

FOSSIL MOLLUSCAN ASSEMBLAGES AND PALEODEPOSITIONAL ENVIRONMENTS OF QUARRY 'A', SAN SALVADOR, BAHAMAS

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INTRODUCTION

Quarry 'A' is a small quarry located in the northeastern section of San Salvador Island. In contrast to the dense vegetation which conceals most of the surrounding area, this "two-lobed" excavation provides a modest exposure of various carbonate rock units of presumed Pleistocene age. Well preserved fossil assemblages are found in these units. It is the focus of this study to present a detailed analysis concerning the fossil mollusks, particularly with respect to identifying species and assemblages in order to determine their paleodepositional environments.

FIELD AND LABORATORY INVESTIGATIONS

Field investigations started with making a tape-and-compass map of the quarry floor. Three stratigraphic profiles, at different locations in Quarry 'A', also were measured and described. Sample collections of the mollusk fossils were made from the different rock units. However, the bulk of the samples came from the fossiliferous unit which constitutes the base of the quarry; lack of properly exposed collection sites is the main reason for this bias in field collecting methodology.

The first step in laboratory work, which is still in progress, is identification of the mollusk species. To date, approximately thirty species of bivalves and gastropods have been identified. The next stage will be to determine the relative abundance of each species to facilitate recognition of assemblages in each unit. Since depositional mechanisms are known to alter the state of communities, the mollusk assemblages will be analysed to see if one or more communities are present and to indicate paleodepositional environments.

STRATIGRAPHY

Of the three stratigraphic sections measured during the field season, Section B (Fig. 1), which is located in the southern lobe of Quarry 'A', is included as a representative rock profile. This in no way implies that all rock units or related environments of Quarry 'A' are represented in Section B. It needs also to be noted that the thickness of a given unit is not uniform throughout the quarry; rather thickness varies with changes in topography.

The base of Section B extends upward about 15 cms and is composed of fine to medium calcareous sand. Although the overlying unit is mostly covered by talus from the quarry excavations, its vertical dimension recognizably extends to about 129 cms. Tan-colored micritic rock fragments and pebbles, including a few black pebbles, form most of the constituents of the breccia at the base of this unit. The rest of the unit is mainly micritized shelly calcarenite with coral fragments, mollusks, bryozoans, calcareous algae, and calcareous sand. An eolianite (125 cms) capped by a thin layer of caliche completes the section.

STRATIGRAPHIC SECTION 'B'

QUARRY 'A'

SAN SALVADOR, BAHAMAS

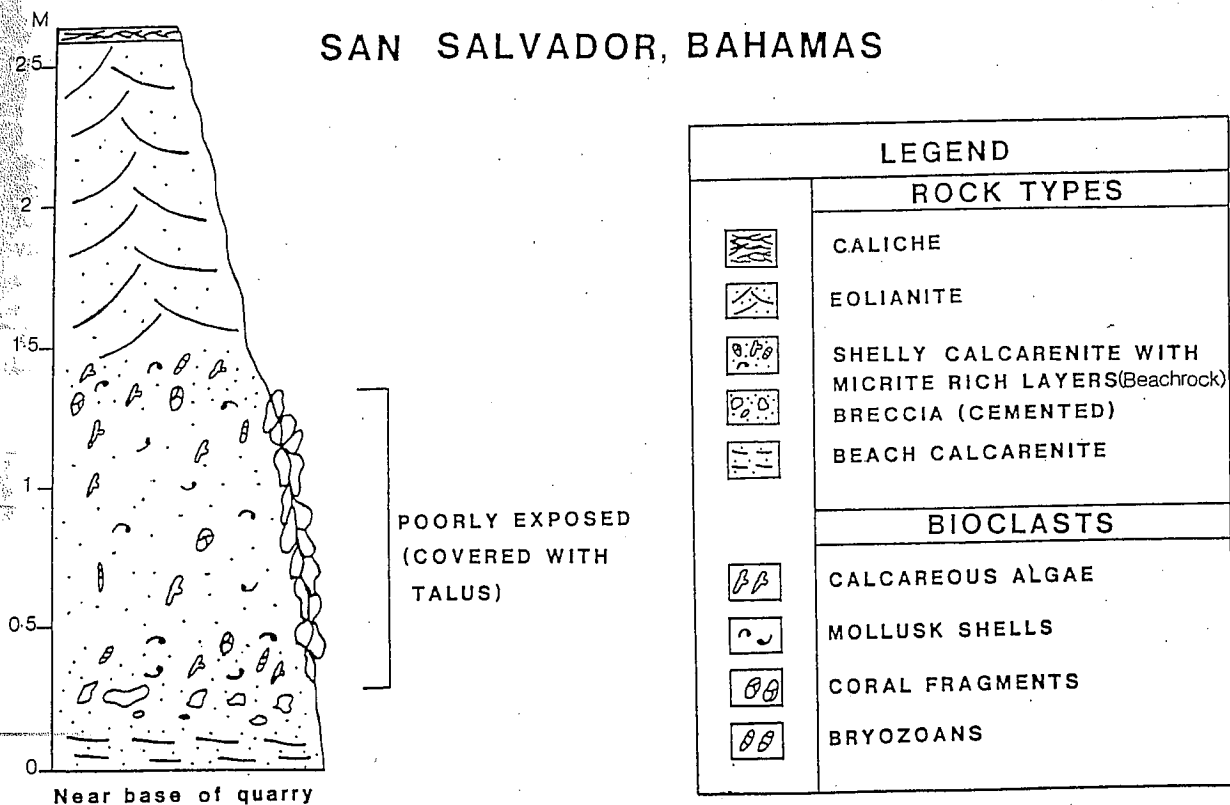


Figure 1. Measured stratigraphic section B in Quarry 'A'.

DISCUSSION

Overall, the basal unit of Quarry 'A', contains very shelly material in the northern lobe, whereas isolated in situ corals (mostly *Diploria sp.*) are found in the southern lobe. This basal unit has been interpreted as of subtidal origin (Bain, 1985 and 1989). A very shelly, somewhat micritized layer lies above the subtidal material. The fossil assemblages identified as rocky bottom fauna, together with several other lines of evidence, led Bain (1985 and 1989) to suggest a colonized beachrock origin. A dune environment is recognized from the eolianite layer which tops the sequence. Hence, the Quarry 'A' stratigraphic column has been interpreted to represent a regressive "subtidal-beach-dune" sequence (Bain, 1985). Data from the fossil mollusk assemblages now under study may help to define better the paleodepositional environments represented.

REFERENCES

- Bain, R.J., 1985, Subtidal - Beach - Dune sequence, Quarry 'A', in Curran, H.A. (ed.), Pleistocene and Holocene Carbonate Environments on San Salvador Island, Bahamas - Guidebook for Geological Society of America, Orlando annual meeting field trip #2: San Salvador, Bahamas, CCFL Bahamian Field Station, pp. 63-71.
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