Title: **The bead workshop at site MPS4, Mil Plain, Azerbaijan: Craft specialization and the manufacture of shell jewelry in the Neolithic**

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THE BEAD WORKSHOP AT SITE MPS 4, MIL PLAIN, AZERBAIJAN: CRAFT SPECIALIZATION AND THE MANUFACTURE OF SHELL JEWELLERY IN THE NEOLITHIC

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Abstract: The paper presents preliminary results from a study of shell material at the Neolithic site of MPS 4 in the Mil Plain, southwestern Azerbaijan. The archaeological remains indicate production of a distinct type of disc bead from one shell species of the *Didacna* genus. Moreover, they allow a closer look at manufacturing techniques and raise questions about craft specialization as well as the presence of a long tradition of shell jewellery in the Circumcaspian region.

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Personal ornaments have until recently received little attention from archaeologists. In studies and field reports on prehistoric material, they are often hidden away in categories like miscellaneous finds. This scholarly neglect has long obscured the important role that these apparent "non-utilitarian" objects used to play in prehistoric societies. Since their first appearance in the initial Upper Paleolithic in Eurasia (Kuhn *et alii* 2001; Álvarez Fernández, Jöris 2008), probably related to the spread of anatomically modern humans, ornaments have occurred in almost every culture across time and space.

The function of jewellery is limited not only to body decoration, as it can also serve more utilitarian purposes like counting, or as an exchange of valuables (e.g., Eichhorn 1916; Malinowski 1922; Paravicini 1942–1945; Connell 1977). Adorning the body in itself not only enhances the appearance of a person, but plays an important role in the visual communication of social information (Kuhn, Stiner 2007). Ornaments serve to express aspects of the wearer's identity to several audiences.

Jewellery can be used to express social identity and group affiliation, such as gender, kinship, marital status, or to mark rites of passage (Dubin 1987; Clark 1986). The most common function of personal ornaments is probably their use to express status and wealth of the wearer. Furthermore, jewellery items can be used for healing or have an apotropaic function, and can serve as ceremonial objects, as they are still used today in esoteric circles and modern religions.

The symbolic value and meaning of jewellery items is based on a number of factors. The physical attributes of the raw material, like its color, lustre and durability, can determine the value of an ornament (Clark 1986: 82). Meaning can be attributed to materials based on their origin; for instance, sea shells are often associated with water and the powers of the sea (Orchard 1929: 17; Trubitt 2003: 244), and teeth and bones are often associated with the animal species they belonged to (Miller 1997: 234).

Besides the value and symbolic meaning attributed to the material itself, a second determining factor is an awareness of *investment differential* (Kuhn, Stiner 2007: 49), the represented "cost" or the amount of human time and effort spent in the production of an ornament. This is manifest in the sheer quantity of objects, especially with beads; in the costs of manufacture, highlighting the degree of skills employed by the craftsman, as well as the scarcity of the items used, as rareness and exoticness add to the value and allow use of the item as a status marker.

Another important topic apart from function is the distribution and manufacture of ornaments in prehistoric socie-ties. In this perspective, the study of jewellery can shed light on the socio-economic nature of the communities that made it and wore it. In this regard, the Neolithic period deserves particular attention as it marks important changes in economies and in social organization that also correlate to a vast expansion in technology. As in all other fields of production, Neolithic ornament production was necessarily affected by these processes, as indicated by the much wider use of materials, techniques, and forms of adornment that have been attested for this period compared to earlier ones (Wright 2012; Musche 1992).

Any study of ornament technology should not be limited to materials and techniques. The archaeological record can provide information on individual artisans and on the social organization of ornament production. Individual skills and choices made by ornament makers can be illuminated through the perspective of *chaînes opératoires* (Dobres 1999; Martinón-Torres 2002). A study of ornament production can provide clues to the degree of craft specialization in the Neolithic. Currently, only a few technological studies of Neolithic ornament manufacture have been carried out and ornament pro-duction areas have seldom been recorded (Wright, Garrard 2003; Wright *et alii* 2008; Miller 1996). One such rare case is a bead workshop at the Neolithic site MPS 4, investigated since 2010 in Azerbaijan (Lyonnet *et alii* 2012: 48–50; for more detailed investigations, see Heit 2013). The rich material record from the workshop allows a deeper insight into shell-bead production techniques; moreover, it raises general questions with regard to the role of shell ornaments and craft organization in the south Caucasian Neolithic.

THE ANCIENT KURA PROJECT AND SITE MPS 4

Investigations in the Mil Plain, located in the triangle formed by the confluence of the Kura and Araxes rivers and the foothills of the Lesser Caucasus in south Azerbaijan, began in 2009 with excavations at Kamiltepe.[1] Intensive surveying of the immediate surroundings led to the discovery of a series of small flat or low mounded sites dating to the Neolithic age, among them, site MPS 4 [*Fig. 1*], located 700 m from Kamiltepe. The site has been excavated since 2010. A trial trench dug to test for underground channels exposed one half of a round subterranean house and a deep V-shaped ditch. The second half of the house was uncovered subsequently. Radiocarbon dating of the occupa-tion produced calibrated dates around 6000 BC, making site MPS 4 the earliest known Neolithic site in southwestern Azerbaijan (Lyonnet *et alii* 2012: 13). Within the regional framework, MPS 4 seems to be contemporary with the Shulaveri–Shomutepe culture in the middle Kura basin and the Aratashen culture in the Ararate plain, which are both representative of the Late Neolithic in the southern Caucasus (Arimura *et alii* 2010).

MANUFACTURING *LOCUS*

Geophysical surveys and excavations at the site exposed a system of four concentric ditches containing built-in mud-brick walls. The only domestic architecture excavated so far is a round subterranean pit-structure with a diameter of about 3 m [*Fig. 2*]. The house-pit is bell-shaped and dug into the natural ground to a depth of at least 1.10 m. The walls on the eastern side were reinforced with a row of hand-shaped mud bricks and the floor consisted of at least four layers, all in all about 10 cm thick. Remains of inner architecture include a small pit with ashy deposits, without any artifacts, in the southwestern area of the house-pit, which cuts through the upper floor layers. Two shallow pits, between 24 and 28 cm in diameter, were found in the lower floor horizon in the northwestern and northeastern area of the house-pit. The northwestern pit contained a large amount of chipped stone pieces and shell material. The northeastern pit connected to a wall niche where a hammerstone and some larger chipped stone pieces were found, hinting at its probable use as a storage facility. The second installation identified so far was a kind of irregularly shaped *pisé* platform about 10 cm thick, which was set on top of the upper floor layer in the central northern area of the house-pit. No hearth remains could be detected, although ashy deposits indicated fire-making activities in or around the structure.

Excavation of the eastern half of the round structure in the first year yielded

[1] Work in the Mil Plain is a collaborative effort of the German Archaeological Institute, the Azerbaijan National Academy of Sciences and the Baku Institute of Archaeology and Ethnography. Research has proceeded since 2010 as part of the "Ancient Kura" project focused on the human interaction with the environment from the Neolithic to the Bronze Age. For the Mil Plain, see Aliyev, Helwing 2009; Helwing *et alii* 2012; Ricci *et alii* 2012; for an initial comprehensive report on the "Ancient Kura" project, see Lyonnet *et alii* 2012).

Fig. 1. Localization of site MPS 4 in the Caucasus (After Arimura et alii 2010: Fig. 1)

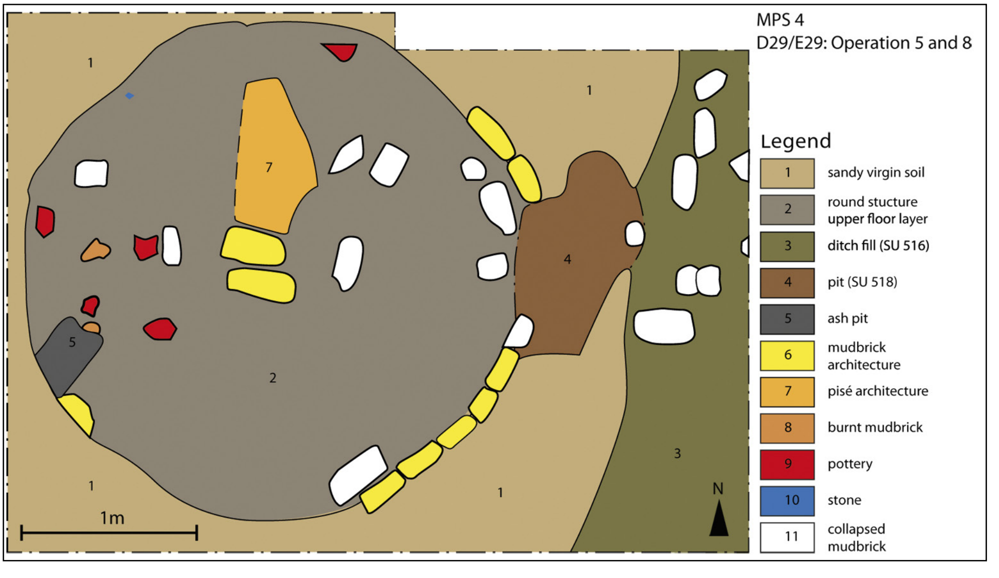

Fig. 2. Plan of the semi-subterranean round structure (Photographic Archives, Mil Plain Expedition, DAI)

a quantity of shell fragments together with microlithic flint artifacts in the floor layers. Dry-sieving of the excavated soil through a 3 mm mesh resulted in a tenfold increase in shell and flint artifacts — altogether more than 3700 pieces — in the following campaign. Shell fragments and microlithic flint artifacts were found also in the fill of the house-pit. Floor layers in the remaining western half of the house-pit were excavated in a 50 cm by 50 cm grid system in order to study spatial distribution. A spatial and stratigraphic analysis of bead workshop-related microartifacts has led to several observations concerning the spatial and temporal use of the round structure for bead manufacture.

Quantities of shell fragments and microlithics occurred in all the floor layers. Bead making was apparently not a singular event, but was rather carried out in the same place over a long time span. Micromorphological analysis of floor sequences (Lyonnet *et alii* 2012: 35–36) revealed frequent replastering that pointed to a multi-annual use of the round structure. Larger densities of artifacts related to bead-working in the second and third floor sequences indicated an intensification of bead production in the middle dwelling phase.

Some similarities could be observed in the horizontal distribution of shell fragments and microliths throughout all four floor-layer sequences, whereupon the largest artifact densities were located in the middle and northern area of the round building. This distribution indicates that the specific place of manufacture was not moved considerably during the occupation of the building. The *pisé* platform revealed on top of the upper layer in this area could also have been used for manufacturing purposes, as there is an increased amount of shell and lithic debris embedded in the floor layer around it.

The spatial distribution of shell fragments coincided more or less with the distribution of debris of flint tool manufacture, suggesting that both bead and tool production were carried out in the same working area.

CHAÎNES OPÉRATOIRES OF SHELL BEAD PRODUCTION

The total amount of shell fragments retrieved from the round structure is 3766. All the shell are of a single species of the *Didacna* genus, either *D. pyramidata* or *D. praetrigonoides* (T. Yanina, Moscow State University, personal comunication) [*Fig. 3*], a marine shell inhabiting the Caspian Sea. The finished beads constituted only 0.5% of the total amount of shell objects [*Fig. 5*]. There were about 3% preserved blanks additionally, while unretouched blanks also included roughouts as a pre-stadium form. About 20% of the shell artifacts showed manufacturing failures (blanks broken while retouching, drilling and polishing). Waste material was the most numerous in the record.

Based on a study of working traces on unfinished shell beads and manufacturing failures, four major steps were distinguished in the production process. These are: 1 – chipping the shell, 2 – producing the bead blank, 3 – perforation by drilling, and 4 – grinding the edges [*Fig. 4*].

The **first step** was to chip the shell in order to obtain smaller pieces for making bead blanks. During this step, over 76% of the shell artifacts were produced as debris, characterised by no traces of secondary working, such as retouching and polishing of the edges or drilling. Unworked shell debris was found in all shapes and size; fragments larger than one centimeter were uncommon.

The shell debris material contained about 200 pieces of rectangular shape with straight edges, which mostly belonged to the outer lip area of the shell valve [*Fig. 5:3*]. These pieces indicate that chipping could have taken place not only with a direct, but also with an indirect punch: the use of the latter technique allows better control of the chipping and leaves straight break-lines, whereas chipping the shell with a direct punch results in conchodial fracture as confirmed through experimental testing. Some flat flint fragments showed hammering traces on the opposed edges. These *pièces esquillées* could have been used as chisels during this operation.

After chipping, the **second working step** was the production of bead blanks from selected shell fragments of an appropriate size. Two different processing sequences could be traced for this working step. In the first one, the shell fragment was drilled immediately without any preceding edge modification. In the second one, the angles of the roughout were round-retouched with a pointed tool [*Fig. 6:4*]. A total of 611 (74.88%) completely preserved or broken fragments featured retouched edges, whereas 205 blanks were processed without edge-rounding.

Except for the *umbo* [*Fig. 6:1*], the knoblike prominence near the hinge that was too buckled for making a flat bead, the entire valve surface was used for bead production. The vast majority of shell fragments with secondary working traces (86.39%) were taken from the flat middle part of the valve, which seems to be better suited for bead production compared to the brittle lip area and bent dorsal part. In view of the fact that the latter parts were also used for beadmaking (though to a lesser extent), the bead artisans on MPS 4 can be said to have made highly economic use of the raw

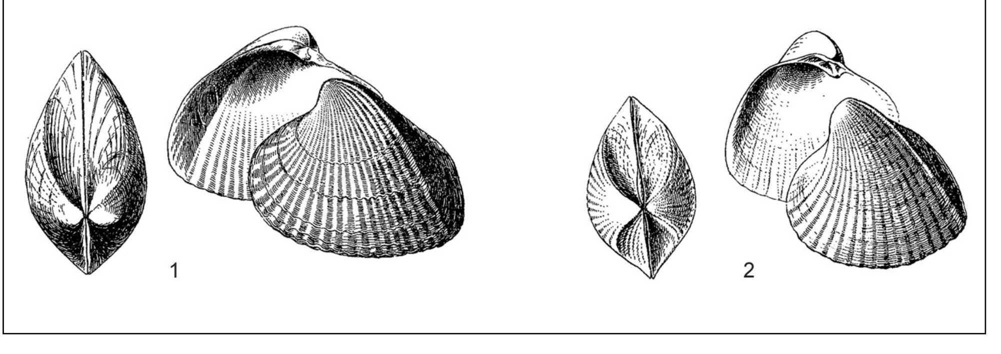

Fig. 3. Didacna shells as raw material for bead production: 1 – D. praetrigonoides; 2 – D. pyramidata (Modified after Longvinenko, Skorobogatov 1968: Figs. 343,2, 344,1)

material. Probably if shell became scarce, the artisans tried to utilise also shell fragments less optimal for a bead production.

In the **third step,** the blank was perforated by drilling. This operation seems to have been the most risky, due to the large number of manufacturing failures (about 55.15%) among fragments with secondary working traces. 614 shell fragments (16.35%) bear perforation traces. Generally, drilling was initiated in the middle of a blank without any previous scoring for keeping the drill in place. Only in 19 cases was the perforation initiated off-center and then not completed. This shows that a nearly regular round disc bead was intended in all cases. In 97% of the cases, the perforation was performed from the shell interior, while only 13 shell fragments were perforated from the exterior. The latter are mostly lip fragments which have ribs on the inner side that interfered with getting the drilling started.

According to blunt drilling sections on broken blanks [*Fig. 7*], the drills appear to have been short and quite thick. The drilling diameter of completely perforated holes ranges from 1.4 mm to 3.4 mm. In only two cases, the drilling was done from two sides where the bit was apparently too short to perforate a thick

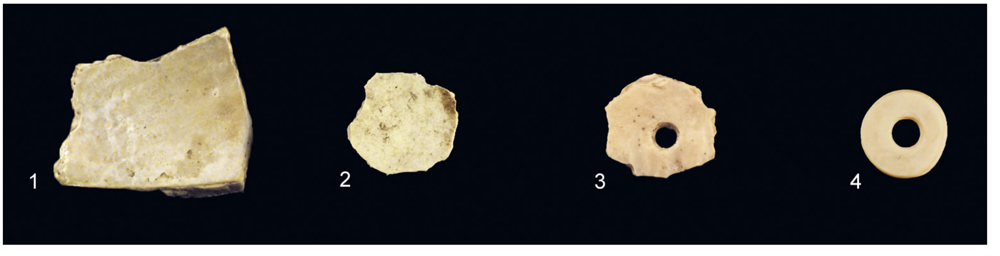

Fig. 4. Bead manufacturing sequence: 1 – chipping the shell; 2 – producing the bead blank; 3 – drilling; 4 – grinding the edges (Photographic Archives, Mil Plain Expedition, DAI)

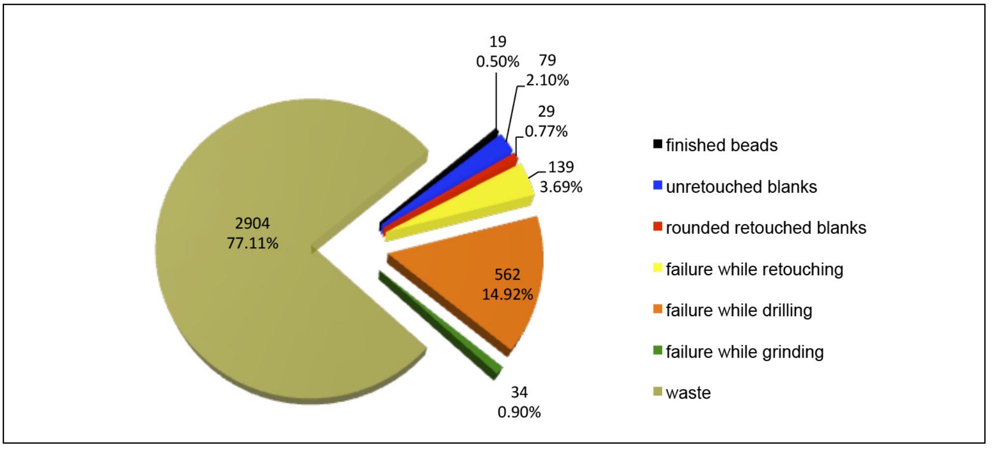

Fig. 5. Frequency of finished beads, unfinished blanks, manufacturing failures and waste at MPS 4

shell blank in a single operation. After the blank was drilled through, the drilling was usually done again from the exterior in order to smooth out irregular edges of the hole.

The perforations usually have a symmetric shape with concentric macroscopic working traces in the drilling profile which indicate use of a bow drill rather than a hand drill as seen in similar results

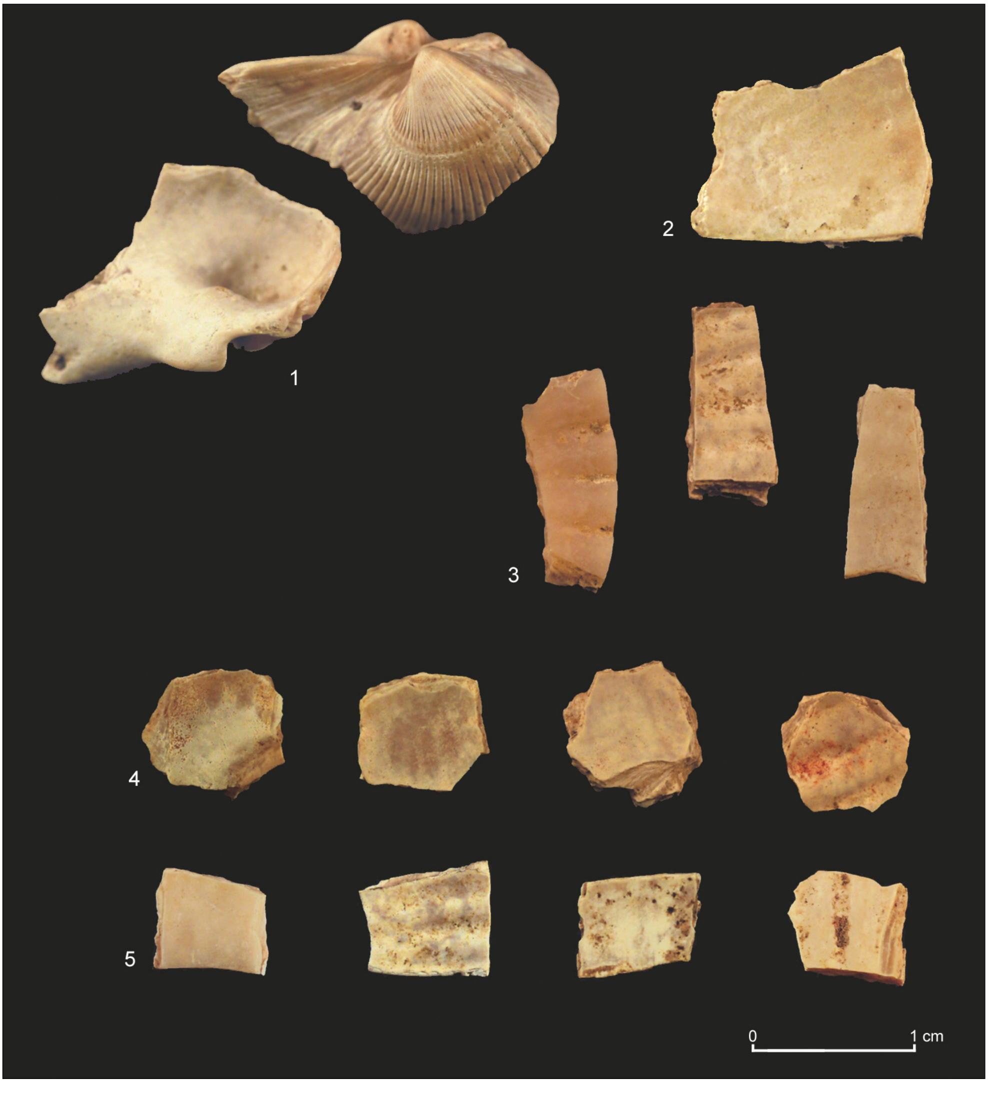

Fig. 6. Shell debris and bead blanks: 1 – discarded umbo part; 2 – large shell fragment; 3 – regular-shaped shell fragments of the lip area; 4 – bead blanks with edge round-retouching; 5 – bead blanks without edge round-retouching (Photographic Archives, Mil Plain Expedition, DAI)

of experimental drilling investigations (Gwinnett, Gorelick 1981: 22; Coşkunsu 2008: 33; Foreman 1978).

The drilling tools consist of microdrill bits made exclusively of flint. Although obsidian is represented by 8.78% of the stone assemblage recovered from the house-pit, flint was obviously preferred for drilling. Experimental drilling with an obsidian and flint drill bit proved that the latter was more efficient due to its greater hardness (Altinbilek *et alii* 2001).

The flint assemblage recovered from the house-pit contained 1855 (88%) flakes and debris without secondary modification apparently resulting from microdrill production. The tools associated with drilling activities were the most numerous, comprising 194 artifacts. Of these, 175 microdrills are completely preserved. In most cases, the points were blunt due to abrasion [*Fig. 8:2*]. Only two microdrills have completely unabraded points [*Fig. 8:1*]. Some tools also had remains of

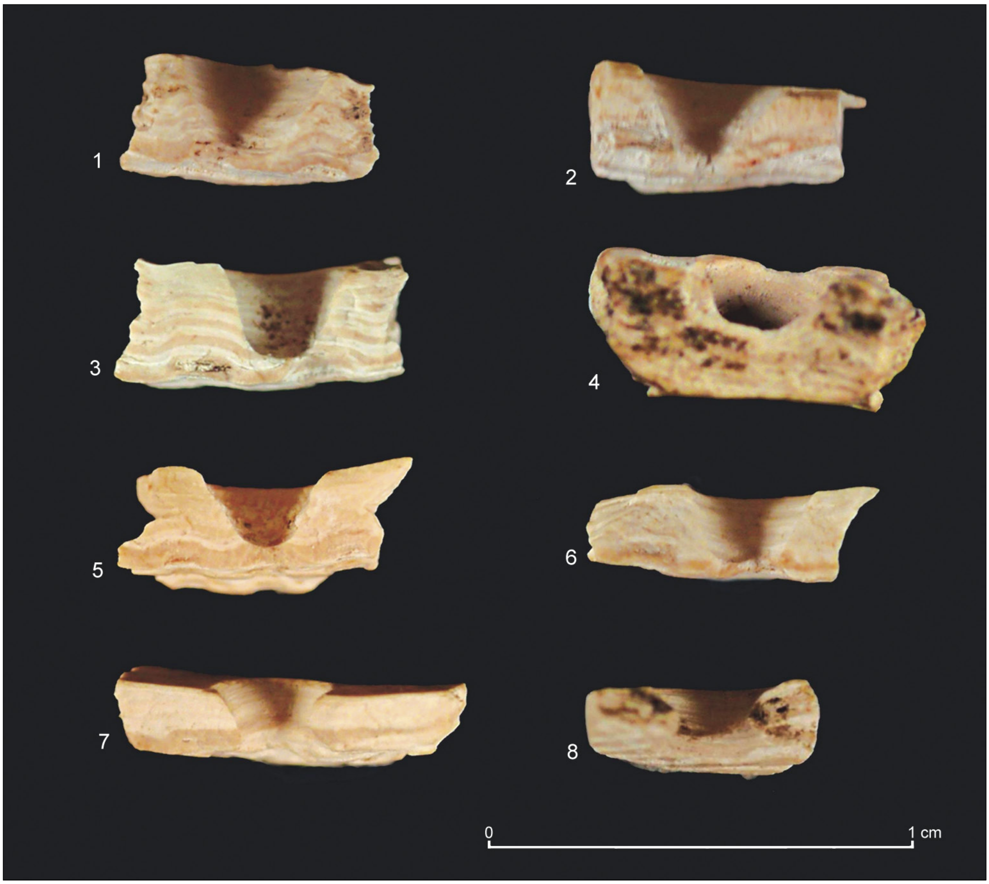

Fig. 7. Drilling sections: 1–6 – uncompleted perforation from inside; 7–8 – completed perforation from inside, redrilled from outside (Photographic Archives, Mil Plain Expedition, DAI)

white powder in the cleavages deriving from shell abrasion [*Fig. 8:4–5*]. Other drilling tools included microdrills with broken points [*Fig. 8:3*], microdrill blanks and one large drill point [*Fig. 9:13*]. The amount of non-drilling tools is comparatively low and includes 43 retouched flakes, 11 *pièces esquillées* and 10 microblades.

The raw material mostly belongs to the main three flint varieties of pinkish, greyish and brownish colour, which seem to be of local origin. These flints are quite coarse and brittle and have poor flaking properties. Experimental flaking on flints found in the vicinity of the site provided only short and irregular flakes. Only a few

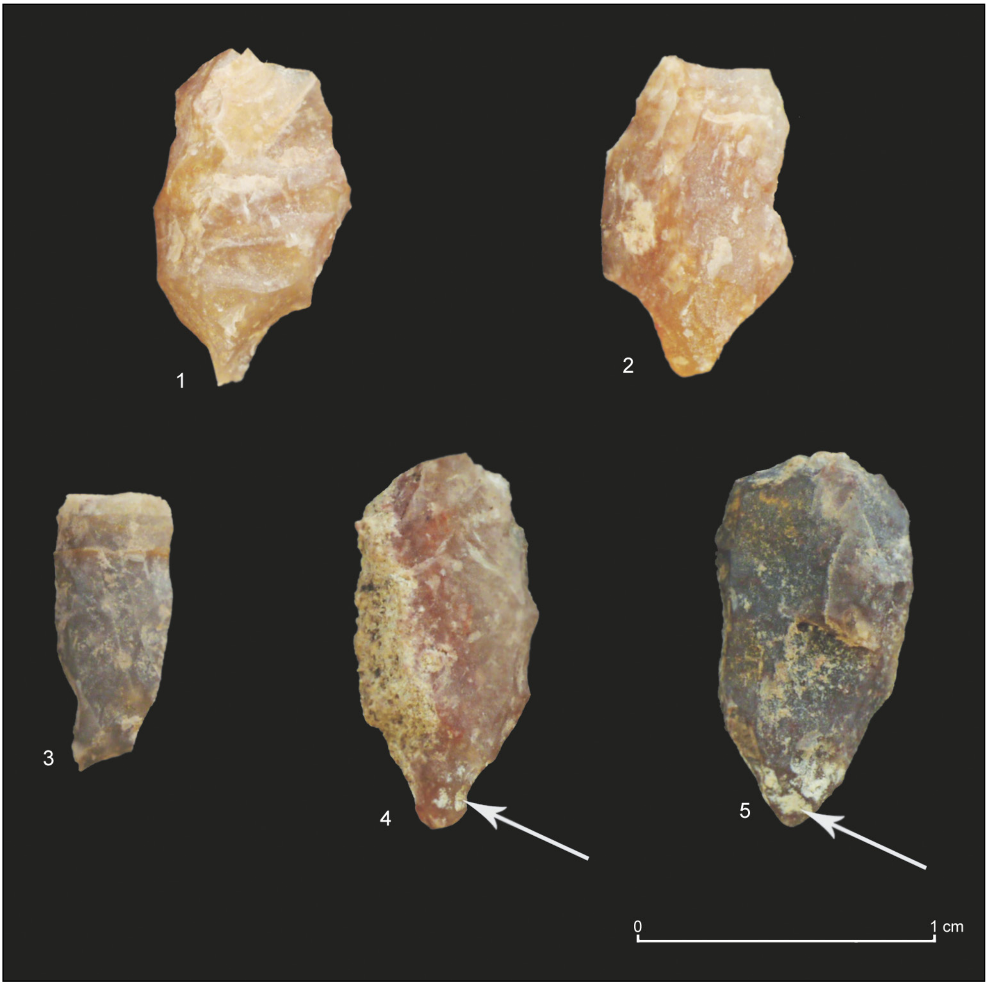

Fig. 8. Drilling tools: 1 – microdrill with an unabraded point; 2 – microdrill with an abraded point; 3 – microdrill with a broken point; 4–5 – microdrills with remains of calcareous powder on the working points (Photographic Archives, Mil Plain Expedition, DAI)

could be used for further modification. Exogenous flints of whitish, chocolate and honey colour occured only singularly.

The short and sometimes thick microdrills [*Fig. 9:1–12*] are based on flakes. They occur in heterogeneous, none-standardized shapes. Many have irregular retouch which reflected a rather opportunistic approach to drill production, geared toward manufacturing less

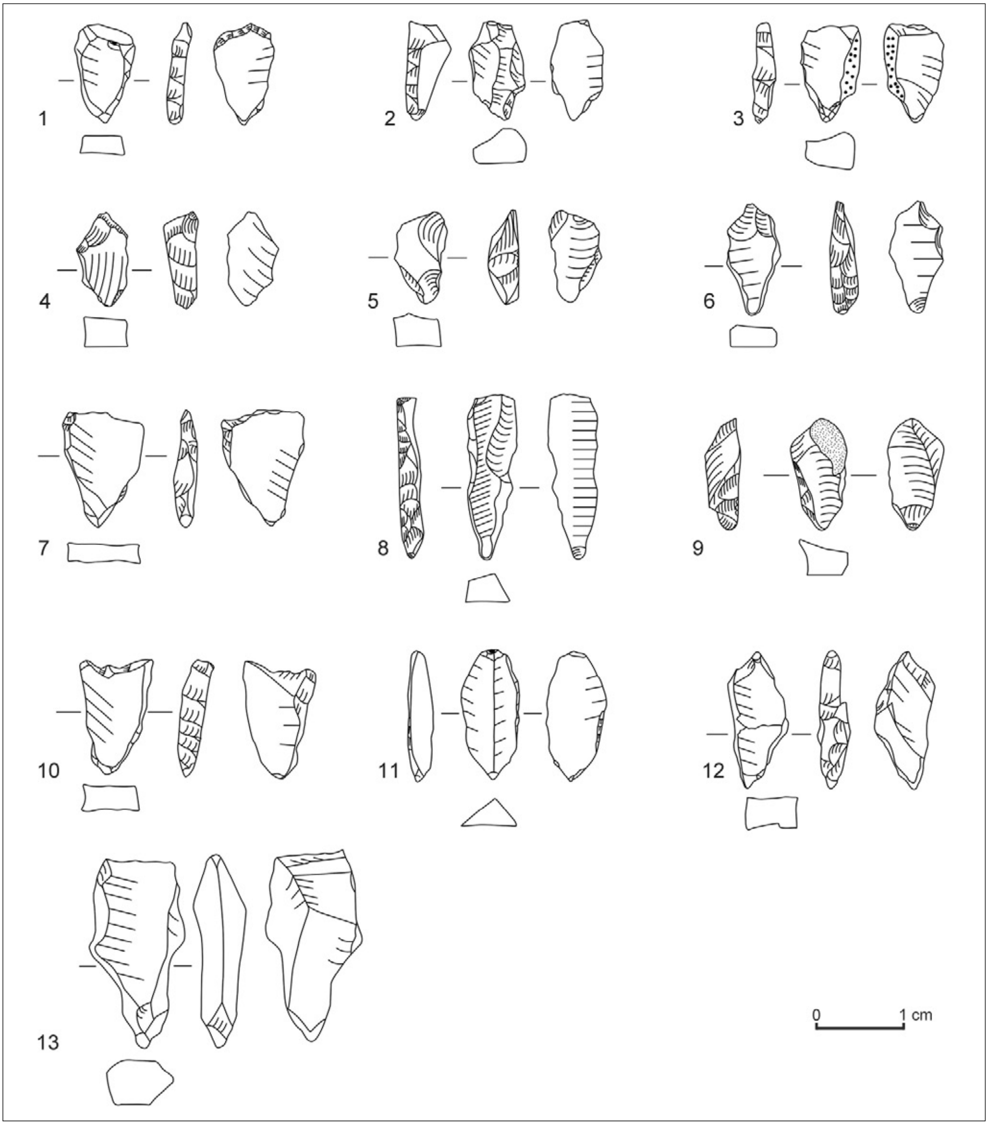

Fig. 9. Drilling tools: 1–12 – microdrills; 13 – drill point (Photographic Archives, Mil Plain Expedition, DAI)

elaborate tools with simple sharp points suited for drilling. Microdrills with steep continuous bilateral retouch were few.

In the **fourth and last step**, the edges of the blanks were ground to a smoothed circle. The risk of breaking the blank during this operation was not as high as in the previous step and there were very few manufacturing failures with traces of grinding. As shown by ethnographic and experimental records (Orchard 1929; Foreman 1978; Francis 1989), two general techniques can be applied in this process. By the first one, also called *heishi*-technique (Francis 1989), the bead blanks are strung together on a cord or sinew and ground

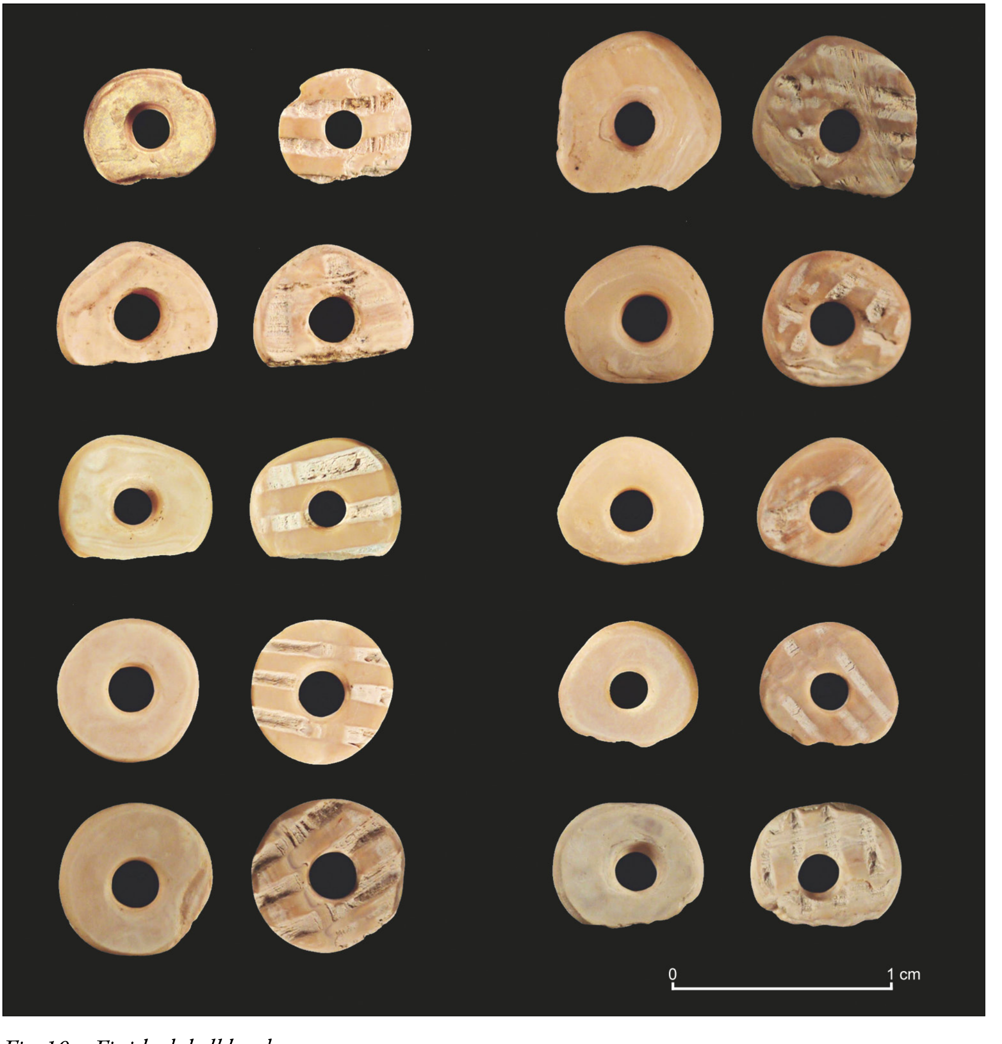

Fig. 10. Finished shell beads (Photographic Archives, Mil Plain Expedition, DAI)

at once. This way, the edges on the strung beads are ground to an equal diameter and the bead edges tend to a rectangular shape (Wright 2010: 22).

The second, more time-consuming method is grinding the beads one by one. According to a non-standardized diameter of the beads and edge working, this procedure has been postulated for Neolithic shell bead production at Franchthi cave (Miller 1997). This grinding method could have been applied at MPS 4, as there is a large deviation in diameter sizes upon the finished beads [*Fig. 10*], which vary between 5.8 mm and 7.5 mm while the edges of the beads have more rounded profiles.

MARINE SHELL AS RAW MATERIAL

The situation revealed at MPS 4 raises questions concerning the seemingly narrow choice of raw material and ornament type. The raw material is a sea shell species today found in the Caspian Sea at a distance of more than 200 km from the site. However, this situation does not necessarily reflect the conditions during the Neolithic period. The Caspian Sea level oscillates regularly and the ancient sea shore during the Neolithic was probably much closer to the Mil Plain than the modern one. Moreover, it is highly likely that the retreat of the sea left behind lakes or lagoons with brackwater that dried up only much later (Lyonnet *et alii* 2012: 123–127). Therefore, although they were certainly obtained at some distance from the site, it remains difficult to assess the distance from where these shells reached the Mil Plain.

What is beyond doubt is that the artisans of the bead workshop specialized in one specific shell species, although alternative materials of similar hardness like bone or soft stone must have also been available. Limestone is well-represented among the groundstone assemblage of MPS 4 (Lyonnet *et alii* 2012: 163–165). Bone tools as well as small clay finds indicate that bone and clay were also frequently used for production of various artifacts. So far, only one disk bead of similar size made of stone, as well as two cylindrical beads made of bird bone and a bone pendant have been discovered at the site.

The distance from the raw material sources and the observation that the shell valves were used for beadmaking in a very economic way contradicts any assumption that the abundance of material was the main reason why it was preferred. A comparable bead workshop is documented at the early Neolithic Franchthi Cave in the Aegean (Miller 1996; 1997), where differences in the bead making steps are obvious, although the same bead type was intended. There, the location directly on the Aegean Sea shore allows for a very extensive use of material; each whole valve of *Cerastoderma edule* species was used only for one blank.

Thus, the procurement of bead material for the Mil Plain workshop required either intentional procurement trips or engagement in the regional exchange networks of the Caspian region. It also appears that the molluscs were probably gathered alive as there are no traces of sand abrasion from wave activities on the shell surfaces. Therefore, it is more probable that they were deliberately sought and selected, rather than being gathered accidentally while walking along the beach.

Why were these shells used for bead production? There could be several explanations. The technical explanation involves the material properties of shell including lesser hardness than stone and thanks to its flat thin surface, greater facility than in the case of stone being worked into a flat disk shape, which requires advanced skills and wider range of manufacturing technologies (Twigger 2009: 281).

The non-technical explanations remain rather speculative. Was there any tradition behind the continuous use of shell jewellery? Vinogradov (1972) has noticed at least some evidence for the common use of *Didacna* shells in the southern circum-Caspian area in the early Neolithic. The site of Kuba-Tengir in Turkmenistan yielded a comparable shell bead workshop with quantities of finished beads and blanks, as well as waste material and drilling tools (Okladnikov 1949; 1953), which unfortunately could not be sufficiently excavated and published. The inventory from this site contains plenty of finished shell beads which seemed to have been deliberately deposited. Some shell beads were recovered *in situ* in alignments, probably representing ancient necklaces and numerous bead blanks were found as well. Besides Kuba-Tengir, shell ornaments were also found at sites lying at a greater distance from the sea (Vinogradov 1972). It is also possible that the shell ornaments at Kamiltepe were appreciated as prestige goods precisely because of their scarcity, or that there was a symbolic meaning attached to their wearing.

It should be pointed out that at the site of Kamiltepe, which is dated some 400 years later than MPS 4, only stone beads and no shell ornaments have been found so far. These indicate that although the use of shell as raw material for the jewellery was given up in a later period, beads continued in use as ornaments.

POSSIBLE CRAFT SPECIALIZATION AT MPS 4

The archaeological record from MPS 4 is an impressive example of Neolithic craft technologies that also include "non-utilitarian" branches such as personal ornaments. Did craft specialization occur already in this early period? A comprehensive theoretical study on craft specialization from an archaeological perspective with established criteria and typology of craft specialization has been conducted by Costin (1991). However, finding archaeologically detectable criteria of socio-economic craft specialization which are also applicable for specific periods like Neolithic is difficult. In regard to the problem of incompleteness in the archaeological record, Costin introduces identification of production loci as direct evidence (Costin 1991: 18–32) and standardization, efficiency and skill as indirect evidence of craft specialization which the study of material culture could trace (1991: 32–43).

In her study on craft specialization in the Anatolian Neolithic, Twigger (2009) adapted Costin's criteria of craft specialization to the archaeological evidence in the Neolithic in the sense that not proof but merely a possibility of craft specialization is expected within the limits of the archaeological record (2009: 84). Modification of raw materials, technical know-how, repeated production, the presence of fewer producers than consumers are among other criteria of possible craft specialization are applied and to a great extent fulfilled in detailed case studies on stone and shell bead production at Anatolian Neolithic sites of Pınarbaşı and Boncuklu Höyük (Twigger 2009: 280–288).

Another case study on Neolithic ornament production, revealing strong indication of craft specialization, was carried out on two PPN-sites: Jilat 13 and Jilat 25 in Jordan (Wright, Garrard 2003; Wright *et alii* 2008). Both sites were close to resources of Green Dabba marble and produced detailed evidence for stone bead manufacture in several stages with a high ratio of debris and unfinished material relative to finished products. On the evidence from Jordan, Wright *et alii* have suggested site specialization in the Pre-Pottery Neolithic with sites like Jilat 13 and 25 being possibily remote camps of hunter-herder corporate groups engaged in special activities involving production of personal ornaments (Wright *et alii* 2008: 154–157).

Craft specialization was also discussed in the case of the Neolithic shell bead workshop in Franchth-Cave, using Costin's indirect criteria of craft specialization (Miller 1996: 23–31; 1997: 152–164). In regard to efficiency, skill and output volume, Miller drew the conclusion that technical expertise and efficiency in production of shell beads in Franchthi was rather low, while labour investment was considerably high; hinting at the value placed on shell jewellery (Miller 1996: 28).

How is craft specialization hinted at in the ornament production at MPS 4?
The excavated area is still small and the round structure, where most of the shells came from, is the only dwelling structure uncovered at the site until now. Numbers may hence not be representative. In order to test, if there was only one bead workshop at the site and if the beads were not produced in every household, more dwelling structures need to be located and excavated.

In any case, bead production was intensively carried out in the round structure and continued without considerable interruption over several years during its use quantities of shell fragments that considering the were found in all of the floor layers.

As to the output volume of the MPS 4 workshop, it can be assumed that the 19 finished beads retrieved in the excavations are products lost here accidentally and that most of the finished products were transported and used elsewhere. The high amount of debitage and manufacturing failures provides indirect evidence for the original output volume and the 3800 shell fragments found in the round structure are apparently only a small part of the actual quantity of waste, as most rubbish was probably discarded elsewhere. Taking into account the economic use of shell material that leaves little waste, it is possible that thousands of beads were produced at MPS 4 during several years. With Miller's (1996: 17–21) experimental evidence on shell bead manufacture as reference, the average time invested into production of one disc bead would have been about one hour. In this regard, ornament production could have been routine work which made for a considerable part of the artisan's daily activities.

What can we say about artisan skills and efficiency in ornament production? The disc bead is probably the most universal and the most simple to produce among the modified ornament types. As there are no indications for production of other shell ornaments except disc beads and no hints at considerable deviations in the manufacturing sequence, the production process appears simplified and standardized. Drilling would be the most complex manufacturing step in bead production as it required special know-how in manufacturing drilling tools as well as trained skills in using them in order to avoid breakages during this risky operation (Twigger 2009: 281). Other working steps like grinding did not require a high level of knowledge in manufacture, but rather a greater time investment, so on the whole, bead production needed both – skills and the labour spent on it.

As was demonstrated above, the MPS 4 artisans were strongly specialized in a specific raw material. The most peculiar fact is that the raw material used for bead making was not of local availability. Shell was not imported as finished ornaments but was rather manufactured on site; its continuous procurement over the years – whether direct or indirect – would have required specialized logistics of material supply.

CONCLUSIONS

Site MPS 4 provides hints for a small-scale craft specialization with the production of one specific type of ornament in one place, which could supply not only one household but possibly also a small community. The specialization on one type of bead as the product and on one species of shell as the raw material is peculiar and intriguing, as other resources for producing different ornament types were certainly available. The narrow choice of the shell disc bead as a primary ornament could be explained by simplicity in production due to its common shape and advantageous material properties. On the other hand, the raw material had to be intentionally selected and procured from a certain distance to the site. This would contradict the idea of choosing the easiest and most convenient way of making jewellery and require alternative explanations. One of these could be a special value assigned to *Didacna* shells by Neolithic communities in the Mil Plain. Such behaviour would be in line with other areas around the Caspian Sea where Neolithic communities seem to have shared a specific shell ornament tradition.

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