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## Results of the Puritan-American Museum of Natural History Expedition to Western Mexico

### 11. Pleistocene Invertebrates from Ceralvo Island

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#### INTRODUCTION

The author collected a small number of Pleistocene invertebrates, mostly mollusks, from terrace deposits on the southern end of Ceralvo Island, Baja California, during the expedition's brief visit to the island.<sup>2</sup> Although megafossils of this age are known from the adjacent part of the peninsula and from some of the more northern islands in the Gulf of California, this is the first report of Pleistocene fossils from Ceralvo Island. Hanna and Hertlein (1927) and Hertlein (1957) record the presence of Pliocene megafossils from the west side of the island.

Ceralvo Island, the southernmost of the near-shore islands off the eastern coast of Baja California, is separated from the mainland by a narrow channel with depths of less than 200 fathoms. It is a nearly barren, arid island of bold relief. According to Beal (1948), the island block has a pre-Tertiary origin of igneous rocks that form at the present time a single mountain range, with elevations greater than 2500 feet above sea level, extending in a northwest-southeast direction

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<sup>2</sup> For the itinerary of the expedition, see Emerson (1958).

for about 30 kilometers. The island is reported to be composed largely of coarsely crystalline, greenish white, granitic rocks.

The eastern and western sides of the island consist of a succession of steep cliffs, with small intervening stretches of cobble beaches. On the southern end of the island, however, where the present collections were made, a narrow rocky beach is present below the cliff.

#### ACKNOWLEDGMENTS

The writer is indebted to Dr. Leo George Hertlein and Dr. Donald F. Squires for identifying certain of the fossils and to Dr. Brian H. Mason for identifying a rock sample.

#### LOCALITY DESCRIPTION

The fossils were collected from coarse yellowish sand and pebbles, locally conglomeratic with boulders and *Porites* heads, from a nearly continuous narrow terrace deposit, exposed 5 to 12 feet above the high-tide line, bordering the granitic sea cliffs on the south side of the island (fig. 1). Along the beach the fossiliferous deposit overlies the igneous rock with an angular unconformity at an elevation of about 5 feet above the present high tide, and the marine sediments are covered with 0 to 20 feet of non-fossiliferous conglomerate, sand, and soil. An exposure in one of the small arroyos shows the top of the fossiliferous deposit to abut against the igneous rocks at an elevation of about 14 feet.

Wang (1959), in a brief review of the origins of coastal terraces, refers to the "Cerralbo Island terrace" as an example of an "elevated coastal fluvial terrace." He states that the "terrace is 10 m high with 6 m of fan gravel on the top, 2.5 m of a marine fossiliferous bed in the middle of a beveled bed-rock platform about 1.5 m above the present wave-cut notch." This suggests a rise in sea level of about 13 to 19 feet. Wang's figures are in essential agreement with the field observations presented above for the present collecting locality.

#### FAUNAL CONSIDERATIONS

The collected fauna totals 34 marine species of metazoan invertebrates: two stony corals, 13 gastropods, and 19 pelecypods (see below for a list of the species). All the recognized species live at the present time in shallow waters of the Gulf of California region.

The collection is obviously only a small portion of the molluscan fauna that lived in the area at the time of deposition. The gastropods

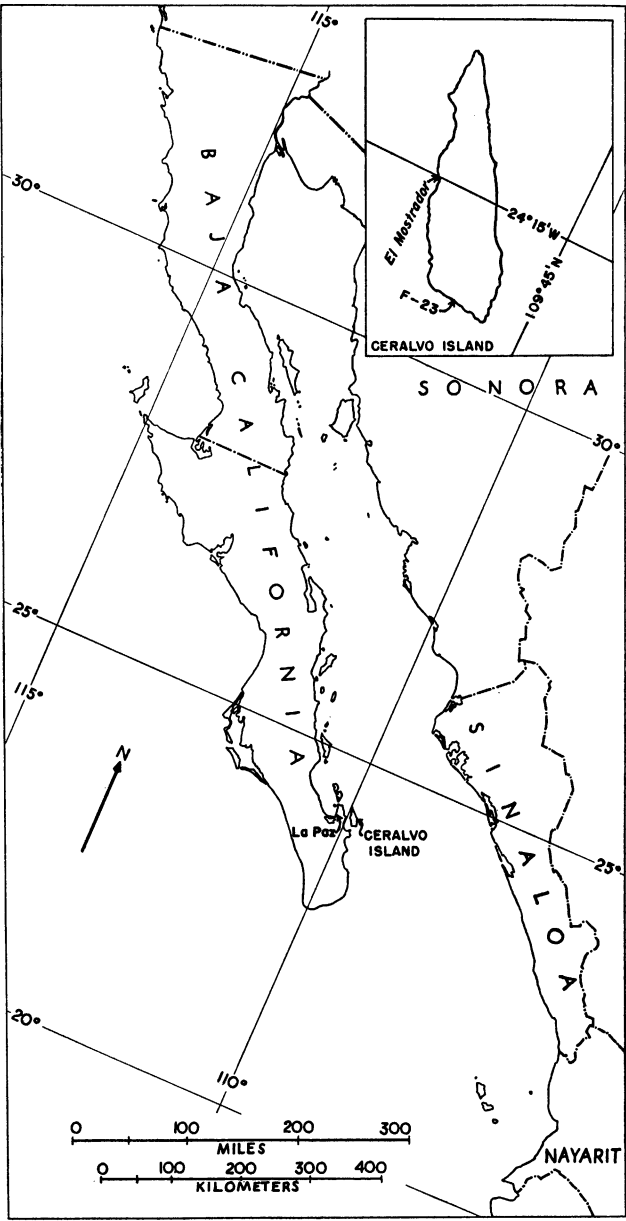


FIG. 1. Northwestern Mexico, indicating location of Cerralvo Island and La Paz, Baja California, with enlarged map of Cerralvo Island to show location of Pleistocene terrace fauna (locality F-23) described in text.

are poorly preserved and are represented by fewer species than the generally better preserved pelecypods. Paired valves of two of the pelecypods (*Chione undatella* and *Codakia distinguenda*) are common in the deposit. Differential leaching of fossils also has been noted elsewhere in this arid region by Jordan and Hertlein (1926), Durham (1950), and Hertlein and Emerson (1956).

Heads of *Porites* and large specimens of *Strombus galeatus* and *Spondylus calcifer* occur commonly in the conglomerate, whereas faunal elements of smaller size, such as *Anadara*, *Chione*, *Pecten*, and *Lyropecten*, are more abundant in the sandstone facies. Such occurrence suggests that most of the non-attaching elements of the fauna represent a mixed death assemblage carried by currents and wave action from adjacent shallow-water habitats and deposited near the fore-edge of the terrace platform. Similar assemblages are recorded by Hertlein (1957) from terrace deposits, reported to be 20 to 30 feet in elevation, in the nearby coastal region of La Paz, Baja California. Other deposits from low emergent terraces carrying a typically modern Panamic fauna are known elsewhere in the Gulf of California region from near the head of the Gulf (Hertlein and Emerson, 1956) southward to La Paz. These faunas are considered to be Pleistocene in age.

On the basis of the physiographic and faunal evidence, the fossiliferous sediments on the Cerralvo Island terrace are referred to a late Pleistocene age. All the faunal constituents are extant forms, and the sediments are deposited on the platform of the lowest emergent terrace in the local area.

Brief mention should be made of the occurrence of Pliocene deposits on the west side of Cerralvo Island, near Ruffo Ranch, south of El Mostrador, reported by Hanna and Hertlein (1927) and Hertlein (1957). According to Dr. G. Dallas Hanna (*in litt.*) these beds (California Academy of Sciences locality 34033) are several hundred feet thick, folded or faulted, and extremely hard. The Pliocene age assignment is based largely on the presence in one of the collections (Hertlein, 1957) of *Aequipecten (Plagioctenium) abietis* (Jordan and Hertlein, 1926), a Pliocene species that is not known to occur in beds younger than late Pliocene (Durham, 1950). In addition to the extinct *Aequipecten*, only seven other identified species of megafossils are recorded from the two collections. Of this number, all are species comprising the modern Panamic fauna, and all but one occur in the Pleistocene terrace fauna of Cerralvo Island.

The list of the Pleistocene fossils collected from the south side of Cerralvo Island, at locality F-23, is as follows:

## MOLLUSCA

## GASTROPODA

- Acmaea* cf. *A. atrata* Carpenter, 1857  
*Astraea* (*Uvanilla*) *unguis* (Wood, 1828)  
*Nerita* (*Ritena*) *scabricosta* Lamarck, 1822  
*Cerithium* cf. *C. maculosum* Kierner, 1841, one fragment  
*Cypraea* (*Zonaria*) *annettae* Dall, 1909  
*Strombus* *granulatus* Swainson, 1822  
*Strombus* *galeatus* Swainson, 1823  
*Cassis* (*Levenia*) *coarctata* Sowerby, 1825  
*Cassis* (*Semicassis*) *centiquadrata* (Valenciennes, 1832), juvenile  
*Muricanthus* aff. *M. nigrinus* (Philippi, 1845), one fragment  
*Fasciolaria* (*Pleuroploca*) *princeps* Sowerby, 1825  
*Oliva* (*Oliva*) *spicata* (Röding, 1798)  
*Conus* (*Conus*) aff. *C. princeps* Linnaeus, 1758

## PELECYPODA

- Anadara* (*Larkinia*) *multicostata* (Sowerby, 1833)  
*Glycymeris* (*Axinactis*) *delesserti* (Reeve, 1843)  
*Glycymeris* (*Glycymeris*) *gigantea* (Reeve, 1843)  
*Glycymeris* (*Glycymeris*) *multicostata* (Sowerby, 1833)  
*Pinctada* *mazatlanica* (Hanley, 1856)  
*Ostrea* *angelica* Rochebrune, 1895<sup>1</sup>  
*Pecten* (*Pecten*) *vogdesi* Arnold, 1906  
*Aequipecten* (*Plagiectenium*) *circularis circularis* (Sowerby, 1835)<sup>1</sup>  
*Lyropecten* (*Lyropecten*) *subnodosus* (Sowerby, 1835)  
*Lima* (*Lima*) *tetrica* Gould, 1851  
*Spondylus* *princeps* Broderip, 1833  
*Spondylus* *calcifer* Carpenter, 1856  
*Placunanomia* *cumingi* Broderip, 1832  
*Cardita* *megastropa* (Gray, 1825)  
*Codakia* *distinguenda* (Tryon, 1872)  
*Pseudochama* sp.  
*Trachycardium* (*Trachycardium*) *consors* (Sowerby, 1833)  
*Megapitaria* *squalida* (Sowerby, 1835)  
*Chione* (*Chione*) *undatella* (Sowerby, 1835)

## COELENTERATA

HEXACORALLIA<sup>2</sup>

- Pocillopora elegans* Dana, 1846  
*Porites* sp.

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<sup>1</sup> Identification kindly corroborated by Dr. L. G. Hertlein.

<sup>2</sup> Identifications courtesy of Dr. D. F. Squires.

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