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Ornaments of Two Extinct Marine Pelecypods from the Barrel Springs Site in the Colorado Desert

JANICE F. FISHER
JOHN W. FOSTER
JOAN OXENDINE

The aboriginal use and modification of marine shell is well known throughout California and the greater Southwest. Ethnographic accounts and archaeological evidence indicate that native peoples found many uses for shell. The results of shell analyses from archaeological contexts have been used to interpret trade contacts (Tower 1945; Bennyhoff and Heizer 1958; Davis 1961), seasonality (Weide 1969; Drover 1974), paleoenvironmental conditions (Miller 1966; Warren 1968), tool use (Massey 1955; Rosenthal *et al.* 1978), and ornamentation (Gifford 1949; Haury 1938, 1950; Alvarez de Williams 1975).

This report documents the recovery of modified remains of two extinct marine pelecypod mollusks, *Rangia lecontei* and *Ostrea vespertina,* from an archaeological deposit at Barrel Springs (CA-SDi-4443) in eastern San Diego County. *O. vespertina* has not been reported previously in an archaeological context. Smith (in Alvarez de Williams 1975) briefly noted the occurrence of *R. lecontei* in an archaeological context in the Lake Cahuilla (Salton) Basin.[1]

Surface collections and excavations at Barrel Springs were undertaken by the California Department of Parks and Recreation during May and June of 1977. The site lies within the Ocotillo Wells State Vehicle Recreation Area, and the excavation project was initiated due to the damaging effects of off-highway vehicles and wind erosion.

The Barrel Springs site occupies a portion of a large mesquite dune. The dune is situated approximately 4 km. east of the confluence of San Felipe Creek and Palo Verde Wash, less than 6 km. from the shoreline of ancient Lake Cahuilla in the Lower Borrego Valley (Fig. 1).

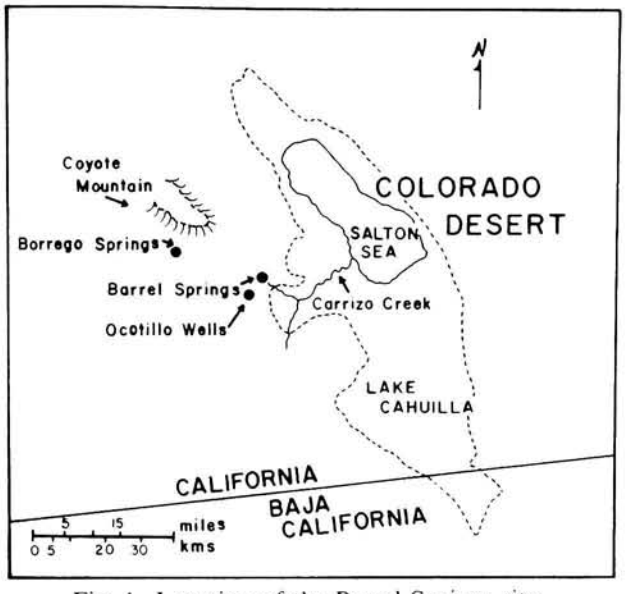

Fig. 1. Location of the Barrel Springs site.

The body of the formerly stable but now partially deflated formation overlies a spring seepage and is comprised of numerous sand hillocks topped by remnant mesquite growth. The archaeological deposit is composed primarily of lithics, ceramics, and food debris. The Barrel Springs locale apparently served as a temporary camp for mesquite pod harvesting, hunting, and tool and ornament manufacture by small groups of aboriginal peoples from before A.D. 1500 until 1816 or later (Oxendine n.d.). The site contained a small quantity of modified and unmodified shell remains including specimens of the extinct marine species, *Rangia lecontei* and *Ostrea vespertina.*

DESCRIPTION

Rangia lecontei (Conrad) is an extinct species of pelecypod and a member of the family Mactridae. The species was described by T. A. Conrad as *Gnathodon lecontei,* for Dr. John L. LeConte, who first collected it (Conrad 1853:273; Keen 1971: 201, 207). This clam is ovato-triangular in outline (Fig. 2). The anterior side of the shell is short and rounded, while the posterior is wedge-shaped. The umbonal slope is oblique; the right valve displays two cardinal teeth separated by a profound pit. The left valve possesses one cardinal bifid tooth and lateral teeth that are prominent and acute (Conrad 1853:273).

R. lecontei has a wide range throughout southern California. The type specimen was collected from limestone fossil beds north of Carrizo Creek near Barrel Springs. Although once thought to be of Miocene age, it is now

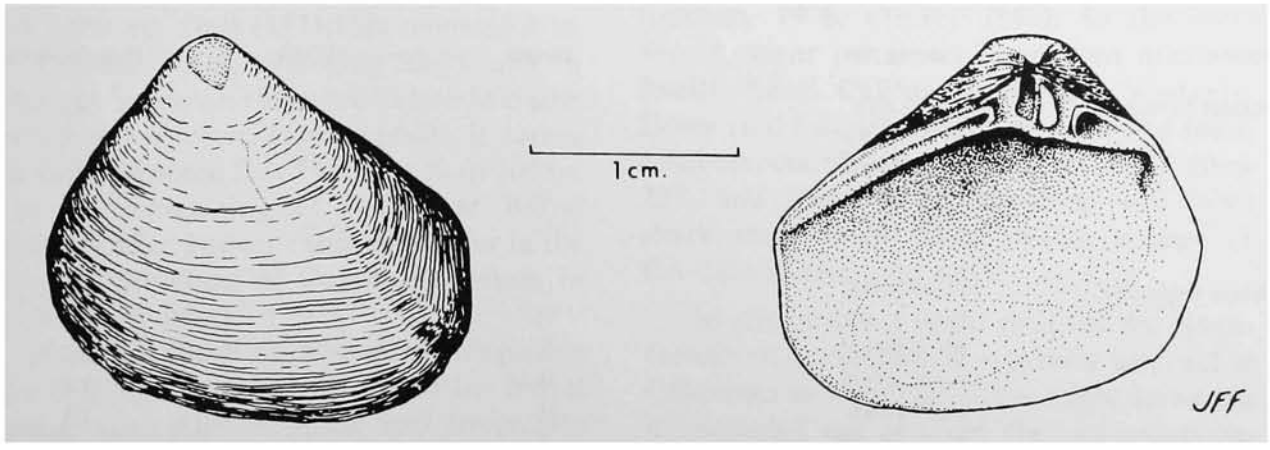

Fig. 2. Two views of a valve of *Rangia lecontei* showing beginning modification of the umbo by abrasion. Cat. No. P-177-12-SB.

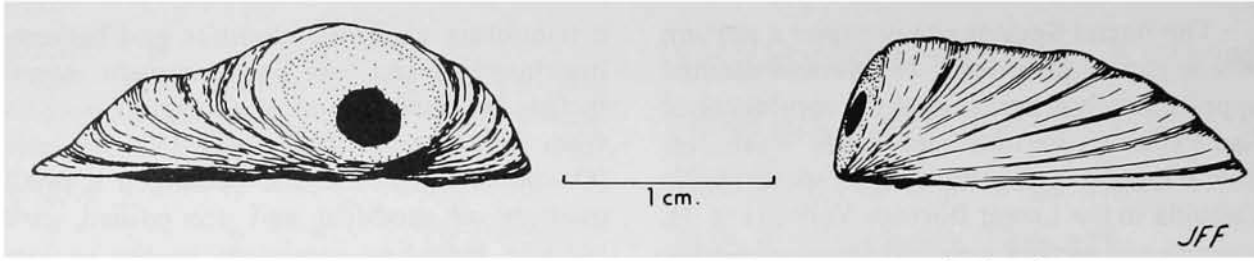

Fig. 3. Views of *Rangia lecontei* valve showing perforation formed in the umbo by grinding. Cat. No. P-177-3-SB.

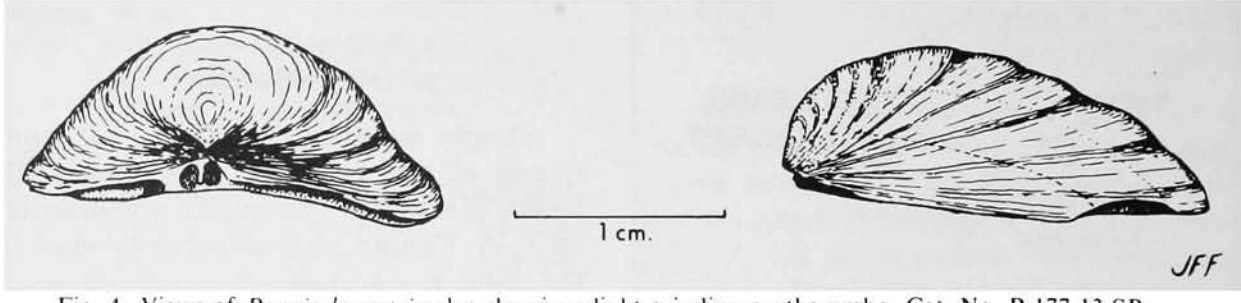

Fig. 4. Views of *Rangia lecontei* valve showing slight grinding on the umbo. Cat. No. P-177-13-SB.

known to date from late Quaternary deposits assigned to the upper Pleistocene and early Holocene.[2]

Nine modified *R. lecontei* shells were collected at Barrel Springs. Eight specimens were distributed within the upper 10-20 cm. of surface blow sand on the dune, while the remaining shell was recovered at a depth of 70-90 cm. Five shells display holes: the apex of each umbo has been ground down until a perforation was formed (Fig. 3). The hole diameters created in this fashion are by no means uniform (Table 1). The remaining four specimens exhibit various stages of hole manufacture (Figs. 2-4). Microscopic examination revealed striations on the ground surface of the umbonal area, indicating that human activity rather than natural weathering

Table 1

DIMENSIONS OF FOSSIL SHELL ORNAMENTS FROM THE BARREL SPRINGS SITE (in mm)

Species	Catalog No.	Length	Width	Hole Diameter
Rangia lecontei	P-177-3-SB	24	19	4.0
	P-177-11-SB	13	—	3.0
	P-177-25-SB	13	11	2.1
	P-177-30-SB	10	10	1.5
	P-177-41-SB	12	—	1.2
Ostrea vespertina	P-177-31-SB	13	8	1.1
	P-177-32-SB	11	6	1.6
	P-177-36-SB	20	16	3.0, 2.0
	P-177-46-SB	16	12	1.4
	P-177-47-SB	12	9	1.5
	P-177-47a-SB	9	7	1.0
	P-177-49-SB	13	11	1.0
	P-177-50-SB	14	11	1.0

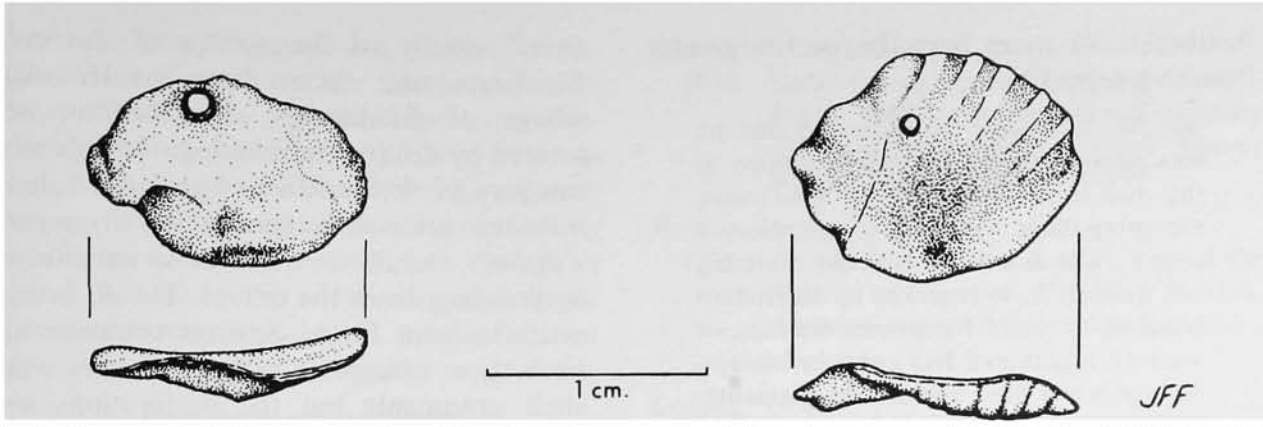

Fig. 5. Ornaments of *Ostrea vespertina* with perforations made by drilling from one surface. Cat Nos. P-177-47-SB, P-177-50-SB.

is responsible for the perforations.[3]

There is additional evidence for the local manufacture of *R. lecontei* ornaments. An experiment was conducted in which an unmodified shell was ground on sandstone. Sandstone was chosen because of its abundance at the site and since it was probably used as an abrasive. After 15 minutes of grinding, a perforation equivalent to that in the recovered modified shells was produced in the umbo of the test specimen. Striations microscopically evident on the ground surface were identical to those noted on the specimens from Barrel Springs.

Ostrea vespertina Conrad is an extinct oyster having a fluted, moderately thick shell with 6-15 irregular, rather angular plications (folds). These increase in number from the beak outward. Gale (1931:152) reported it to be of medium size, averaging 50-75 mm. in length. *O. vespertina* is found in late Miocene through late Pliocene fossil deposits. It occurs in a small exposed fossil reef less than 100 m. from the archaeological deposit at Barrel Springs. Other known exposures occur in the Imperial formation of Coyote Mountain in late Pliocene strata.

Eight modified *O. vespertina* fragments were collected from the surface of the Barrel Springs site. All are small and irregularly shaped, having been manufactured from varying portions of the shells. The holes, located in the center or toward one edge of each fragment, show evidence of drilling from one side only (Fig. 5). String wear is observable on six of the specimens, and one specimen exhibits two holes. The specimens show little variation in fragment or perforation size. Length, width, and hole diameter (in mm.) of the recovered specimens are shown in Table 1.

DISCUSSION

The occurrence of fossils in archaeological sites is a widespread phenomenon. Amber, ammonites, jet, toadstones, and fossil shark teeth, as well as other invertebrate and vertebrate animal fossils, have been discovered throughout the Old World in archaeological sites dating back to Paleolithic times (cf. Kennedy 1976; Oakley 1965). In the New World, scant references have been made to fossils from California cultural contexts. Dotta (n.d.) noted ammonite casts and fossil coral associated with four burials at CA-Sha-237, and West (n.d.) identified ten fossil shark teeth from three extinct species at CA-SBa-87 (Refugio Bay).

Modification of fossil shell for the manufacture of ornaments is relatively unusual in California archaeology. One might think the documented use of fossil shell as ornaments in California would be more prevalent considering the statements presented for southern

Arizona, and more broadly for the greater Southwest, by Haury:

> Mr. M. J. Rogers has indicated that he sees good evidence for believing most of the shell used throughout the Southwest, excepting those types exhibiting iridescent nacres, was not fresh but old material, *i.e.*, dead shells were picked up on modern beaches, or raised Pleistocene beaches, or were even gathered from old shell heaps. Almost never does one see any pigmentation in such species as *Glycimeris* [sic] from the Hohokam ruins, and the unworked shells often manifest considerable abrasion as though rolled by water. Additional evidence for this claim is found in a bracelet fragment from Ventana . . . which, on the inside of the umbo, retains an extremely hard siliceous matrix, worn smooth as the bracelet was made and later partly chipped away as the umbo was perforated. This cemented accretion could hardly have come about in any other way except by long burial of the shell [1950:369].

The manufacture of shell ornaments by simply grinding down the umbos of pelecypods to produce perforations (as in the case with the *R. lecontei* ornaments from Barrel Springs; Fig. 3) is a distinctive trait which bears consideration. Such modification is not common to recognized shell working industries of the southern California Pacific Coast (King n.d.), however this type of modification is documented for northwestern California (cf. Gifford 1947:9) and particularly in the interior of the American Southwest. Johnson (1960: 179-180 in Bowen 1976:87) refers to *Glycymeris* shell bracelets manufactured ". . . by the *normal* Hohokam process of thinning the convex side of the shell by grinding it down" (emphasis ours) as exemplified in Snaketown's Santa Cruz and Sacaton Phases of the Colonial and Sedentary Periods, respectively. More specifically, Haury (1938:135, 141, 146) described what are termed "whole shell pendants" chiefly of the species of *Turritella, Cerithium,* and *Pecten* from the Hohokam village of Snaketown. Perforations were formed by drilling or breaking. Haury's other category of shell artifacts, "perforated shell," included principally species of *Glycymeris, Cardium,* and *Pecten* whose holes were formed by grinding down the umbos. The *R. lecontei* artifacts from Barrel Springs compare with both these categories in that they are whole shell ornaments but the perforations were formed by grinding rather than breaking or drilling. Aside from the one report of an *R. lecontei* ornament from Lake Cahuilla whose perforation had been manufactured by drilling a small hole near the hinge (Alvarez de Williams 1975:10), the only other report of a similar ornament from a southern California archaeological context is found in the results of the excavations at Perris Reservoir. One shell ornament of *Glycymeris* cf. *subobsoleta,* recovered at the Peppertree site (CA-Riv-463), exhibits a hole formed by grinding down the umbo (Mix 1974:141).

A possible explanation for the previously unreported status of *O. vespertina* and the single report of *R. lecontei* ornaments is that the utility of these items apparently was restricted exclusively to their manufacturers. They seem to have attained only a limited level of exchange. The criteria proposed by King (1974:81-84) for the values and uses of shell ornaments exchanged between persons or households seem applicable to both *O. vespertina* and *R. lecontei* ornaments recovered from Barrel Springs: they were made of material that was relatively easy to obtain and manufacture, and consequently they required a relatively small expenditure of energy in their production. The greatest likelihood is that these ornaments were used to supplement imported ornaments of greater intrinsic value.

Present data suggest the *O. vespertina* and *R. lecontei* ornaments from Barrel Springs

bear little morphological similarity to aboriginal ornaments from the southern Pacific Coast of California, but rather are more comparable to ornaments recovered from archaeological deposits within the greater Southwest. Future research is needed on shell ornaments from other sites in the Colorado Desert to further document the occurrence and distribution of culturally modified *Rangia lecontei* and *Ostrea vespertina* remains.

ACKNOWLEDGMENTS

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Riverside, California

California Deprtment of Parks and Recreation, Sacramento, California

Murrieta, California

NOTES

1. The *Rangia lecontei* reported by Desmond Smith (Alvarez de Williams 1975:10) was referred to as a freshwater clam. In actuality, *R. lecontei* was a marine or brackish water clam.

2. The identification of *Rangia lecontei* and *Ostrea vespertina* was made by Jack Mount of the University of California, Riverside. We are grateful for his observations and comments on the age and distribution of these fossil forms.

3. Philip J. Wilke of the University of California, Riverside examined the ornaments and made suggestions which have been incorporated into this paper. We gratefully acknowledge his contribution to this work.

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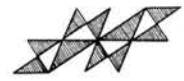

Dicoria canescens T. & G., an Aboriginal Food Plant in the Arid West

PHILIP J. WILKE
MARY DEDECKER
LAWRENCE E. DAWSON

Although its use is not documented in published ethnobotanical accounts of the Indians of the western deserts, archaeological evidence suggests that two subspecies of