

SOME PECULIAR SPIRAL FOSSIL FORMS FROM CALIFORNIA AND MEXICO

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In 1927 I described some peculiar fossil forms from the Miocene (?) of Maryland.¹ Subsequent to the publication of that paper Dr. Bruce L. Clark, of the University of California, Berkeley, Calif., sent me specimens of similar fossil forms from California and Mexico, and he has kindly permitted me to describe them.

The Maryland specimens are spiral, nearly straight, and irregular objects, probably representing the remains of organisms. They were obtained from the low bluffs along the western shore of Chesapeake Bay, St. Marys County, Md. For the spiral form I proposed a new generic name, *Xenohelix*, and designated *Xenohelix marylandica* Mansfield as the genotype. I said that I had not formulated any particular theory to explain the origin of the coiled or uncoiled forms. I also mentioned that if these forms owe their origin to some organism, as they probably do, that of some marine plant, perhaps a fucoid, seems the more likely. I have obtained no additional information to explain the origin either of the Maryland specimens or the specimens described in this paper. Neither do I know that the specimens obtained in so widely separated areas have the same origin.

DESCRIPTION OF TWO NEW SPECIES

I have placed the following two new species provisionally under the genus *Xenohelix*, although they may have no generic relationship to the Maryland form.

XENOHELIX? CLARKI, new species

Plate 1, Figure 1

The specimen selected as the holotype is incomplete, the whorls at either extremity having been broken away. It consists of four

¹ U. S. Nat. Mus. Proc., vol. 71, No. 2688, art. 16, 1927.

symmetrically and regularly coiled, equally spaced, and equally sized whorls. The outline of the tube in cross section is elliptical. No demarcation is observed in cross section to indicate a peripheral wall distinct from a central core. The material composing the tube appears to be the same as that of the surrounding matrix. A petrographic analysis² of the material of the tube shows that it consists of fine-grained sand cemented with calcium carbonate and that the dominant minerals present are calcite, quartz, feldspar, and biotite.

Xenohelix? clarki apparently differs from *Xenohelix marylandica* Mansfield in lacking, in cross section, two distinct parts—the peripheral wall and the central core. The species is named in honor of Dr. Bruce L. Clark.

Dimensions.—Holotype (Cat. No. 371106, U.S.N.M.); Length, 74 millimeters; diameter, 42 millimeters; maximum diameter of tube, 18 millimeters.

The coils of another specimen (pl. 2, figs. 1, 2) obtained at the same locality are more drawn out than those of the holotype.

Occurrence.—Pine Canyon, Contra Costa County, Calif. Doctor Clark informs me that both specimens were collected near the top of the Monterey group at a horizon which he considers equivalent to the "Temblor," in the middle part of the State, and are associated with a marine middle Miocene fauna which includes such species as *Bruclarkia stanfordensis* (Arnold), *Arca devincta* Conrad, *Macoma*, new species, *Pecten* cf. *perrini* Arnold, and several other species.

XENOHELIX? MEXICANA, new species

Plate 1, Figures 2, 3

The specimen selected as the holotype is incomplete, the whorls at either extremity having been broken away. The specimen consists of three symmetrically and regularly coiled, equally spaced, and equally sized whorls. The outline of the tube in cross section is elliptical, being broadly angled at the periphery. Obscure spiral raised lines occur near the periphery of the whorls. The material composing the tube consists of ferruginous fine-grained sand and small mica flakes and the surrounding matrix consists of dark-colored shale containing particles of carbonaceous matter.

Dimensions.—Holotype (Cat. No. 371107, U.S.N.M.): Length, 36 millimeters; diameter, 25 millimeters; maximum diameter of tube, 11 millimeters.

Occurrence.—The label accompanying the specimens gives the following information: "Black shales probably from the base of the *Exogyra costata* horizon [Cretaceous]. Lower beds on top of Sierra de la Azufrosa on boundary line of Haciendas Mesillas and Azufrosa,

² Analysis made by C. S. Ross, of the section of petrology, U. S. Geological Survey.

southeast of Monument 19, municipality of Ramos Arizpe, State of Coahuila, Mexico. Collected by P. D. Krynine." Other smaller specimens from the same locality are like the holotype except that their diameters are proportionately somewhat greater.

DESCRIPTION OF PLATES

PLATE 1

FIG. 1. *Xenohelix? clarki* Mansfield, holotype ($\times 1$), p. 1.

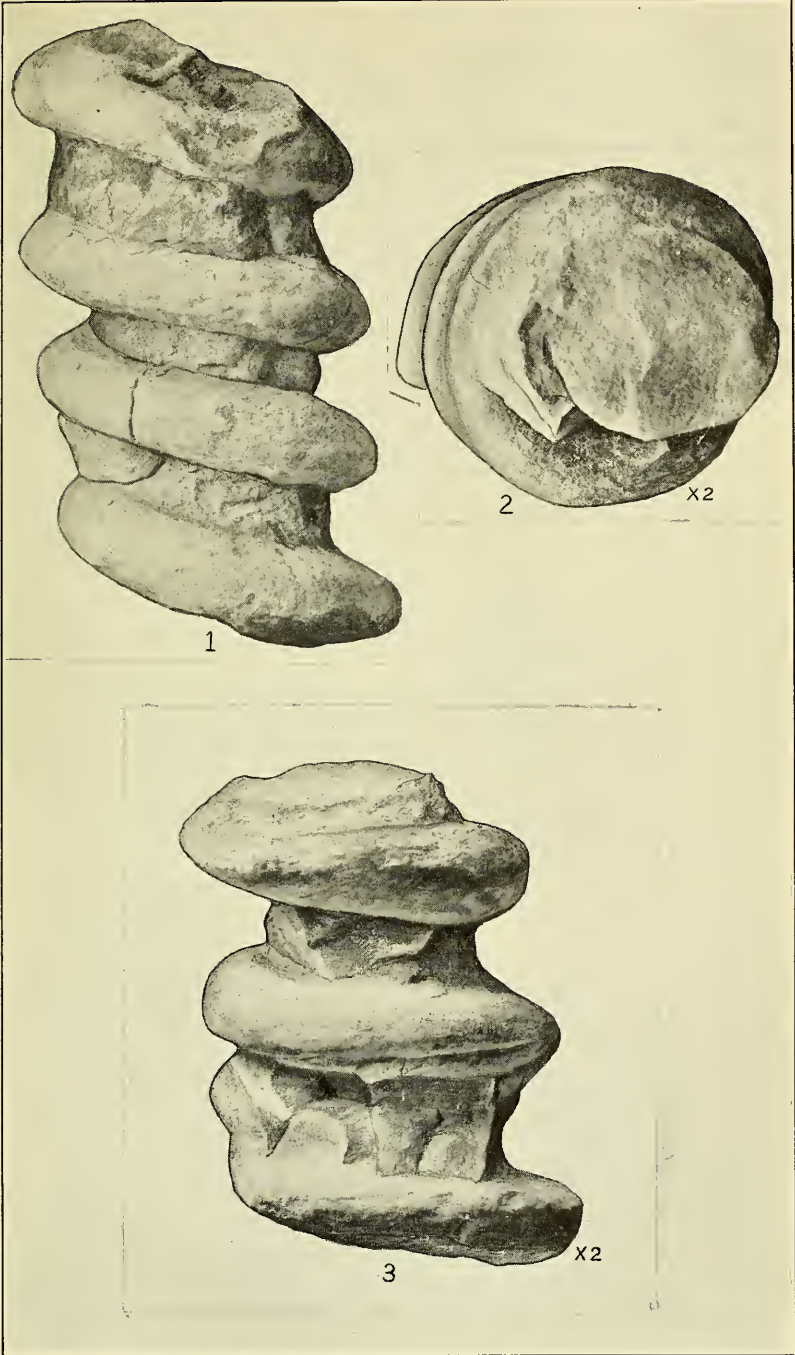
FIGS. 2, 3. (*Xenohelix? mexicana* Mansfield, holotype ($\times 2$), p. 2.

Fig. 2, end view. Fig. 3, side view.

PLATE 2

FIGS. 1, 2. *Xenohelix? clarki* Mansfield, paratype ($\times 1$), p. 1.

Fig. 1, side view. Fig. 2, end view of same specimen.



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FOR EXPLANATION OF PLATE SEE PAGE 3.



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