

THE CORAL CAYS OF JAMAICA.

(From an article by J.A. STEERS published in *The Geographical Journal*, London, January 1940, page 30).

In July 1939, an expedition organised under the auspices of Cambridge University, left for Jamaica to study certain aspects of the flora and fauna of that island as well as the physiography of its surrounding sand cays. The Royal Geographical Society of London also lent its help which enabled a surveyor to join the expedition.

The January 1940 issue of *The Geographical Journal* published the report of Mr. J.A. STEERS on these cay formations, which in some ways recall the cays found in Australia on the Great Barrier Reefs of Queensland.

The expedition studied more particularly the Portland Bight cays and the Morant cays which are situated some 60 miles south-east of Kingston.

In a general way, these formations are covered by vegetation, from grasses and creeping plants to dense woodland. One of the most curious characteristics is the beach-rock by which the cays are sometimes surrounded. This beach-rock is a conglomerate of sand or coarse shingle cemented by carbonate of lime into a hard rock, the formation of which no comprehensive theory has yet explained.

On the strip of beach subject to wave action and which forms a "promenade", this border of petrified rock is found. It is quite wide but its vertical range is seldom more than 3 feet, and usually less.

Halimeda sand is particularly abundant on all the islands examined, and in many cases forms a large proportion of the material of which they are built. Coral colonies are also found but they do not form such massive reefs as, for example, those in Queensland.

Cays are unstable structures, much modified or even completely obliterated by storms and hurricanes.

The expedition took particular care in mapping out those cays to which it is difficult to accede owing to dense vegetation, and for the study of which it is necessary to evolve special methods as described in the Appendix reproduced below.

Appendix :

THE SURVEY METHODS EMPLOYED ON THE CAYS.

by

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With the assistance of two of the schooner's crew, it was possible to develop a method of survey which offers many advantages for this type of work. Fifteen islands were mapped by running a close traverse round them, measured with a 100-foot chain, and by taking bearings with a tripod prismatic compass. A plane-table was used, and both traverse and detail plotted while on the ground. When dealing with boundaries as indefinite as those met with on sand cays, the use of a detail book entails a risk of loose ends and discrepancies which might not be discovered until too late. In all this work we were limited for time. A further advantage of plotting the map in the field was that with increasing practice it became possible to sketch in most of the detail accurately without pacing many offsets.

Statistics of this method collected for the fifteen cays on which it was employed yielded the following mean averages :

Length of closed traverse when plotted	15.9	inches
No. of stations	8	
Closing error	0.05	inches
Time for completed field map	2 1/4	hours

This time average often included two or three "legs" taken off the main traverse. This method is greatly superior to that of a hand compass and pacing sketch, while the time taken is little longer; it is more than sufficient for the production of a physiographical sketch of such changeable formations. It was possible to rely on the compass used to within a fraction of a degree.

Triangulation was impossible, as most of the cays were covered with brushwood or trees. In any case nearly all the features of interest were near the water's edge, and this made a traverse the best method: the random nature of the very small inaccuracies met with, is reflected in the negligible closing errors, which never exceeded one-tenth of an inch and were often nil. A scale of 100 feet to an inch was employed on all but three islands, whose large size made it necessary to adopt 100 yards to an inch. The tidal range of only a foot removed one difficulty, but was also responsible for the narrow beaches. Overhanging trees and mangroves spreading out beyond the dry land frequently made it necessary to work for long stretches in water knee-deep. The main vegetation boundaries, as well as the nature of the ground, were always shown. The conventional signs used throughout were selected from those employed by the Great Barrier Reefs Expedition of 1936.

Besides the fifteen cays surveyed with this method, certain other maps were made by similar methods modified to suit particular conditions. Three small cays were of such a size and shape that a short series of stations along the main axis was preferable to a closed traverse. Two were so small that they could be sketched from one point. Pigeon Island presented certain difficulties owing to its densely wooded shores. Twenty-nine stations had to be used to complete a traverse of nearly 2000 yards. As the inner lagoon was almost free from mangroves, it would probably have been better to have fixed that by triangulation from a measured base line, had time permitted. Most of the detail could then have been filled in by offsets or short legs from the lagoon. Salt Island could not be mapped by this or any other accurate form of ground survey, but we succeeded in making a hand compass and pacing sketch round three sides of it, nearly all the work being carried out in water 2-3 feet deep. The remainder had to be completed by boat. The position of our schooner, at anchor under the lee of the island and steady in the trade winds, was fixed by bearings taken from the land part of the island. By rowing on a given course and taking back bearings on the schooner, the traverse was closed. A ridge of deep-lying beach-rock off South-East Morant Cay also had to be fixed by taking bearings on a small boat rowed over it.

The remaining maps of the Bogue Islands and the Palisadoes were only a matter of filling in physiographical detail on, and making some revisions to, existing maps and charts.

