLISHED BY AUTHORITY OF THE BARBADIAN LEGISLATURE.

1890.

PREFACE.

In the following pages we have endeavoured to explain the geological structure and surface features of Barbados in such a manner that they may be understood by any educated person without his having any previous knowledge of Geological Science.

Such technical terms as are necessarily used we have explained in the first chapter.

The chapters which treat of the formation of the Gullies and of the Physical History of the Island will doubtless have some interest for all who are acquainted with Barbados; and we hope that those on Soils and Economic Products will have a practical value for all who are commercially interested in the island.

We are indebted to several friends both in Barbados and England for assistance and information. Due acknowledgment is given in the text, but among them we may especially mention Mr. E. Easton, C.E., F.G.S., Mr. G. F. Franks, Mr. R. C. Piggott, Mr. J. W. Gregory, F.G.S., and Mr. W. Hill, F.G.S.

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CHAPTER I.

General Description.

The island of Barbados has an extreme length of a little over 21 miles as measured from the South Point to the North Point and a width of about 11 miles between Bridgetown in the south-west to Congor Rock on the eastern coast, but in the northern part of the island the width is only half as much. Its total superficial area is estimated at 166 square miles and its greatest elevation above the sea level is 1104 feet.

In the southern portion of the island the land rises by a series of slopes and terraces to a ridge which runs nearly due east and west, and has a maximum elevation of 400 feet; north of this there is a broad depression or valley which nowhere rises above 150 feet. From this the land rises again to a central ridge which describes a curve round the parishes of St. Joseph's and St. Andrew's, and is for a length of several miles between 1000 and 1100 feet above the sea.

The district enclosed by the semicircular sweep of this ridge differs in its soils and physical features from the rest of the island, and is the only part which has a regular system of hills and valleys. This area is known as the Scotland district, because its comparatively bold and rugged scenery reminded some of the early settlers of the Scottish Highlands at home. It is within this district and its narrow continuation below Hackletons Cliff to Consett Bay that the key to the geological structure of Barbados is found.

The geology of Barbados is not so complicated as that of some of the other West Indian islands, such as Trinidad and Jamaica, which possess a much larger series of rock groups, but it is more varied and interesting than some of the smaller islands, which are either wholly volcanic (like St. Vincent) or consist of volcanic rocks partially covered by coral limestone (like Antigua and St. Kitt's).

There are no volcanic rocks in Barbados; the idea that a core of volcanic rock was exposed in the north-eastern part of the island is a mistake; fragments of volcanic rocks are not unfrequently found

in the surface soil, having been brought to the island in the guano which has been so largely used for agricultural purposes, and some of these were shown to a well-known American savant, who too readily accepted the statement of his unscientific informant that they were found "*in situ*." The still older idea that the ridge surrounding the Scotland district is the rim of a partially destroyed volcanic crater has no foundation in fact, and was merely suggested by the semicircular sweep of the ridge and its steep inward slope. Even Sir R. Schomburgk in his History of Barbados attributes the gullies which radiate from this ridge to cracks initiated by volcanic agency, but no modern geologist would entertain such an idea. During our survey of the island we did not discover even so much as a single dyke of volcanic rock nor any sign of surface volcanic agency: the upheaval of the island may have been due to such agency, but if so the subterranean force expended itself in the uplift without producing any further manifestation at the surface.

Neither are there in Barbados any rocks belonging to the more ancient formations, such as exist in Trinidad, San Domingo, and Jamaica; the rocks of which the island consists were all formed during the later part of the Earth's history and belong to the era which is known as the Tertiary. We recognise portions of three distinct massive formations besides the more recent surface deposits and soils which have been found since the island became dry land. The following are the names under which we shall describe the several formations and the colours by which they are distinguished on the map:—

The *Scotland series* coloured *brown*.
The *Oceanic series* coloured *blue*.
The *Coral limestones* coloured *yellow*.
The *Valley deposits and Blown Sand* coloured *green*.

The Scotland Series is found to be the oldest of these rock-groups because it always occupies an inferior position to the others, that is to say, the upper surface of the Scotland group passes underneath all the other formations, making it clear that the rocks of this group must have been formed first and the others afterwards. The fundamental principle of geological classification is simply this, that the strata which emerge or crop out from beneath all the others that occur in a district are the oldest, and each succeeding bed or group of beds is newer than that which they overlie. It is only in this way that the geological succession of a new country can be established.

The Scotland rocks consist chiefly of sandstones and dark sandy clays; they form the core and basis of the whole island, that is to say of all that is above the sea level, and though they are only exposed in the Scotland district and in a few other isolated spots, yet they actually underlie the whole island and have been reached in different places by some of the borings made for the Water Supply Company.

The Oceanic Series comprises the white earths and chalks which occur in so many places above the Scotland rocks, and with these are included certain soft variegated clays (red, yellow and white) which occur at several localities. These coloured clays must not be confounded with the red clayey soil which lies on the higher plateaux of the coral limestone. The red clays of the Oceanic series pass under the coral rocks and have the appearance of marls rather than clays, although they do not contain any carbonate of lime. The Oceanic deposits do not cover very large exposed areas, but they underlie much of the coral limestone at a greater or less depth from the surface.

The Coral Limestones, which cover about six-sevenths of the whole area of the island, form a coating or mantle of greater or less thickness over the surface of the older formations. Although they occur up to a height of 1100 feet above the sea, the actual thickness of the limestone at any one place does not seem to exceed 260 feet. As this rock was formed during the gradual upheaval of the island the higher terraces and plateaux are of older date than the lower levels. The terraces are in fact the remains of ancient coral reefs, and each one marks a stage in the gradual elevation of the land.

The recent detrital deposits consist chiefly of gravel, sand and mud which have been washed down into the valleys of the Scotland district during times of heavy rainfall. Along the eastern coast there are long mounds of sand which have been blown up off the shore by the wind.

The white lines which traverse the map in different directions indicate planes of fracture and dislocation, that is to say they show the places where the strata have been broken and where the rocks on one side of the fracture have been moved upward or downward, as the case may be. Such displacements are called *Faults*; the actual course of a fault is not always a straight line, and the lines drawn on the map are only meant to indicate the general direction in which each fracture runs. Neither must it be supposed that