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MOLLUSKS OF LATEST CRETACEOUS AND PALEOCENE AGE, LAKE NACIMIENTO, CALIFORNIA

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ABSTRACT

Mollusks from the vicinity of Lake Nacimiento, San Luis Obispo County, California, range in age from early late Maastrichtian through early Paleocene. The mollusks are predominantly of shallow-water aspect, although some may have been deposited in water deeper than that they inhabited. The faunas of early late Maastrichtian and later Maastrichtian age from Cantinas Creek and the north shore of Lake Nacimiento largely comprise genera endemic to the North Pacific. The Dip Creek fauna of latest Maastrichtian (and possibly earliest Paleocene) age contains a larger component of genera not found in earlier West Coast faunas. Some of these forms appear to be most closely related to Western Interior and Gulf Coast genera. Additionally, at least a third of the Dip Creek fauna, which is considered to be of Maastrichtian age because of an included ammonite, comprises taxa of Paleocene age. Southeast of Dip Creek along the ridge west of Godfrey Road, a late early Paleocene fauna has been recognized in strata that overlie the Dip Creek beds.

INTRODUCTION

Fossil mollusks of the Nacimiento Lake area (Figure 1) have proven to be very useful for determining age of the strata and for correlating with other sections of latest Cretaceous age. At most Lake Nacimiento area localities, turrnellas are the most abundant form, and at some, as along Dip Creek, turrnellas dominate the fauna. The more common turrnellas species at Dip Creek was described by Merriam (1941) as *Turrnellas pachecoensis adalaidana*, and the strata there were assigned a Paleocene age (Taliaferro, 1944). Verastegui (1953) recognized that the *Venericardia* from the Dip Creek strata was not *V. (Venericor) venturaensis* WARING, 1917, and named it *V. (Pacifcor) taliaferroi*. The turrnellas of the area were restudied by Saul (1983a). The Dip Creek turrnellas were assigned to *Turrnellas peninsularis adalaidana* MERRIAM, 1941, and *Turrnellas webbi* SAUL, 1983. Turrnellas from underlying strata on the north side of Lake Nacimiento are *T. chanevi orienda* SAUL, 1983, and *T. webbi paynei* SAUL, 1983; and those farther down section at Cantinas Creek are *T. chanevi* intergrades to *T. c. orienda* and *T. webbi paynei* SAUL, 1983. From the ridgetop west of Godfrey Road, Addicott (*in* Durham, 1974, *in* Howell et al. 1977) identified *T. infragranulata* GABB, 1864, and assigned a Paleocene age to these beds that overlie the Dip Creek-Nacimiento strata. Saul (1983a) has suggested that these turrnellas might instead be *T. peninsularis* ANDERSON & HANNA, 1935, which would indicate a mid Paleocene rather than late Paleocene age, but the specimens should be restudied. Turrnellas correlative with those from Cantinas Creek are found at the top of the Garzas beds of the Moreno Formation along the west side of the Diablo Range, Stanislaus and Merced Counties. The turrnellas from the north shore of Lake Nacimiento correlate with the basal San Francisquito Formation on Warm Springs Mountain, Los Angeles County (Saul, 1983a). Those from the Dip Creek outcrops are also found above the base of the San Francisquito Formation on Warm Springs Mountain and on Machesna Mountain, San Luis Obispo County (Saul, 1983a). The Godfrey Road turrnellas are undoubtedly of Paleocene age, "Martinez" Stage.

West Coast bivalves and gastropods from the latest Cretaceous stage, the Maastrichtian, are poorly documented in the literature and more than half of the species remain undescribed. Nearly all described West Coast Paleocene mollusks are from the "Martinez" Stage, which is approximately equivalent to Foraminiferal Zones P3 - P5 (Saul, 1983b). Lake Nacimiento area molluscan taxa are mainly of Maastrichtian and possibly earliest Paleocene age, and little useful data regarding these taxa is available in print. Distributions and abundances of Lake Nacimiento mollusks elsewhere are from comparisons with those from other West Coast localities, primarily collections housed at the Natural History Museum of Los Angeles County.

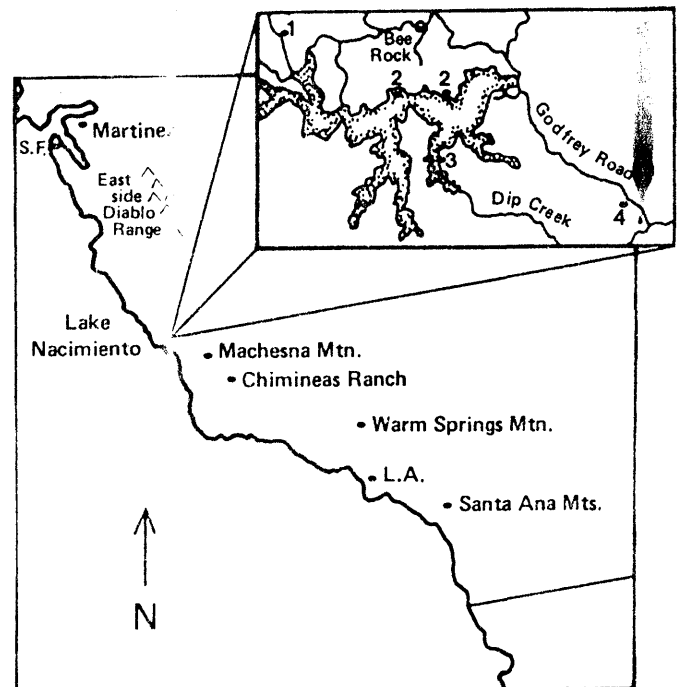


Fig. 1. Geographic reference map. Locations of California sections having molluscan faunas similar to those of the Lake Nacimiento area. Lake Nacimiento area localities discussed are: 1) Cantinas Creek, 2) north shore of Lake Nacimiento, 3) Dip Creek, and 4) ridge west of Godfrey Road.

CANTINAS CREEK

Over several summers in the 1930's, N. L. Taliaferro, his associates, and students collected small lots of fossils from numerous localities in the Adelaida, Bradley, Bryson, and Cape San Martin Quadrangles, southern Santa Lucia Range, California. Taliaferro (1941, p. 502) published a list of 24 genera from these localities; at least two-thirds of those listed probably refer to forms found at Cantinas Creek, Bryson Quadrangle. The specimens were identified by Alex Clark, B. L. Clark, H. G. Schenck, and C. W. Merriam, and the resultant list contains redundant names and includes fossils of different ages. Recently more voluminous collections by V. M. Seiders, K. G.

Provine, R. B. Saul, and L. R. Saul have made reassessments of the identifications and better correlations possible.

Coralliochama cf. *C. orcutti* WHITE, 1896, is from a locality in the Cape San Martin Quadrangle and suggests shallower water than other forms listed by Taliaferro or found at Cantinas Creek. Most occurrences of *C. orcutti* are of early Maastrichtian age and somewhat older than that of the Cantinas Creek beds.

A reworked fossiliferous boulder collected by V. M. Seiders from a conglomerate that crops out west of the Pebblestone Shut-in, has reluctantly yielded specimens suggestive of a Late Campanian age. *Opis* n. sp. aff. *O. triangulata* (COOPER, 1894) is common in this clast as is *Calva bowersiana* (COOPER, 1894); both are found in Campanian strata of the Santa Ana Mountains in Orange County, and the strata from which the boulder was derived are older than the Cantinas Creek beds. A similar clast may have provided the *Opis* cited in Taliaferro's list.

The mollusks of the Cantinas Creek locality (see also Seiders, this volume) are of early late Maastrichtian age. Fossils found at Cantinas Creek localities include:

Acila sp.

Indogrammatodon cf. *I. vancouverensis* (MEEK, 1858).

Figures 2 - 4. The genus is typical of fine-grained sediment throughout the West Coast Cretaceous.

Glycymeris (Glycymerita) banosensis ANDERSON, 1958.

Figures 5 - 6. This species is abundant in the Garzas beds of the Moreno Formation along the east side of the Diablo Range, Stanislaus and Merced Counties. It ranges from early through mid late, but apparently not into the latest Maastrichtian. Its sharp topped ribs distinguish it from *G. (G.) veatchii* (GABB, 1864), the ribs of which are flat topped.

Brachidontes n. sp. A similar form occurs in the Moreno Formation on the west side of the Diablo Range

Pycnodonte sp. An off-shore oyster.

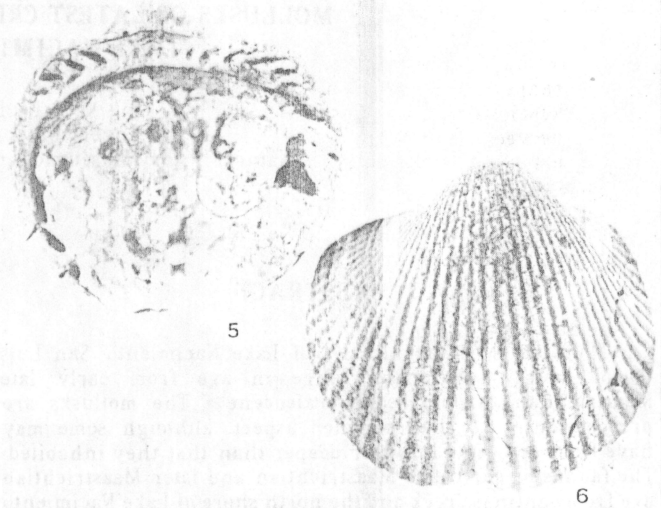
Anomia sp.

Clisocolus aff. *C. dubius* (GABB, 1864). The genus ranges from Turonian through Maastrichtian on the West Coast and is present in the Western Interior Maastrichtian (Speden, 1970). A Japanese species of similar age is placed in the subgenus *Crenocolus* (Hayami, 1975). All are round and very inflated.

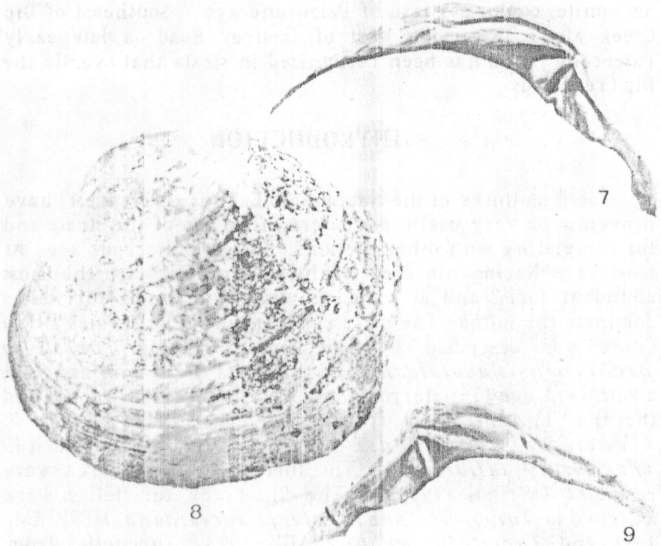
Crassatella mercedensis ANDERSON, 1958. Figures 24 - 27.

Calva varians (GABB, 1864). Figures 7 - 9. The species is of Maastrichtian age and has been found near the top of the Great Valley Series near Martinez, Contra Costa County and in the Garzas beds of the Moreno Formation, east side of the Diablo Range.

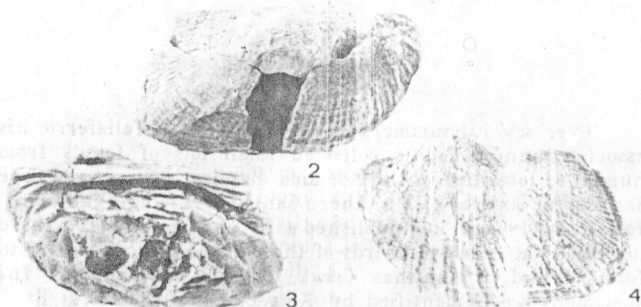
Aphrodina? cf. *A. ? fragilis* (GABB, 1864). Figures 10 - 11. This species is also present in the Moreno Formation along the east side of the Diablo Range and at Martinez, Contra Costa County. The genus may be undescribed. The species is congeneric with *A. ? arata* (GABB) of Turonian age.



Figs 5-6. *Glycymeris (Glycymerita) banosensis* ANDERSON, 1958; x 1, LACMIP 7548; LACMIP loc. 9196, Cantinas Creek, Bryson Quad.



Figs 7-9. *Calva varians* (GABB, 1864); x 1; UCB loc. A-3369, 1/2 mi. west of Bee Rock Road, Tierra Redonda Quad.; 7-8. UCBMP 38029; 9. UCBMP 38030.



Figs. 2-4. *Indogrammatodon* aff. *I. vancouverensis* (MEEK, 1858); x 1; LACMIP loc. 9196, Cantinas Creek, Bryson Quad.; 2-3. LACMIP 7546; 4. LACMIP 7547.



Figs. 10-11. *Aphrodina?* cf. *A. ? fragilis* (GABB, 1864); x 1; LACMIP 7549; LACMIP loc. 9196, Cantinas Creek, Bryson Quad.