THE IMPORTANCE OF SEA-LEVELS CARIBBEAN ARCHAEOLOGY

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(a) CHANGES OF SEA-LEVEL & SHORELINES SINCE THE MESO-INDIAN EPOCH.

During a recent archaeological survey of Antigua it was noted that middens on the north-east coast were being eroded by the sea. Sherds were actually found encrusted with barnacles. Because of this erosion and change of sea level, the first Lesser Antillean two component site of archaic and ceramic levels was discovered and subsequently excavated (1).

On the otherhand, to the south-west of the island, middens were found up to three quarters of a mile inland. One such site, of archaic age, is at Jolly Beach (2). This is situated in a place that was once a beach now lying a few hundred yards inland. This beach lies between two limestone hills, a tombolo, which formed an ancient peninsula. A water eroded cave to the seaward side of the outer hill was the telltale of the sea's regression. This is also shown by the present day surrounding of swampland.

Other sites around the south-west shore of Antigua bear out this conclusion that the sea is regressing, as they are now lying inland and about 10 ft. above sea-leve. Since the sea-level appears to be rising on one side and lowering on the other, it could be concluded that the land mass might be tilting.

Luckily we have a carbon date for Jolly Beach of 1775 B.C. (1-7687) so we are able to calculate the approximate average rate of tilt, should this be proved so. A 10 ft. fall of sea-level in 4,000 years gives an average of one inch in 33 years.

A cause of this tilt could possibly be tectonic. Along the outer Leeward Is., the North American plate coincides with the Caribbean plate, so it is likely there is great stress and tension between them, thus causing a gradual movement, as well as the occasional earthquake.

Another cause of apparent rise on one side and apparent fall on the other side of an island could be due to the erosion and subsequent sedimentation of fine grained particles from the windward or easterly side of the island. Normally land masses erode on their windward shores, and such sediment as is swept downwind, and is not lost to sea, will accumulate on the lee side by the action of currents. Thus many lee bays and estuaries will become barred off by sand beach or barrier bars. The lagoons behind, trap sediment, and eventually through normal euthopication, end up as swamps. Antigua's changed shoreline in the last 5,000 years is probably a combination of these two causes. Look for them in your locality of interest.

The importance of sea-level change due to these types of land formation, should be realized by the archaeologist, in searching for new sites. Mainly new sites, as surface finds, will be found some distance inland whilst others nearer the shore may be buried quite deeply in sand and other sediments.

(b) CHANGES OF SEA-LEVEL DURING THE LITHIC AGE

Another type of sea-level change that could aid archaeology in tracing the earliest migrations is the eustatic change caused by the alternate melting and build up of glacial areas. It is difficult to distinguish the influence of eustatic sea-level movements from those of tectonic and isostatic movements in the determination of former levels. However in the calculation of these levels, it is customary to consider only glacial control (3), as this far overwhelms all other trends and factors such as tectonic, isostatic, sedimentation, changes in volume due to temperature, and the decanting of shallow seas due to tectonic upheavals.

The earliest Circum-Caribbean date for the presence of man thus far, is about 17,000 B.P., at which time, the eustatic sea-level was approximately 50 fathoms (300 ft.) lower than at present (4). Most of the Lithic sites and their tool assemblages, which are used comparatively for the tracing of migrations, probably lie submerged in up to 50 fathoms. The depths would vary according to which of the possible migration routes were used, and at what time.

Lithic peoples may have been water-borne. Prehistorians usually assume that Lithic peoples travel only over land, but recent finds in Australia, isolated by the sea for the last 15 million years, prove the presence of man 40,000 years ago. This indicates that the earliest Australians may have been the first seafarers (5). Evidence in the Greater Antilles shows that people of the Lithic age were living in Casimira about 7,000 years ago (6).

Earliest evidence of man in the Circum-Caribbean area is found at Muaco, Cucurucho and Taimi Taima in Venezuela, at just under 15,000 B.C., the time of the last glaciation (7). In these sites, El Jobo type points were found in association with the late Pleistocene megafauna, Mastodon and Megatherium. From this time on, until about 4,000 B.C., the sea-level rose in oscillations from 50 fathoms below the present level, to the present level.

From the accompanying maps, it can be seen that any movement over the sea by early seafarers would have been of much less distance than it is today, as there were more islands, and the present islands and continents were larger and closer together. Thus, there were no long sea passages to make to reach any of the islands

In addition, there would have been a gentle seafaring climate, as the glaciated areas reached to the present temperate latitudes, compressing the world's climatic zones (8). Thus, the Bermuda high pressure area would have been forced further south, giving the Caribbean light and variable winds.

The three main routes from the mainland to the Greater Antilles, as shown in the map, would have been 1) over the Bahama shelf to Cuba, 2) from Central America over the present continental shelf through the Mid-Caribbean archipelago, including Jamaica, to Hispaniola, and 3) from eastern Venezuela through the Lesser Antilles. Each of these routes could have been navigable until they were finally inundated about 5,000 B.C., 8,000 B.C., and 9,500 B.C. respectively.

Central American lithic sites probably lie on its continental shelf, and Jamaica's sites twelve miles south of Portland Point. Likewise, Grenada's lithic sites very likely lie near the Reindeer Shoals, about twenty miles south-west of St. George's. Hispaniola offers several lithic sites for study today, as no large low-lying areas of land were inundated after the last glaciation.

If we could obtain a flake of flint, or a stone tool, in a sedimentologist's core sample, this could help to trace the earliest migrations into the West Indies.

The material which we seek will be in the form of flint flakes, as these are the most common artifacts of lithic sites. In order to make one tool, the maker would strike off many flakes, from several nodules. The factor that will be the most useful in showing that the flake was indeed made by man will be the existence of a bulb of percussion. This forms whenever a flake is detached forcibly from a parent nodule.

According to a sedimentologist's core sample from the Gulf of Mexico (9), the ice sheet covering much of North America, underwent a sudden surge around 9,500 B.C., readvancing southward, where it quickly melted. The released water would have caused extensive flooding and raised the sea-level perhaps some tenths of metres per year. Since the sea-level was some 130 ft. lower at the start of the flooding than it is today, the isolating and submerging of early habitations would be very possible (10).

Oceanographers must be made aware, when coring for other disciplines, that at certain strategic points and depths, it might be possible to locate a Paleo-Indian or Lithic campsite, that would help us determine the origins of our preceramic cultures.

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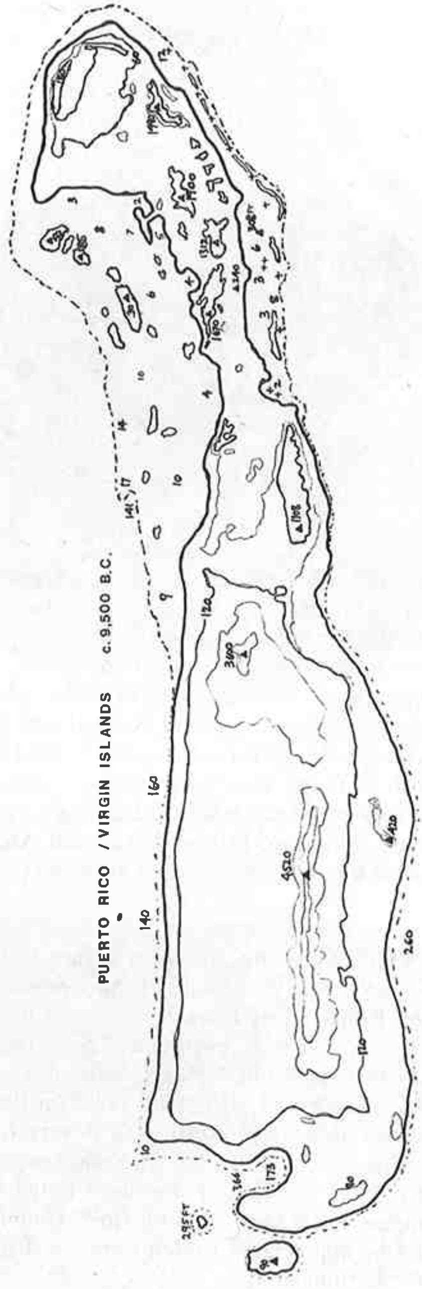
ANTIGUA / BARBUDA c.9,500 B.C.


PUERTO RICO / VIRGIN ISLANDS c. 9,500 B.C.