

REPORT ON PLEISTOCENE MOLLUSCAN FAUNA AT CAPISTRANO BEACH, ORANGE COUNTY, CALIF.

By G. WILLET

A few months ago Mr. Don W. Leyden, of Doheny Park, Calif., reported to the Los Angeles Museum that numerous fossil invertebrates had been exposed during grading work on a real estate subdivision at Capistrano Beach, Orange County, Calif. In order to obtain information on the character of this exposure, the writer and his wife, accompanied by Mr. Leyden, visited the locality on September 20-21, 1937. It was found to be approximately one-half mile back from the present beach, at an altitude of about 150 feet. The fossiliferous vein, a foot or more in depth, was on the slope of a hill and covered by 10 to 12 inches of clay. Below the vein was brown sand of an undetermined depth.

We occupied the larger part of two days excavating and screening and brought back about 400 pounds of screenings, which were sorted at the museum. From this material nearly 5,000 specimens of mollusks, of 153 species, were preserved.

A study of the species indicates a shallow water assemblage, probably of less than 5 fathoms. That the water was colder than it is in the same region today appears to be demonstrated by the occurrence of such species as *Cardium corbis* (Mart), *Pseudomelatoma torosa* (Cpr.), *Olivella pedroana* (Conr.), *Tritonalia subangulata* (Stearns), *Bittium ornatissimum* Bartsch, and *Diadora aspera* (Esch.). To find these species in shallow water at the present time, it would be necessary to go north to some point between Point Conception and Monterey. Considering this, it would appear that the Capistrano Beach deposit is referable to the Lower San Pedro series of the Pleistocene.

As this locality has not been reported on previously, the identified species are listed below, the most abundant being marked with an asterisk.

* <i>Leda taphria</i> Dall.	<i>Lucina californica</i> Conr.
<i>Yoldia cooperi</i> Gabb.	<i>Taras orbellus</i> (Gld.).
<i>Philobrya setosa</i> (Cpr.).	<i>Rochefortia tumida</i> (Cpr.).
* <i>Ostrea lurida</i> Cpr.	<i>Rochefortia aleutica</i> (Dall).
<i>Pecten hindsi</i> Cpr.	<i>Chironia subauricularis</i>
<i>Pecten hericeus</i> Gld.	(Mont.).
* <i>Pecten latiauritus</i> Conr.	<i>Cardium substriatum</i> Conr.
<i>Septifer bifurcatus</i> (Conr.).	<i>Cardium quadragenarium</i>
<i>Modiolus modiolus</i> (Lin.).	Conr.
* <i>Glans carpenteri</i> Lamy.	<i>Cardium corbis</i> (Mart.).
* <i>Lucina nuttallii</i> Conr.	* <i>Venerupis tenerrima</i> (Cpr.).

- Venerupis staminea (Conr.).
 *Tranzenella tantilla (Gld.).
 Tivela stultorum (Mawe).
 *Petricola carditoides (Conr.).
 Tellina bodegensis Hds.
 Tellina buttoni Dall.
 *Macoma inquinata Desh.
 Macoma indentata Cpr.
 Macoma cf. quadrana Dall.
 Semele rubropicta Dall.
 Cumingia lamellosa Sby.
 *Donax gouldi Dall.
 Solen sicarius Gld.
 Ensis californicus Dall.
 Siliqua lucida (Conr.).
 *Platyodon cancellatus
 (Conr.).
 Schizothaerus nuttallii
 (Conr.).
 Cryptomya californica
 (Conr.).
 Zirfaea pilsbryi Lowe.
 Pholadidea penita (Conr.).
 Pholadidea parva Tryon.
 Dentalium pretiosum Sby.
 *Dentalium neohexagonum
 S. and P.
 Acteon punctocaelatus
 (Cpr.).
 Retusa harpa Desh.
 Retusa culcitella (Gld.).
 Conus californicus Hds.
 Moniliopsis incisa (Cpr.).
 Pseudomelatoma torosa
 (Cpr.).
 Clavus hemphilli (Sts.).
 Mangelia merita (Hds.).
 Mangelia interlirata (Sts.).
 *Mangelia variegata Cpr.
 Mangelia aspera (Cpr.).
 Clathurella conradiana Gabb.
 *Olivella buplicata (Sby.).
 *Olivella pedroana (Conr.).
 Hyalina jewettii (Cpr.).
 Hyalina subtrigona (Cpr.).
 Cypraeolina pyriformis
 (Cpr.).
 Fusinus arnoldi Cossman.
 Nassa cooperi Fbs.
 Nassa fossata Gld.
 Nassa perpinguis Hds.
- *Columbella carinata Hds.
 Columbella tuberosa Cpr.
 Amphissa versicolor Dall.
 Tritonalia cf. squamulifera
 (Cpr.).
 Tritonalia subangulata (Sts.).
 Tritonalia interfossa (Cpr.).
 *Acanthina spirata (Blain.).
 Erato vitellina Hds.
 Bittium catalinensis Bartsch.
 *Bittium rugatum Cpr.
 Bittium interfossum Cpr.
 Bittium attenuatum Cpr.
 *Bittium ornatissimum
 Bartsch.
 *Seila montereyensis Bartsch.
 Cerithiopsis antemunda
 Bartsch.
 Cerithiopsis pedroana
 Bartsch.
 Cerithiopsis antefilosa
 Bartsch.
 *Cerithiopsis cosmia Bartsch.
 Metaxia diadema Bartsch.
 *Triphora pedroana Bartsch.
 Rissoina kelseyi Dall.
 Turritella cooperi Cpr.
 Aletes squamigerus Cpr.
 Petaloconchus complicatus
 Dall.
 Micranellum crebricinctum
 (Cpr.).
 Fartulum occidentale
 Bartsch.
 Littorina scutulata Gld.
 Lacuna unifasciata Cpr.
 *Lacuna marmorata Dall.
 Hipponix tumens Cpr.
 Hipponix antiquatus (Lin.).
 Crepidula onyx Sby.
 Crepidula excavata (Brod.).
 *Crepidula lingulata Gld.
 Crepidula nummaria Gld.
 Polinices lewisii (Gld.).
 Polinices reclusianus altus
 Dall.
 Acmaea cf. cassis Esch.
 Acmaea paleacea Gld.
 Acmaea inessa (Hds.).
 *Phasianella pulloides Cpr.
 Leptothyra carpenteri Pils.

- Leptothyra paucicostata* Dall.
Halistylus pupoideus (Cpr.).
Tegula gallina (Fbs.).
Tegula montereyi (Kiener).
 **Calliostoma canaliculatum*
 (Mart.).
Calliostoma costatum
 (Mart.).
Calliostoma tricolor Gabb.
Calliostoma supragranosum
 Cpr.
Calliostoma annulatum Mart.
Margarites parcipictus Cpr.
Vitrinella stearnsi Bartsch.
Fissurella volcano Rve.
 **Diadora aspera* (Esch.).
Diadora murina (Dall).
 **Megatebennus bimaculatus*
 Dall.
Opalia evicta DeB.
 **Epitonium tinctum* (Cpr.).
Melanella micans (Cpr.).
 **Melanella thersites* (Cpr.).
Turbonilla attrita D. and B.
Turbonilla asser D. and B.
Turbonilla pecora T. S.
 Oldroyd.
Turbonilla styliana Cpr.
Turbonilla cf. berryi
 D. and B.
Turbonilla lowei D. and B.
- **Turbonilla halistrepia*
 D. and B.
Turbonilla valdezi
 D. and B.
Turbonilla chocolata Cpr.
Turbonilla halia D. and B.
Turbonilla almo D. and B.
Turbonilla tridentata (Cpr.).
Odostomia turricula
 D. and B.
Odostomia cf. nota
 D. and B.
 **Odostomia donilla*
 D. and B.
Oldroydia percrassa Dall.
Nuttallina californica (Rve.).
Ischnochiton magdalenensis
 (Hds.).
Ischnochiton radians Cpr.
 **Ischnochiton decipiens* Cpr.
Chaetopleura gemma Cpr.
 **Callistochiton palmulatus*
 Cpr.
 **Callistochiton crassicosatus*
 Pils.
Mopalia muscosa (Gld.).
Mopalia lignosa (Gld.).
Mopalia ciliata (Sby.).
Placiphorella velata Cpr.
Gyraulus vermicularis
 (Gld.).



BEES COLLECTED BY MR. AND MRS. J. L. SPERRY
 AND MR. R. H. ANDREWS IN ARIZONA

By T. D. A. COCKERELL

ANTHOPHORIDAE

CLISODON TERMINALIS SPERRYI n. subsp.

Male more robust, with the long hair of face and upper part of thorax bright reddish-fulvous, the thorax above with only a few inconspicuous dark hairs on disc; abdominal hair-bands