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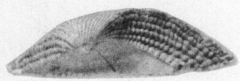
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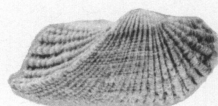
**ARCA (ARCA) LEPTOGRAMMICA, A NEW LATE  
TERTIARY PELECYPOD FROM THE SAN LUIS  
OBISPO REGION, CALIFORNIA**

BY  
**CLARENCE A. HALL, Jr.**

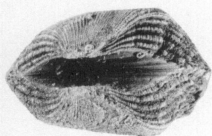
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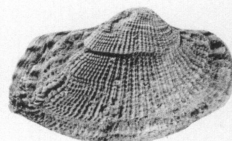
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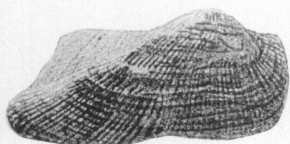
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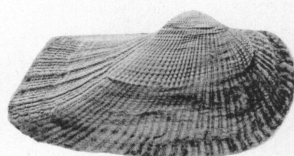
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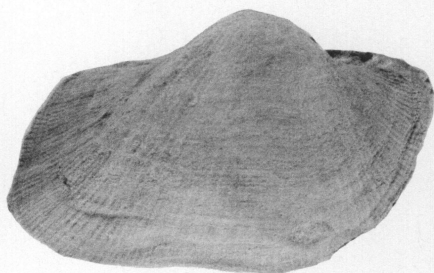
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*ARCA (ARCA) LEPTOGRAMMICA*, A NEW LATE TERTIARY  
PELECYPOD FROM THE SAN LUIS OBISPO  
REGION, CALIFORNIA

CLARENCE A. HALL, JR.

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ABSTRACT—A new pelecypod, *Arca (Arca) leptogrammica*, is described from the late Miocene of California.

INTRODUCTION

**D**URING the last few years extensive collections of Late Miocene and Early Pliocene Mollusca and Echinoidea have been made in western San Luis Obispo County, California. Most of the collections consist of pectens, the echinoid *Astrodapsis*, *Turritella*, etc. A new pelecypod was found with or near these other fossil animals. This new pelecypod—an *Arca*—occurs with fossil species and genera that are today living in the Panamic zoogeographic province. *Arca* is restricted, along the present-day west coast of North America, to tropical waters and there is a strong suggestion that the new species of *Arca* described below, and its accompanying assemblage, were living in a tropical or near-tropical environment. The new species does not seem to be closely related to any living or fossil arcas. Its large size, more than twice or three times the size of fossil arcas from California, and as large as tropical arcas, its somewhat centrally located beaks, and fine-ribbing set it apart from all known arcas. Its ancestry, and evolutionary history are at present unknown.

SYSTEMATIC DESCRIPTION

Family ARCIDAE

Subfamily ARCINAE

Genus ARCA, Linné, 1758

*Arca* Linné, 1758, p. 693.

*Type*.—*Arca noae* Linné, 1758 (by action of the International Commission on Zoological Nomenclature, Oct. 5, 1944, Opinion 189).

Subgenus ARCA, s.s.

ARCA (ARCA) LEPTOGRAMMICA Hall, n. sp.  
Pl. 22, figs. 9, 10.

*Holotype*.—Univ. of Calif. at Los Angeles  
Cat. No. 34997.

*Paratype*.—Univ. of Calif. at Los Angeles  
Cat. No. 34998.

*Occurrence*.—UCLA fossil loc. 4180; 350 feet north, 1200 feet west from the northwest corner of sec. 1, T. 32 S., R. 14 E., 1952 ed. Nipomo Quadrangle, San Luis Obispo County, California. In fine-grained tuffaceous sandstone and siltstone—the Phoenix, submember 5, Santa Margarita formation (Hall, 1962, p. 61).

*Description*.—Moderately large, rhombic in outline, anterior extremity broadly rounded,

EXPLANATION OF PLATE 22

- FIGS. 1-2—*Arca (Arca) sisquocencis* Reinhart. UCLA hypotype no. 3524. Santa Barbara Formation, Packards Hill, Santa Barbara, California. Plio-Pleistocene. Length 8.3 mm.  $\times 3.28$ .  
3—*Arca (Arca) mutabilis* (Sowerby). UCLA hypotype no. 10. San Carlos Bay, near Guaymas, Mexico. Recent. Length, 25 mm.  $\times 1$ .  
4—*Arca (Arca) mutabilis* (Sowerby). UCLA hypotype no. 9. Same locality as fig. 3. Length 28 mm.  $\times 1$ .  
5, 8—*Arca (Arca) washingtoniana* Dickerson. Reproduction of photograph, Reinhart, P. W., 1943, Geol. Soc. Amer. Spec. Paper no. 47, pl. 4, figs. 2, 4. Oligocene of Washington. Length 14.5 mm.  $\times 2.6$ .  
6, 7—*Arca (Arca) boucardi* Jousseau. Stanford hypotype no. 26651. Mutu Bay, Aomori prefecture, Japan. Recent. Length, 36.9 mm.  $\times 1$ .  
9, 10—*Arca (Arca) leptogrammica* n. sp. UCLA holotype no. 34997. Santa Margarita Formation, San Luis Obispo Co., California. Late Miocene, lower Delmontian. Length 56 mm.  $\times 1.1$ , fig. 9;  $\times 1$ , fig. 10.

ventral margin nearly straight, small byssal gape slightly posterior of center, and posterior margin sharply rounded below, gently rounded above. Numerous thin radial ribs crossed by extremely faint concentric growth lines. Ribs closely spaced, interribs approximately 4/10 mm. wide, ribs slightly bunched posteriorly. Hinge narrow.

*Dimensions.*—Holotype, length, 56 mm., height 34 mm.; paratype, length 20 mm., height 13 mm.

*Age.*—Late Miocene, lower Delmontian.

*Remarks.*—*Arca leptogrammica* is in association with the following mollusks: *Anadara trilineata calcarea* (Grant & Gale), *Anadara trilineata* (Conrad), *Lucinoma actuilineata* (Conrad), *Modiolus rectus* Conrad, *Nuculana furioni* Trask, *Panope generosa* (Gould), *Pecten* (*Chlamys*) *hodgei* Hertlein, *Saxidomus* sp., and *Trachycardium quadragenarium* (Conrad). In the same submember are the following mollusks: *Dosinia* aff. *D. arnoldi* Clark, and *Turritella* cf. *T. margaritana* Nomland. *Balanus* sp. and the brachiopod *Discinisca* cf. *D. cumingii* Broderip. The brachiopod species lives today in the Panamic province and in the northward extension of the Panamic province in the Gulf of California.

Above the *Arca-Turritella* assemblage of the Phoenix submember 5 is a fine-grained white sandstone, and above this white sandstone is a coarse-grained arkosic sandstone containing abundant *Astrodapsis spatiosus* and *A. whitneyi*.

*Arca washingtoniana* Dickerson, from the Oligocene of Washington and Oregon, is more elongate and the area dorsal of the prominent

posterior ridge extending from the umbo to the ventral margin is more pronounced. *A. leptogrammica* is nearly two to four times larger than *A. washingtoniana*. The Pliocene *Arca santamariensis* Reinhart, although possessing fine radial ribs above the ridge from umbo to ventral margin, is smaller, has a depression at each end of the posterior slope, centrally located umbones, and a rounded posterior slope in comparison with *Arca leptogrammica*.

*Arca sisquocensis* Reinhart is much smaller than *A. leptogrammica* and it has beaded and moderately coarse ribs for its size. Although the beaks of *A. mutabilis* are more centrally located, as they are in *A. leptogrammica*, the posterior ribs are distinctly coarser than those in the central portion of the shell. The only species, fossil or living, that seems to resemble *A. leptogrammica* is the Pliocene to Recent Japanese species *A. boucardi* Jousseau. However, the umbones of *A. boucardi* are more anterior and the shells are smaller. The bundles of ribs on the posterior slope of *A. boucardi* are more pronounced than those of *A. leptogrammica*.

Most of the above mentioned species of *Arca* are figured for comparative purposes in the accompanying plate.

#### LITERATURE CITED

- HALL, C. A., JR., 1962, Evolution of the echinoid genus *Astrodapsis*; Univ. of Calif. Pub. Geol. Sci., v. 40, no. 2, p. 47-180.  
 LINNÉ, CARL VON, 1758, Systema naturae per regna tria naturae . . . editio decima, reformata. Stockholm, v. 1, Regnum animale, p. 693.

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