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NEW CALIFORNIAN PLEISTOCENE EULIMIDAE

By

S. Stillman Berry
Redlands, California

July 7, 1954

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NEW CALIFORNIAN PLEISTOCENE EULIMIDAE

by S. STILLMAN BERRY

Redlands, California

INTRODUCTION

Two exposures in the San Pedro area and immediately adjacent regions are particularly rich in species of the family Eulimidae. These are the Lomita formation formerly exposed at Hilltop Quarry, which for the present I tentatively refer to the extreme base of the Pleistocene, and the upper Pleistocene of Long Wharf Canyon, Santa Monica, which must lie well toward the top of the section. Both faunules seem representative of more austral conditions than prevail in our latitude at present, finding their nearest living parallels well down the coast of Lower California. Despite the possession of this common tendency their respective lists of Eulimidae are of quite different character.

At Hilltop Quarry shells of this family are infrequent and incomplete in occurrence in the coarse marl of the main deposit formerly exposed in the Quarry floor, only a single species being at all common there in good condition. Most of the fine-grained upper portion of the deposit is poor in macrofossils to ordinary examination, and it was not until I resorted to systematic screening with a fine mesh that the interesting and varied representation of Eulimidae in these upper beds began to be suspected. Subsequently the series so obtained was greatly enriched from siftings of a peculiarly rich shelly pocket in these beds excavated by Mr. Emery P. Chace. The study of all this has led to the preparation of the present paper as its initial result.

The material from Santa Monica was collected and given to me some years ago by the late Dr. F. C. Clark. It had already been partially worked up by me and is included here not only because of its intrinsic interest, but for the interesting comparisons thus made possible.

Comparison is simplified if the species thus far segregated are listed in separate columns.

Hilltop Quarry

- Balcis* (*Balcis*) aff. *micans* (Carpenter)
- " (") cf. *rutila* (Carpenter)
- " (") aff. *rutila* (Carpenter)
- * " (") *tersa*, n.sp.

- Balcis (Vitreolina) thersites* (Carpenter)
 * " (") *incallida*, n.sp. ✓
 " (") cf. *prefalcata* Bartsch
 * " (") *obstipa*, n.s.p. ✓
 * " (") *ebriconus*, n.sp. ✓

Long Wharf Canyon

- Balcis (Balcis) micans* (Carpenter)
 " (") *rutila* (Carpenter)
 * " (") *monicensis* (Bartsch)
 " (") *compacta* (Carpenter)
 * " (") *clavella*, n.sp.
 " (*Vitreolina*) cf. *thersites* (Carpenter)
 " (") sp. indet.
 " (") sp. indet.
 " (") *cosmia* (Bartsch)
 " (") *loleta* (Jordan)
 * *Eulima raymondi* Rivers

* Known only from horizon noted.

It will be noted that not more than three species can be recognized as common to the two formations, *Balcis micans*, *B. rutila*, and *B. thersites*, and there appears to exist a possible question respecting each of these. Four members of the list from Hilltop Quarry and one from Long Wharf Canyon have not been recognized amongst any species hitherto named, either Recent or fossil, and are accordingly described herein as new. It is further of considerable interest to note that four species from Hilltop Quarry (all but one of those for which precise determination is ventured) and three of those from Long Wharf Canyon are as yet unknown in our collections save from their type localities. One species, providing that my identification of *B. loleta* is well-advised, is known elsewhere only from the Pleistocene of San Quintin Bay. I feel, however, that it is much too early to assume that any of these are now actually extinct, as it may well be that exploration of the offshore fauna at proper depths off the coast of Lower California will reveal that most or all of them are still living at appropriate latitudes. If the same forms are still extant then the more crucial difference between the two listed faunules may turn out to be not so much one of time, considerable though it be, as of bathymetry.

Current local usage of generic names in this family for the last quarter century has been principally governed by the pronouncements of Bartsch (1917). However, Winckworth (1934: 12-13) has outlined grounds for quite a different arrangement, in the course of which he rejects *Melanella* Bowdich, 1822, because of serious question as to the generic and familial affinities of its type-species. He shows that *Strombiformis* da Costa 1778 is not susceptible to its interpretation by Iredale (1915:292-293; 1915a: 344) but must be defined in the light of the prior type designation by Harris in 1894 (Proc. Malac. Soc. Lond., 1:31), which designation entirely eliminates it from consideration as an eulimid. As Winckworth appears to ground his argument too strongly for successful assault from the bastion of evidence at present available, we can hardly refuse to follow him. This compels abandonment of *Melanella* and its replacement for the greater number of our commoner species by *Balcis* Leach, 1847, under which Winckworth suggests *Vitreolina* Monterosato as a tentative subgenus to cover the species with arcuate spires. One happy result of all this is the restoration of *Eulima* Risso, 1826, which replaces *Strombiformis* Iredale, *non* da Costa, in a conception only slightly at variance with classical usage, thus *ipse facto* restoring the old family name Eulimidae, whatever the fate of *Melanella*.

I am naming as new at the present time no species of which I have less than five specimens. Several of those still undetermined and represented by only a specimen or two may likewise eventually prove to be undescribed, or they may tie in with some named species among which there are several as yet not too well understood.

I am deeply grateful to Dr. Paul Bartsch and the United States National Museum for a number of important specimens inclusive of several paratypes, which have been of inestimable value in crucial comparisons, and to Mr. Emery P. Chace and the late Dr. F. C. Clark for the kind assistance already acknowledged.

SYSTEMATIC DESCRIPTIONS

Balcis (*Balcis*) *clavella*, new species.

Pl. 1, figs. 1, 2

Description.—Shell fairly large for the group, solid, heavy, smooth, with a stout, evenly tapering, almost straight-sided spire. Whorls in excess of 10 (apical ones missing in all shells seen), almost flat to the body whorl, which is little produced and rounds out strongly to the base, its periphery subangulate in front of the lip, and this angulation likewise

evident on the penultimate whorl of some specimens just posterior to the distinct and narrowly impressed suture. Base obtusely rounded, little produced. Aperture less than 25% of the altitude of the shell, oblique, pyriform, acutely angled posteriorly, slightly produced in front; outer lip fairly thick, though thinning at the margin, moderately produced at the periphery, whence it recedes smoothly into the columella; parietal wall almost flat, forming an obtusely rounded angle with the short, heavy, slightly oblique, weakly arcuate columella, the whole covered by a rather thick layer of callus, sharply bounded in front and, though well reflected in the columellar region, not completely appressed, so that the abruptness of its margin produces in some specimens almost the effect of a narrow delimiting groove. Sculpture wanting, even the growth lines and the few and uncertain varical marks being demonstrable with difficulty.

Measurements of holotype.—Alt. 8.88+, max. diam. 2.81, alt. aperture 2.22, diam., aperture 1.48 mm. The largest paratype measures, alt. 9.25+, max. diam. 2.96, alt. aperture 2.22+, diam. aperture 1.55 mm.

Holotype.—Cat. No. 10908, Berry Collection.

Paratypes.—Cat. No. 10909, Berry Collection; others to be deposited in the collections of Stanford University, the United States National Museum, and the San Diego Natural History Museum.

Type Locality.—*Upper Pleistocene* of Long Wharf Canyon, Santa Monica, California; 9 shells, collected by the late Dr. F. C. Clark.

Remarks.—The shell of this distinct species is sufficiently like no other seen by me to require any detailed comparison. In a general way it somewhat recalls that of *B. micans* (Carpenter), but it is unique in its heavy, smoothly conical shell, with almost truncate base and exceptionally short restricted aperture. I know no Recent shell like it nor have I detected its presence in any Pleistocene horizon other than that exposed at Long Wharf Canyon. The shell surface in most specimens is variously roughened, pocked, or scarred, and this doubtless contributes to the more or less complete defacement of any sculpture initially present.

The specific name proposed is a diminutive of the L, *clava*, club, and has reference to the shape and heaviness of the shell.

Balcis (Balcis) tersa, new species.

Pl. 1, figs. 3, 4

Description.—Shell small, solid, smooth, polished, with an elongate-conic, moderately attenuate, almost perfectly straight-sided spire, though a very slight forward torsion may be detected apically in some specimens. Whorls about 11, the first $2\frac{1}{2}$ or 3 weakly convex with the suture distinctly indented; next whorl less convex, and subsequent whorls quite flat, their suture still clean-cut and distinct, but hardly at all impressed; periphery of last whorl subangulate. Base moderately long, weakly sinuate into the pillar. Aperture pyriform, acutely angulate posteriorly, rounded in front; outer lip nearly straight to the obtuse peripheral subangulation, moderately produced in front; parietal wall weakly convex, forming an obtuse angle with the nearly straight or slightly concave, moderately oblique columellar profile about midway of the aperture, the whole covered with a thin, sharply bounded callus; columellar portion of inner lip reflected over the base and closely appressed to it until anteriorly it gradually comes away to pass imperceptibly into the free portion of the lip. Varical grooves three, with no evident inter-alignment, the last just behind and above the lip.

Measurements of holotype.—Alt. 5.03, max. diam. 1.51, alt. aperture (suture to anterior edge) 1.48, diam. aperture (edge of callus to peripheral angle) 0.81 mm.

Holotype.—Cat. No. 11199, Berry Collection.

Paratypes.—Cat. No. 11204, Berry Collection; others to be deposited in the collections of Stanford University, the United States National Museum, the San Diego Natural History Museum, the Paleontological Research Institution, and the private collection of Emery P. Chace.

Type Locality.—Lower Pleistocene, pocket or lentil in upper sandy phase of Lomita formation at Hilltop Quarry, San Pedro, California; 10 shells, mostly immature; S. S. Berry and E. P. Chace, 1936.

Remarks.—This trim and neat little species in the formal outlines of its shell somewhat suggests four of the described western species. Of these it is clearly distinct from 1) the upper Pleistocene *B. monicensis* (Bartsch) by that being a much larger species, with a wider body whorl

and a relatively lower spire; from 2) the Recent *B. oldroydi* (Bartsch) by that being much less attenuate and having a less distinctly angulate body whorl; and from 3) the Recent *B. linearis* (Carpenter) of the Gulf of California, by that being scarcely half the size. The fourth species, *necropolitana* (Bartsch), is still not well known to Californian students, but the published measurements of the apparently incomplete holotype indicate a shell half again the size of my largest specimen of *tersa*, while the figure gives the impression of an appreciably narrower, more attenuate shell with a correspondingly narrowed aperture. I regret that it has been impossible to accomplish a direct comparison of these two forms prior to publication, but since *B. necropolitana* was described from the Lower San Pedro which implies a definitely cooler fauna, the differences noted seem likely to be indicative of some taxonomic distinctness.

From its several associated congeners in the Hilltop Quarry beds, the present species is readily separable by its straight and very slender form from all but *B. rutila* (Carpenter), a species with which its angulate periphery and less produced base should prevent any confusion by the discriminating student. As in the case of several other species which have been referred to *Balcis* the spire shows evidence of a slight torsion in certain aspects, so the position of the species is borderline.

The specific name chosen is derived from the L., *tersus*, correct, nice, neat,—and refers to the trim form of the shell.

Balcis (*Vitreolina*) *obstipa*, new species.

Pl. 1, figs. 5, 6

Description.—Shell of fair size for the genus and subgenus, solid, smooth, polished, with an apically attenuate, doubly flexed spire, the anterior portion moderately bent to the right, the acutely rounded apex tipped a little dorsad. Whorls about 13 or 14, the first three or four weakly convex with a slightly but distinctly impressed suture; subsequent whorls nearly flat, though a trifle more convex on the side opposite to the flexure, closely applied posteriorly against the distinct but slightly impressed suture; body whorl smoothly rounded with just a hint of peripheral angulation into the weakly convex contour of the somewhat eccentrically produced base. Sculpture absent except for the fine, nearly indistinguishable growth lines and the strong varical grooves; which are completely aligned and form a continuous seamlike fold, first apparent at about the 6th or 7th whorl, thence running

obliquely forward down the concave side of the spire to terminate in the suture just back of the lip, and becoming sweepingly crenate in outline by reason of the slight convexity of each varix and the small angular projection by which it ties into the next succeeding varix at the suture; final whorl without a varix, although there is a slight down-bending of the upper part of the lip just back of the aperture, which adjoins the terminus of the fold and almost imperceptibly brings the latter into alignment with the forward sweep of the lip. Aperture about 27.8% of the altitude of the shell, elongate-pyriform, acutely pointed posteriorly, obtusely rounded in front; parietal wall weakly convex, passing before reaching the median part of the aperture into the thickened, nearly straight, moderately oblique columella, the whole covered with a thin sharply bounded callus, which is notably widest in the columellar region and is there closely reflexed and appressed against the base of the whorl; outer lip rather heavy, well produced peripherally, and thence rounding back into the columellar flare.

Measurements of holotype.—Alt. 9.32, max. diam. (estimated) 3.03, alt. aperture (to suture) 2.59, diam. aperture (outer edge of reflected columellar lip to outer edge of outer lip) 1.48 mm.

Holotype.—Cat. No. 11196, Berry Collection.

Paratypes.—Cat. No. 11205, Berry Collection; others to be deposited in the collections of Stanford University, the United States National Museum, the San Diego Natural History Museum, the Paleontological Research Institution, and the private collection of Emery P. Chace.

Type Locality.—Lower Pleistocene, pocket or lentil in upper sandy phase of Lomita formation at Hilltop Quarry, San Pedro, California; 27 shells, partly immature or fragmentary; E. P. Chace and S. S. Berry, 1935-40.

Remarks.—This charming *Balcis* occurs in association with a somewhat more abundant allied species which I have tentatively identified as probably *B. profalcata* (Bartsch), but its shell is decidedly more robust than that of either the latter species or *catalinensis* (Bartsch), with a larger body whorl and shorter, much more rapidly tapering spire. It is possible that *B. draconis* (Bartsch) of the Dead Man's Island Pleistocene is a near affiliate, but the description and figure indicate it to have a

smaller, heavier shell with a decidedly stouter spire. I regret none the less that I am unable to institute a direct comparison of *B. obstipa*, either with this species or with the Recent *B. grippi* (Bartsch). The spire of the latter would seem to be flexed much too strongly for it to be the same thing despite Bartsch's description (1917:328) of a varical structure essentially similar to that which I have described in a little greater detail here.

The specific name proposed is taken from the *L. obstipus*, bent to one side, and refers to the shape of the spire.

Balcis (Vitreolina) incallida, new species.

Pl. 1, figs. 7-10

Description.—Shell of medium size, heavy, robust, polished, with a stout, fairly acute spire which is moderately to strongly and quite unevenly flexed dorsad, or less commonly ventrad. Whorls about 10 (nearly all mature shells slightly decollate); extreme apex rounded, next two or three whorls convex, with suture well impressed; subsequent whorls weakly convex on the concave side of the spire and a little more so on the convex side; last whorl often attached quite obliquely to the penultimate whorl; suture distinct, moderately impressed; last whorl long, rounded smoothly and obliquely into the base. Sculpture absent except for the fine growth lines and the usually 5, distinct varices, which are more or less scattered, with only an imperfect tendency to aggregate themselves on the concave side of the spire. Aperture about 28% of the length of the shell, pyriform, acutely pointed posteriorly, smoothly rounded in front, hardly produced; parietal wall passing smoothly without angulation into the heavy, weakly concave columella, the whole covered by a thick sharply bounded callus, which recurves rather widely over the columella, its parietal edge nearly straight, thence rounds into the columellar flare at a little more than a right angle; outer lip heavy, though thinning somewhat at the edge, and slightly produced in a low wide curve peripherally.

Measurements of holotype.—Alt. 5.77+, max. diam. 2.22, alt. aperture 1.63, diam. aperture 1.26 mm.

Holotype.—Cat. No. 11197, Berry Collection.

Paratypes.—Cat. No. 11207, Berry Collection; others to be deposited in the collections of Stanford University, the United States

National Museum, the San Diego Natural History Museum, the Paleontological Research Institution, and the private collection of Emery P. Chace.

Type Locality.—*Lower Pleistocene*, Lomita formation of Hilltop Quarry, San Pedro, California; 26 shells taken from pit in quarry floor, S. S. Berry and R. K. Cross, 1934-37; 14 shells from pocket in fine upper marl, S. S. Berry and E. P. Chace, 1935-8.

Remarks.—This species is obviously close to the living *B. thersites* (Carpenter) of the Californian coast¹, and was at first considered as a variant of it, but as material has accumulated, including an extensive series of the immature stages, persistent differences have been noted which it seems desirable to recognize even if later studies should show them to have been over-emphasized. The Hilltop species appears not only to be consistently smaller, but its shell is narrower, the spire is more slender and often with a more irregular torsion, the aperture is smaller and shorter, and the general outline of the last two whorls is markedly less convex, whether comparison be made with living shells or with the beautiful figures of Bartsch (1917:pl. 41, figs. 2-3). Side by side I have found the two quickly and readily separable by these characters down to quite juvenile stages. Furthermore, although Bartsch described the position of the varices of *B. thersites* as "scattered", I note in nearly all my Recent material of this species a quite persistent tendency for them to form on the right (usually concave) side of the spire, a tendency which I do not observe in nearly the same degree in *B. incallida*. The body whorl oft-times is eccentrically attached, appearing not only much awry but somewhat pulled down from the whorl above so as to suggest the slipping of a tight gown. The variability in form of shell is, however, great, as is partially indicated in the figures.

The specific name is the *L. incallidus*, awkward, ungainly.

Balcis (*Vitreolina*) *ebriconus*, new species.

Pl. 1, figs. 13, 14

Description.—Shell small, heavy, stout, polished, with a rapidly tapering, acutely conic, somewhat attenuate apex, which is mildly flexed the left in the two largest, to the right in two of the smaller shells.

¹ I have collected only a single badly decollate shell of what I take to be the genuine *B. thersites* at Hilltop Quarry (figs. 11-12).

Whorls more than eight (all shells somewhat decollate), weakly convex; suture distinct, scarcely impressed; last whorl both high and wide, rather sharply rounded and not carinate at the periphery; basal slope convex. Sculpture absent except for the fine growth lines and about three low, scattered varices rendered distinct by the sharpness of the groove bounding them in front. Aperture a little less than 30% of the length of the shell, pyriform, acutely pointed posteriorly, moderately produced and somewhat narrowly rounded in front; parietal wall slightly convex, curving obtusely into the strong, nearly vertical, weakly concave columella, the whole covered by a fairly thick, closely appressed callus, sharply bounded in front, which recurves widely over the columella and stands away from the base of the shell anteriorly where it passes into the free lip, its edge rounding back into the parietal edge at a wider than right angle; outer lip fairly heavy, thinning considerably at the margin, slightly produced mesially, and well everted basally in front of the columella.

Measurements of holotype.—Alt. 3.7+, max. diam. 1.70, alt. aperture 1.11, diam. aperture 0.96 mm.

Holotype.—Cat. No. 11198, Berry Collection.

Paratypes.—Cat. No. 11208, Berry Collection; others to be deposited in the collections of Stanford University, the United States National Museum, the San Diego Natural History Museum, the Paleontological Research Institution, and the private collection of Emery P. Chace.

Type Locality.—Lower Pleistocene, pocket or lentil in upper sandy phase of Lomita formation at Hilltop Quarry, San Pedro, California; 16 shells, mostly immature, S. S. Berry and E. P. Chace, 1935-40.

Remarks.—The shell of this species is most like those of *B. thersites* and *B. incallida*, but differs in the relatively slight degree of torsion, the much more symmetrical outlines, the more acute spire, and the relatively great width of the body-whorl, which approaches yet does not quite attain a peripheral angulation. The holotype is much the largest of the shells found, nevertheless the position of the last varix seems to indicate that even this example may not represent full maturity. Fortunately even the youngest stages seen are distinguishable by the characters noted.

The specific name is from the *L. ebrius*, tipsy (*meton.*, abundantly filled) + *conus*, cone. In the first meaning given it recalls the shape of the spire, yet in its metonymic sense is no less neatly applicable to the fat body whorl.

Balcis (Vitreolina) loleta, (Jordan, 1926).

Pl. 1, figs. 15, 16

1926. *Melanella loleta* Jordan, California Acad. Sci., Proc., ser. 4, vol. 15, no. 7, pg. 245, 251, pl. 25, fig. 6.

Attracted by their strange beauty, the peculiar natural history of many kinds, and the interesting degree of speciation developed within what would at first sight appear very unpromising limits, I have long been interested in the Eulimidae and have been putting by frequent random notes regarding them. I had written a description of the present form as new, but a careful check with Eric Jordan's account of his *M. loleta* has convinced me that lacking direct comparison of specimens I have no sound ground for regarding this shell from the Pleistocene of Long Wharf Canyon, Santa Monica, as distinct. It has the stockiest shell of any *Balcis* I have studied. It is near to *B. ebriconus* of Hilltop Quarry in its more manifest characters; indeed the two were first thought probably identical, but the robust, nearly straight-sided spire of *B. loleta*, with hardly a trace of torsion, is quite unlike the curved, more attenuately narrowed apex of the Hilltop species. The whorls are at the same time more distinctly convex. The lack of torsion would almost throw *loleta* into *Balcis*, *s.s.*, but its affinities in other respects seem so definitely to lie with *B. ebriconus* and other stubbier members of the *thersites*-group that it seems misplaced away from it.

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