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Reviewed Article:

How were Half-Moons on Shells Made in the Upper Palaeolithic? An Experimental Approach

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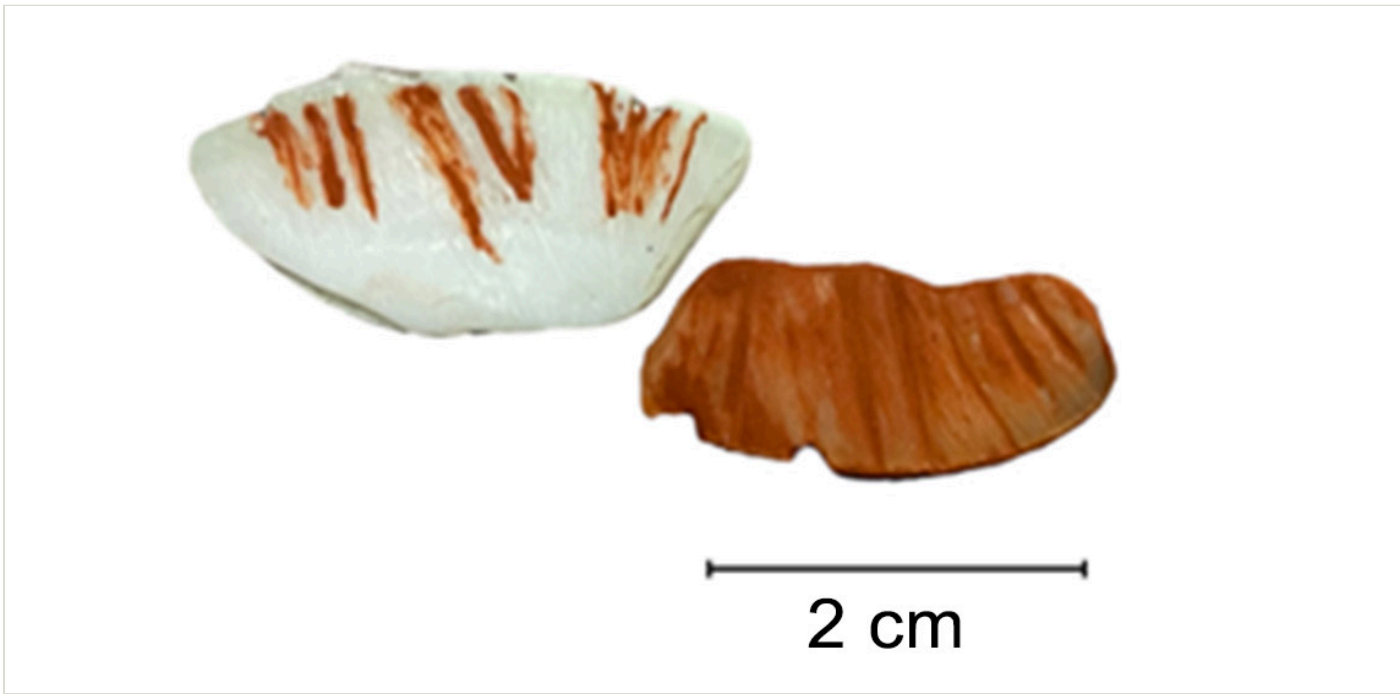

In the Upper Palaeolithic levels of the site of Grotta Continenza (Abruzzo, Italy), numerous shells shaped as half-moons have been found. These artifacts, being important examples of ancient ornaments, have been regularly subjects of study, but the production process has only been hypothesised. This research, with the support of an experimental protocol, presents a possible manufacturing sequence for their creation.

Introduction

> Half-moon production in the Upper Palaeolithic must have been a speedy activity, with minimal special skills required, apart from a lot of patience and some manual dexterity: anyone within the group could attend to it, perhaps the children as well.

The aim of the study is to reconstruct the *chaîne opératoire* required to create half-moon-shaped objects from mollusc shell valva, common objects in Italian burials from the Upper Paleolithic onward. They have been classified as ornaments, but their real function is still debated today. Through experimental reproduction it is possible to reflect on the time and skills required in working, on the relative ease with which raw materials are obtained, and on the importance that the finished object may have had within the community. The reproduction of an object, when following experimental protocols, can be a valuable tool for archaeologists to reconstruct the activities carried out in the past and to reach a further understanding of the related dynamics.

The starting point of this research is the archaeological site of Grotta Continenza (Abruzzo, Italy) where excavations in the late 1900s revealed levels of frequentation spanning from the Upper Paleolithic to the Neolithic period (from about 15,500 cal BP to about 5000 cal BP, see Boschian *et al.,* 2017). Several burials have been documented in this rock formation: some from the Early Neolithic and others referable to the Upper Paleolithic. (Grifoni Cremonesi, 2003; Astuti *et al.*, 2005) In these levels, along with the inhumations, several other items were found, such as engraved bones, painted pebbles and various ornamental elements (Barra, Grifoni Cremonesi, 1991; Serradimigni *et al.*, 2012).

Among the Paleolithic ornaments are several *Glycimeris sp.* mollusc shells processed to obtain half-moons engraved with linear motifs. In 1999, three of these half-moons (See Figure 1) were analysed by M. Bisconti with the aim of reconstructing the operational chain related to their production: the hypothesis was that the half-moon was initially detached from the shell, producing the engravings in a second step which was followed by the polishing and the colouring of the object with red ochre (Bisconti, 1999, p.41).

Starting off from the operative chain proposed by Bisconti, during an MA course of Experimental Archaeology at Sapienza University of Rome, an experimental protocol was devised that led to the realisation of two half-moons both made on shell: during the process, it was possible to confront problems and questions that led to the proposal of a new operative chain that partly confirms and partly modifies the one individuated by Bisconti in 1999 (Bisconti, 1999, p.41).

Materials and Methods

The experimentation was carried out using shells of *Glycymeris sp.* collected from the beaches of the Roman seacoast. A flint pebble, as a striker, and a stone anvil were used to

detach the half-moon from the shell (See Figure 2, B-C). The incisions were made with flint chips, to which the active edge had to be sharpened during the experimentation (See Figure 2, A). Red ochre was used for colouring, which was inserted into the incisions with the aid of a wooden stick.

While performing this protocol, it was of great importance to have prior knowledge and experience with this material, indeed the author had made necklaces from shell before. The fragility of the raw material and the high probability of breakage was therefore considered. For example, the necessity of placing the shell on a support (which in that case had been a sponge) to prevent it from breaking in half when hitting it, could have happened in the past. So, during the experimentation, in order to detach the half-moon from the shell, it was deemed necessary to proceed with light blows on the ventral part, using a stone support on which to place it. For the engraving phase, an attempt was made to follow the operational chain proposed by Bisconti (1999), which involved engraving before polishing. But, after several attempts, it was preferred to polish it first, to make the subsequent engravings easier to create.

For the colouring of the artefact, it was decided to proceed in two ways: first, by inserting ochre diluted with water directly into the grooves and secondly, by scattering the entire body of the half-moon with ochre. Two different types of colouring were tested as, when analysing the description of the half-moons in Grotta Continenza (Bisconti, 1999, p.41), the question arose as to whether the colour was inserted only into the grooves of the incisions or whether it originally covered their surface entirely.

Overall, the time taken for the manufacture was short: the first shells were worked in about 50 minutes; the others, once the gestures were understood, they were completed in less than 30 minutes.

The process was documented with photos and videos taken using an iPhone 12.

Results

The experimentation carried out can be divided into three phases: one, detaching the half-moon from the shell, the second one of smoothing and incision-making, the third one of colouring with red ochre.

Step 1- Detachment of the half-moon: the shell was placed on the stone anvil, and then light blows were inflicted on the ventral part starting from the umbo (See Figure 3, A-B). From the middle part of the shell body onward, the processing required more care and caution to prevent the samples from breaking in half, making it impossible to produce a finished object.

Step 2 - Polishing and making engravings: once the half-moons were obtained, an attempt was made

to engrave and then polish them following Bisconti's hypothesis (Bisconti, 1999, p.41). However, since the surface was smooth and slippery, engraving was problematic - the grooves could not always be directed as intended. Therefore, it was preferred to proceed with polishing at first: the half-moons were first rubbed on the surface of the stone used as an anvil in the previous phase (See Figure 4, A-B), and then refined with the use of sand, rubbed with fingers. Once the body of the half-moon was no longer slippery, the incisions were made with the help of a flint tool, making continuous movements from top to bottom (See Figure 4, C-D) and trying to make incisions as similar as possible to the original ones.

Step 3 - Colouring: after combining water with ochre powder, the resulting paste was applied in two ways: either by placing the ochre directly on the carvings with a wooden stick (See Figure 5), or by completely dipping the half-moon in the paste.

The finished artifacts (See Figure 6) were photographed and, after two weeks, re-examined: the sample in which the ochre had been scattered over the body showed bright red colour only in the incisions, in the other areas the colour was still present but less evident. It is probable that, if this half-moon was buried and unearthed in hundreds of years, the ochre would be visible in trace only in the grooves.

Discussion and Conclusions

Half-moon production in the Upper Palaeolithic must have been a speedy activity, with minimal special skills required, apart from a lot of patience and some manual dexterity: anyone within the group could attend to it, perhaps the children as well.

The work provides an initial moment of detaching the half-moon from the shell, in this case gradually breaking the surface with the use of a pebble as a striker and a stone percussion plane. Next, the valva was first smoothed and then engraved, inverting the operational chain proposed by Bisconti in 1999. (Bisconti 1999, p.41). Some difficulties were encountered at this stage: it was complicated to best direct the engravings and make them all fit into the same "track", although for the people of the time, who probably had different manual abilities than ours, this problem might not have occurred. Finally, the grooves were filled with ochre using two different techniques: first, by directly inserting the colour into the lines; second, by completely covering the surface of the shells.

A few weeks after the experimentation, it was noticed that the ochre-covered half-moon was gradually losing colour in the non-engraved parts. The datum is interesting: to find ochre in incisions (or in abraded areas) does not necessarily testify to the presence of colour only in these. The possibility that the pigment was scattered over the entire body of the artifact and came to us preserved only in the grooves due to post-depositional phenomena cannot be ruled out.

The experimentation carried out proved useful in defining the mode of production of the half-moons and reconstructing their operational chain. This study, despite being based on a Palaeolithic context, can also be applied to the analysis of the artefacts dated to later periods of prehistory.

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Keywords decoration

Country Italy

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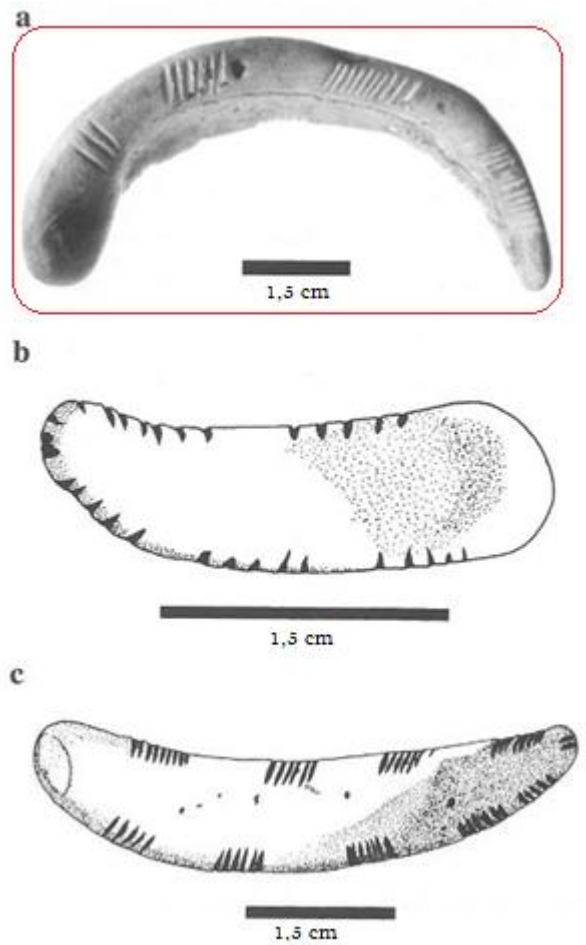

FIG 1. HALF-MOONS ANALYZED BY BISCONTI. THE BLACK BAR CORRESPONDS APPROXIMATELY TO 1.5 CM (MODIFIED BY ANNAMARIA DANIELE FROM BISCONTI, 1999, P.40)

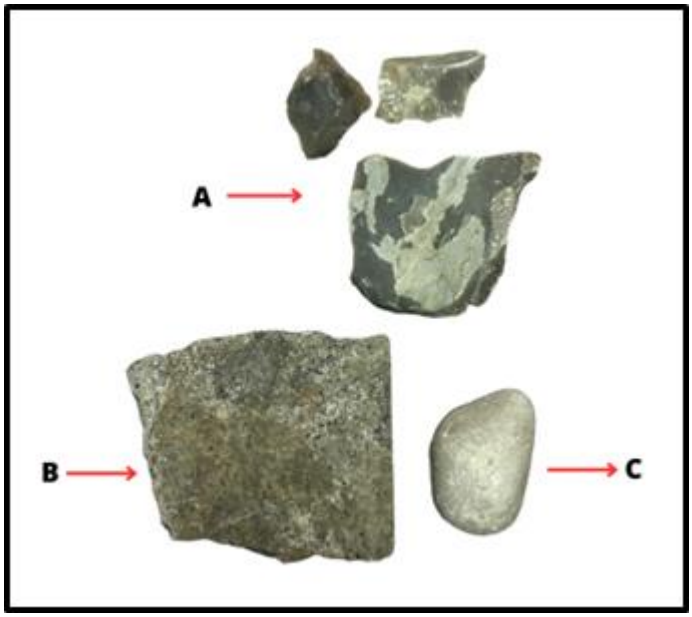

FIG 2. A) FLINT TOOLS WERE USED TO MAKE THE CARVINGS; B) POROUS STONE ANVIL, C) FLINT PEBBLE USED AS A STRIKER. IMAGE BY ANNAMARIA DANIELE

FIG 3. PHASE 1 - A) SHELL ON ANVIL READY FOR STRIKING; B) FIRST DETACHMENT; C) SOME HALF-MOONS MADE. IMAGE BY ANNAMARIA DANIELE

FIG 4. A-B) MOMENTS OF SHELL SMOOTHING; C) ENGRAVING THROUGH THE USE OF A FLINT TOOL; D) HALF MOON WITH FINISHED ENGRAVINGS. IMAGE BY ANNAMARIA DANIELE

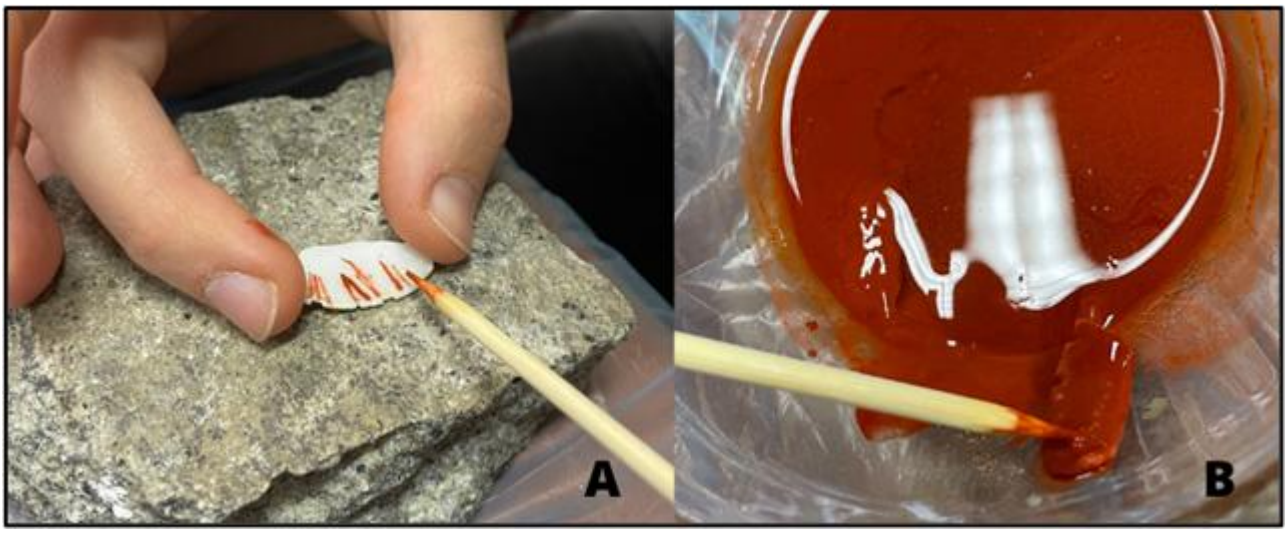

FIG 5. A) ADDITION OF OCHRE IN THE GROOVES OF THE INCISIONS; B) SUBMERGING THE HALF-MOON IN THE OCHRE PASTE. IMAGE BY ANNAMARIA DANIELE

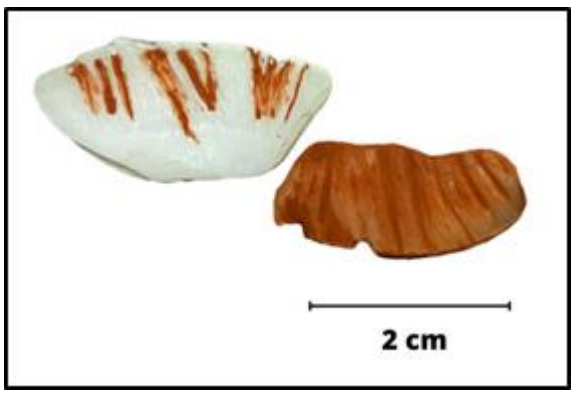

FIG 6. THE TWO FINISHED HALF-MOONS. IMAGE BY ANNAMARIA DANIELE