A Note on Flaked Shell Implements: An Experimental Study

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Introduction

Solheim (1976: 37–39) has suggested the existence of a Shell Tradition in the southeast portion of the Philippine archipelago, consisting of flaked and ground shell implements. One of the sites belonging to this tradition is the Talikod Rockshelter, which was test-excavated by Solheim in 1972 and later more intensively investigated by Legaspi, with no report yet forthcoming (Solheim, personal communication). One shell sample from the test excavations was run twice for two radiocarbon dates of 3950 ± 90 B.P. and 4170 ± 90 B.P. (SUA-258) (Solheim 1976: 37).

In the fall of 1976, the author examined a small sample of the midden material from the Talikod Rockshelter. The intent was to separate out flaked shell implements, analyze them in terms of morphological attributes, and then to attempt to replicate these implements by experimental means. This paper presents the findings of this work.

Flaked Shell Artifacts

Ten pieces of shell exhibiting unifacial flaking were designated as artifacts. The flaking occurred along one lateral edge or along one end of the piece of shell. The artifact forms are varied and in general crude and uninspired (Fig. 1). Because of the variability and smallness of the sample, no formal types were established. Nine of the artifacts were made of *Tridacna* spp. shell and one was made of *Conus* spp. shell.

The artifacts range in length (measured perpendicularly through the working edge) from 11 to 91 mm, with a mean length of 36.5 mm. The working edge length ranges from 18 to 38 mm, with a mean of 28.7 mm. Half the artifacts exhibit flake

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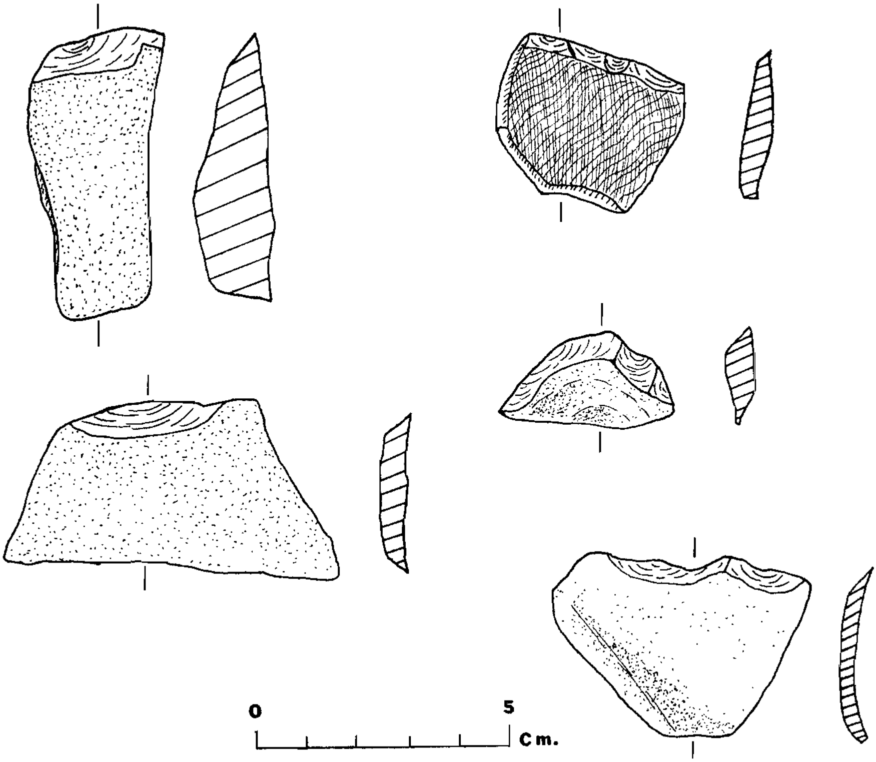

Fig. 1 Flaked shell artifacts.

scars on the dorsal surface (shell exterior) and the remaining specimens have flake scars on the ventral surface. The number of flakes removed ranges from 1 to 4, with a mean of 1.3 flakes and a mode of 2 to 3 flakes. The length of the flake scars (measured perpendicularly through the center of the striking platform) ranges from 2.8 to 9.2 mm, with a mean of 5.6 mm. The width of the flake scars, at the platform, ranges from 3.5 to 29.9 mm, with a mean of 12.7 mm. The working edge angles were measured with a forma-gage and range from 35° to 70°, with a mean of 49°.

The flake scars appear fairly "rough," almost "chunky," and exhibit a quite diffuse negative bulb of force (Crabtree 1972: 59, 78). It was felt that this characteristic of the flake scars was due to the nonglassy nature of the raw material, which might cause the waves of force to proceed from their initiating point in a halting or jerking manner.

Experimentation

The goal of the experimentation was to replicate the flaking patterns observed on the shell artifacts on pieces of *Tridacna* spp. shell. If these artifacts could be replicated, credibility would be added to the notion that the artifacts were "real" and something would be learned about the behavior of the people making and using these shell implements.

Three pieces of *Tridacna* spp. shell were utilized for the experiment, two from the site's midden sample and one fresh piece. The pieces from the midden sample appeared to have been partially fossilized; the fresh piece showed no signs of fossilization. It was felt that a comparison could be made between the flaking qualities of the partially fossilized shell and the nonfossilized shell. Parenthetically, it should be noted that the shell from the site's midden was fairly small (c. 60 × 40 mm and 40 × 30 mm), whereas the fresh piece was fairly large (c. 180 × 100 mm) and was first reduced into 13 or 14 workable blanks by the bipolar technique (Crabtree 1972: 42), which in this case was simply effected by resting the whole shell on a flat stone and shattering it into pieces by striking it with a large hammerstone.

Three basalt hammerstones of varying hardness (Moh's hardness scale of 6.5, 5.5, and 3.5) were utilized. Direct freehand percussion (Crabtree 1972: 59) was used exclusively throughout the experimentation. Flaking was attempted on both the dorsal and ventral surfaces of the shell pieces.

A number of results were obtained from the replicative experimentation:

1. A usable cutting or scraping edge was obtained on one piece of fresh shell, by chance, during initial breakage (Fig. 2*b*).
2. It appeared to be easier to induce fracture on the fresh shell than on the partially fossilized shell.
3. Better flaking results were obtained with the softer hammerstone.
4. Flaking was quite unpredictable. There appear to be nonpatterned planes of weakness within the shell which do not allow for the predictable removal of flakes. These planes of weakness probably result from the repeated blows that the shell was subjected to in the process of trying to remove a flake. Because of these planes of weakness, elongated "chunky" flakes would be removed along the working edge. Oftentimes these flakes would produce a sharp cutting or scraping edge.

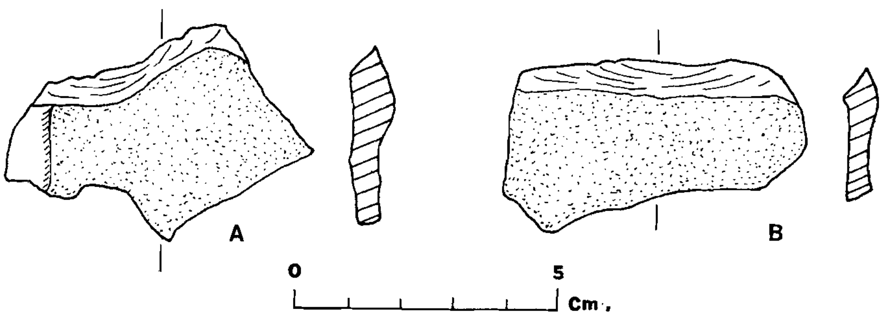

Fig. 2 Replicated shell artifacts

CONCLUSIONS AND RECOMMENDATIONS

Although experimental replication was limited, certain tentative conclusions can be drawn from this work and recommendations can be made for further work in this area of analysis.

The inhabitants of the Talikod Rockshelter were undoubtedly making and using flaked shell implements. These shell implements would probably function well for cutting and scraping tasks, such as preparing vegetable foods and fish, or stripping rattan vines.

Since it appears easier to remove flakes from fresh shell than from partially fossilized shell, the inhabitants of the rockshelter were probably using fresh shell as their raw material for flaked shell implements. The initial breakage of the whole shell, reducing it into workable blanks, could have readily occurred in the process of breaking the shell for meat extraction. During this process, a certain number of shell pieces could be produced, by chance, that exhibit a sharp cutting edge. These pieces could then be utilized without further modification. Other pieces of shell could be modified into cutting and/or scraping implements by the unifacial removal of flakes along one edge through direct freehand percussion. Although flake removal is quite unpredictable, rudimentary tools could be fashioned in this manner.

Further work should be undertaken to quantify what has been done here. Shell material from archaeological contexts should be closely examined for evidence of flaking. In this way, our archaeological sample will be enlarged and different variations of shell flaking will become apparent. More experimental work should be undertaken; fresh, rolled, partially fossilized, and fully fossilized shell should be flaked in sufficient quantities to determine the flaking qualities of these types of shell. Hammerstones of varying hardness and density should be utilized. In addition, the author suggests experimenting with the use of baton percussors of branch coral and wood, which may be more efficient in inducing fracture.

Another interesting avenue of investigation would involve heat treatment of the shell material prior to flaking. Crabtree and Butler (1964) and Purdy (1975) have done experimental work with heat treating siliceous stone material. It was found that heat treatment changed the internal consistency of the stone and made it easier to remove flakes. It was also noted (Crabtree and Butler 1964: 2) that the luster of the stone material changed from dull to greasy after heat treatment. A greasy luster was not observed on the archaeological specimens, but it is not clear whether there would be such a luster change in shell material. The heat treatment may, however, increase the predictability of flake removal.

Use-wear studies should also be undertaken (1) to determine the efficiency of flaked shell implements in cutting and scraping tasks on different materials, and (2) to discover wear patterns and attrition rates of these tools.

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