

DECORATIVE TECHNIQUES ON POTTERY AT TELL HALULA (EUPHRATES VALLEY, SYRIA) IN THE 7TH MILLENNIUM CAL BC. CONTRIBUTION OF AN EXPERIMENTAL METHOD

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La aparición de la cerámica en el Próximo Oriente fue una de las novedades tecnológicas más importantes en el complejo proceso socioeconómico asociado al Neolítico de VII milenio. En el yacimiento de Tell Halula las primeras técnicas utilizadas fueron incisión e impresión, creando una amplia gama de patrones y motivos y estos han sido reproducidos mediante un protocolo experimental.

Cerámica Neolítica, Mitad VII milenio, Valle medio del río Éufrates, Pre-Halaf, Arqueología experimental.

The appearance of ceramics in the Middle East was one of the most important technological developments in the complex socio-economic process associated with the Neolithic in the seventh millennium BC. At the Halula site, the first techniques used were incision and printing, creating a wide range of patterns and motifs and these have been reproduced by an experimental protocol.

Pottery Neolithic, mid VII millennium BC, Middle Euphrates, Pre-Halaf, Experimental Archaeology.

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INTRODUCTION

The appearance and initial development of impressed and incised decoration on pottery in the area of northern Levant (Syria and Turkey) has been studied in order to characterise ceramic production during the seventh millennium (6900-6200 cal BC). At archaeological sites in this area, decoration has been one of the characteristics associated with the first pottery that has most been studied, as it is regarded as a cultural indicator of great potential.

This topic is here addressed with the Pre-Halaf assemblage from the site of Tell Halula (Euphrates valley, Syria) (Molist coord. 1996, 2013), where a full sequence covering the appearance and development of pottery has been found in a very complete stratigraphy (Fig.1). The study carried out by Josep Miquel Faura (Faura 1996a and b, 2013) demonstrated the existence of evolu-

tionary phases in the ceramic production and variable decoration according to its stratigraphic position. With this methodological basis, the decoration of the pottery has been studied in greater detail, particularly the ware with incised and impressed decoration (Faura 1996 a and b; Faura/Le Mièrre 1999; Faura 2016, Cruells et al. 2017). Incisions and impressions on ceramics provide evidence for fabrics tools in first pottery Neolithic of Near East (Tsuneki et al. 2017; Akkermans et al. 2006; Balossi 2006; Balossi/Frangipane 2002). This type of decoration shows that incisions and impressions can provide information on symbolic aspects (motifs, geometric sequences, etc) and the uses of different tools (lithic, bones, wood) infers in technologies and possible trading or cultural spread. In that sense traditional studies indicate that it was easier to describe and identify patterns in location, measure and type of motif but tools, combinations and position are still unclear for

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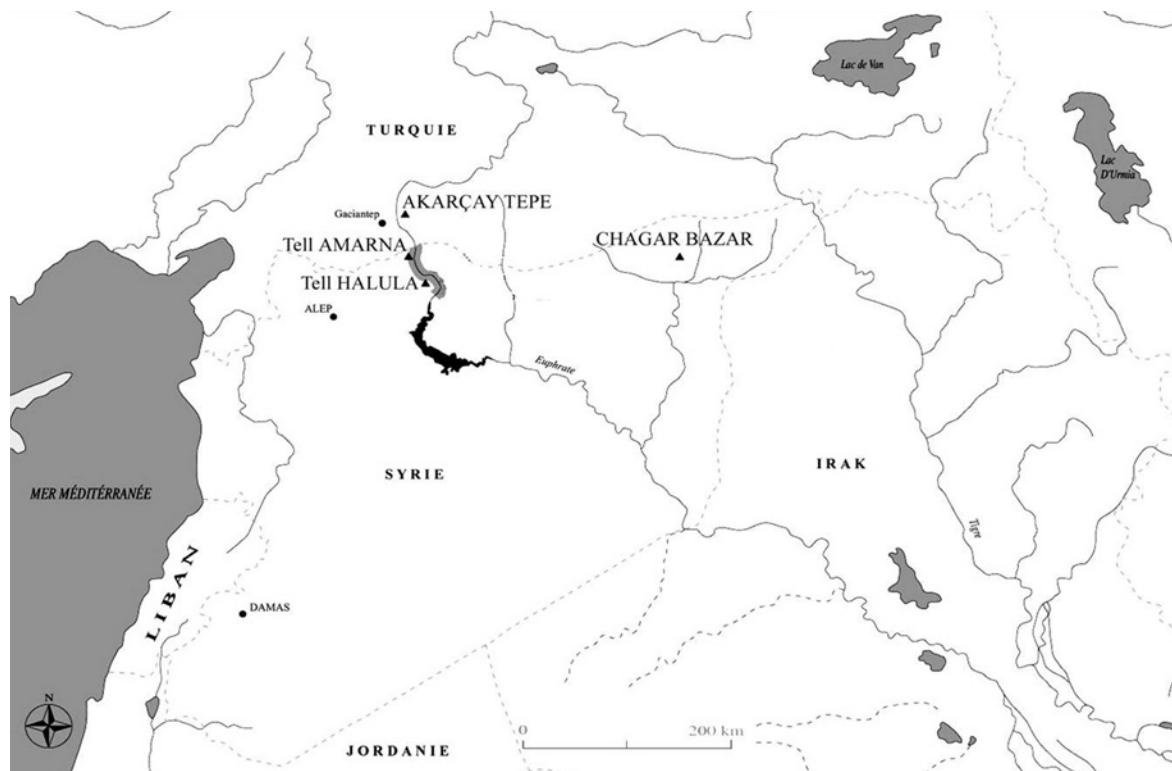


Figure 1. Near East Map with Tell Halula location.

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specific assemblages (Shepard 1976; Rye 1981; Rice 1987). But new studies try to go further in description and experimental approach even if only few of them are focused on Near East (Zuckerman 2000; Miller 2007; Hossein 2014).

Following the morphological and descriptive study of the decoration documented at the site of Tell Halula, an experimental protocol was designed in order to characterise the actions, motifs and tools employed in incised and impressed decoration.¹ The study thus aimed to approach the tools used to make the decorations.

TELL HALULA AND THE 7TH MILLENNIUM CAL BC POTTERY ASSEMBLAGE

THE SITE OF TELL HALULA

Tell Halula is located in northern Syria, about 150km northwest of Aleppo, in the “Fertile Crescent”. Research carried out at this site is proving to be of great importance within the study and updating of knowledge about the “neolithisation” process in the Near East.

It was a large settlement over 8 hectares in size, and the stratigraphy 11 metres thick attests prolonged and continuous occupation during nearly 2,500 years. The chronological sequence begins in the middle Pre-Pottery Neolithic B (c. 7700 cal BC) and reaches the end of the Halaf culture (c. 5400 cal BC) (Molist ed. 1996, 2013).

To document the seventh millennium occupations at Tell Halula, several areas have been excavated, some of them already studied and published (Sector 7, Sector 14, Sector 1, (Molist 1996, Faura 1996a, 1996b) and others partially published or being studied (Sector 30, Sector 2 Squares 2EF and 2G 2HI) (Molist ed. 2013) (Fig.2).

In the Pre-Halaf levels, particularly those in the upper part of the tell, the archaeological remains correspond to a domestic context, with a large number of structures corresponding to two types of buildings: rectangular or square houses (of the pluri-cell type) continuing the PPNB tradition, and the circular houses or *tholoi*, as they are usually called in the region.

In addition to the appearance of pottery, significant technical changes are seen in the chipped and pol-

1. The experimental study was carried out in the laboratory of S.A.P.P.O. (Seminari d'Arqueologia Prehistòrica del Pròxim Orient) in April and May 2012, and was based on the topics established for the European teams working in this line of research (Balossi 2006, Akkermans et al. 2006).



Figure 2. Pre-Halaf area S.30 at Tell Halula (Picture: Sappo-UAB)

ished lithic industries, in comparison with earlier periods. These variations affect both the procurement of raw materials and their management and final results. Lithic tools, for example, mostly consist of arrowheads, retouched blades, retouched flakes, burins and end scrapers, among other implements. These artefacts, together with the faunal remains and the carpological and anthracological record, demonstrate the practice of consolidated farmers and herders throughout the sequence. In addition, the stratigraphy, radiocarbon determinations and pottery studies have established that these occupations covered practically the whole of the seventh millennium (6900-6200 cal BC) (Molist ed. 2013).

The study of the typological and morphological evidence of the pottery, in combination with other artefacts and settlement patterns has been able to discriminate three main phases within this Pre-Halaf period (Faura 1996 a and b; Le Mièrre/Faura 1999; Faura 2013).

Phase I corresponds to the oldest level and is characterised by a specific pottery group called the “Black Series” owing to the black or brown colour of the paste. This contains calcite inclusions and the surfaces are polished. This group represents 44% of the pottery, whereas the other categories include pastes with plant temper and vessels with a finer paste and a polished finish.

In Phase II, ceramics with plant temper predominate, although the presence of applied clay decoration and some first painted productions are significant. Husking trays have also been documented and grey-black pastes attributed to the group of Grey-Black ware. The surfaces of these vessels display a burnished finish and some fragments are ascribed to the Pattern Burnish group. Incised and impressed decoration occurs, and some fragments of the earlier Black Series persist.

Phase III has yielded a more diverse ceramics assemblage. Despite the presence of productions with simple plant temper, which make up about 75% of the total series, other productions or series appear, such as the burnished red slip ware, and a new series of incised and/or impressed vessels. Some sherds of the Black Series are also documented, together with Grey-Black ware, red slips and, to a lesser extent, some fragments of Early Painted ware.

J. M. Faura’s study (Faura 1996 a and b, 2013) provided a detailed catalogue of the decorations existing in this Pre-Halaf sequence. This research, which has acted as our main source of information, discriminated five types of decoration as the most frequent: impression, incision, application of plastic clay, painting and polished motifs. These techniques may appear alone, or combined and mixed.

From the collection conserved in *Seminari d’Arqueologia*

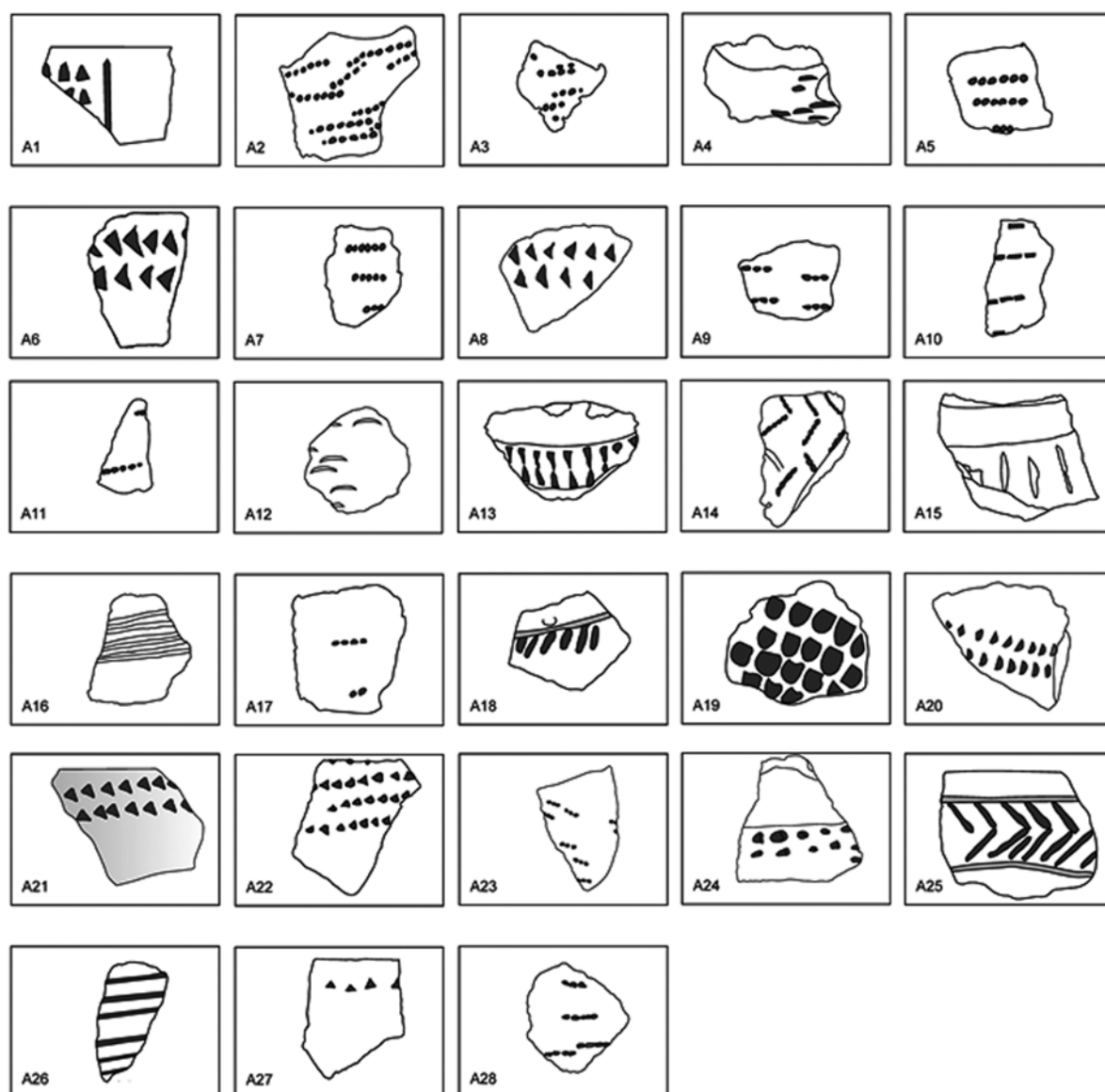


Figure 3. Pre-Halaf pottery collection from Tell Halula and main sherds used for the experimental archaeology.

Prehistòrica del Pròxim Orient laboratory, 28 fragments have been studied and each one has been defined according to the objectives of the present study (Fig.3). In this collection, impression is observed on 68% of the pieces, either digital impression (ungulate type) or using a comb (made of wood or bone). Incision appears on 18% of the pieces, using either continuous or discontinuous pressure and combined with impression, or with painting next to a line incised with continuous pressure. Excision appears on 3% of the fragments.

Therefore, impression is one of the most abundant dec-

orative techniques in the Pre-Halaf pottery at Tell Halula. It may be of three types: stamped or simple impression, impression with a roller, or rocking impression with a range of utensils.² This is the group that displays the greatest variability in the type of impression, closely related to the type of utensil used, or in the motifs and patterns. Macroscopic observation identifies large lenticular impressions (Fig. 3. A20), various lenticular dots (Fig. 3. A4 and A12), and dots with a semi-circular cross-section in an irregular pattern (Fig. 3. A24). Other fragments display impressions with a semi-circu-

2. The criteria of identification are the clarity of the motif, which is less marked by impression with a roller or by rocking, the possibility of recognising the trace of a known object or one that can be reconstructed by taking the form of the utensil from a trace, and sometimes a slight accumulation of clay that the impression of the utensil makes rise above the edge.

lar cross-section in lines, with a red slip covering the whole surface, and fragments with comb impressions, in which the number of teeth can be counted (three, Fig. 3. A9, A23; four, Fig. 3. A3, A17; five, Fig. 3. A11, A14, A28; and six teeth, Fig. 3. A5), and the shape of their cross-section can be identified (round, square...). Thus, there are impressions with a comb of three teeth with a square cross-section (Fig. 3. A10) and impressions with different forms of teeth (Fig. 3. A2, A7). Finally, impressions using a comb of seven teeth with a square cross-section create a herringbone pattern (Fig. 3. A25) or motifs of parallel lines (Fig. 3. A13).

These motifs may be in a disordered arrangement or, while disordered, bounded in rows defined by incisions (Fig. 3. A13, A25). Triangular impressions are also common, in diverse arrangements: in rows (Fig. 3. A27), in parallel lines (Fig. 3. A1, A6, A8, A21) or multiple lines (Fig. 3. A22), and in various sizes and positions. These may also be delimited by an incised band (Fig. 3. A1).

The next most common group at Tell Halula is represented by the incised technique. This was carried out by cutting the unbaked clay with continuous or discontinuous pressure. The results are hardly ever the same, as the form of the utensil, the action of cutting in relation to the curvature of the vessel and the state of the paste when making the incision can influence the shape of the cross-section. If the paste is moist, the relief is gentle and displays a raised edge, whereas if the paste is dry, the relief is sharper and the edges of the incisions are clean or with a crest.

The range of techniques and motifs is not very large in the incised decoration. In general the lines are more or less deep (Fig. 3. A16, A26). Decoration using the incised technique combined with other forms is less common. The most usual is the pattern of irregular parallel lines³ (Fig. 3. A15) and the combination of incisions forming two shallow vertical parallel lines below a horizontal line (Fig. 3. A18).

An example of excision is identified on a fragment of a globular container (Fig. 3. A19) by discontinuous linear pressure causing the removal of clay. Plastic decoration is also common, and defined as decoration with a clay element applied to the surface of the vessel. Although this form of decoration is not specifically studied here, some of the most usual motifs have been noted as this applied technique is very often combined with impression and/or incision and it is interesting to see how it was achieved.

It should finally be pointed out that slips, painting and the polished motif, which appear in combination with

the other techniques, but within a different *chaîne opératoire*, are not studied here.

In short, the ceramics assemblage in the Pre-Halaf phase displays great variety in the technical methods associated with the decoration on the vessels. These decorative groups appear in different percentages, and they all correspond to different groups of practices, although they repeat the decorative motif in general terms. Our special interest in the motifs produced with the impressed and incised techniques has allowed the determination of a wide range of techniques, motifs, sizes and utensils. The possibility of studying this variability through an experimental methodology was therefore of great interest.

OBJECTIVES AND METHODS OF THE EXPERIMENTAL PROCESS

Most of the experimental research in archaeology of the Near East is based on the ethnographic observation of communities and concentrates on describing activities and reproducing objects and artefacts. The first studies focused on generating relevant archaeological documentation appeared timidly in the 1980s in the Dutch School.

In the case of experimentation in pottery, it may be said that there is no agreed methodology, but the main research on manufacturing processes and firing techniques has resulted in archaeometric methodologies, whereas the reproduction of decoration has been studied less. In the present research, a mixed experimental method has been chosen, in which the documentation of archaeological objects has been the basis for the structure of the experimental process.

Thus, using a more empirical experimental approach based on the archaeological record, the present research has aimed to obtain information about the relationship between the archaeological evidence and the possible technical procedures and utensils used by communities in the Near East in the seventh millennium cal BC. It should be pointed out that little experimental research has been carried out on the decorative techniques used in this region, and particularly on impressed and incised decoration, as technological studies have tended to focus on the manufacture of the vessels rather than on their decoration.

In this case, the objectives prior to the experimental study of the Pre-Halaf ceramics assemblage consisted of characterising the impressed and incised production

3. An element that J. M. Faura called lightly incised parallel vertical lines on the inflexion between the body and neck of globular pitchers (Faura 1996a).

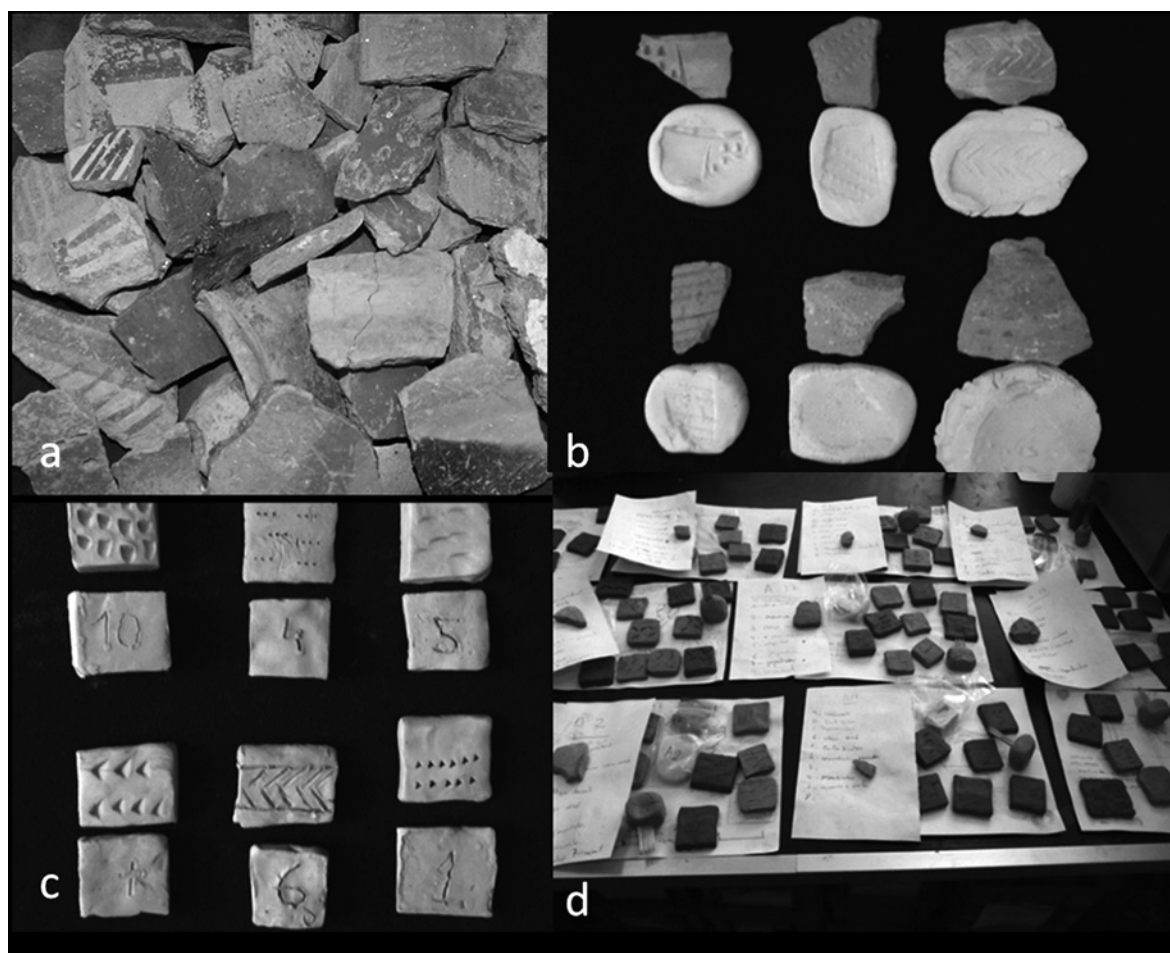


Figure 4. Process description: From sherds classification (4a), molds (4b), motif reproduction (4c) and data recovered (4d).

from the technological point of view. This aspect was complemented with the drawing up of an exhaustive corpus of the decorative motifs found at the site and the stylistic repetitions in order to approach the utensil and material used to decorate the pottery.

A further objective was to approach or infer the action used in the impression or incision of the decorative motif and identify technological recurrences employed by the artisans within a community of practices.

Finally, the ultimate goal of the research was to identify community of practices among the different technological groups used to produce the same decorative motifs.

The experimental protocol set out to reproduce the 28 fragments that have been studied (see Fig. 4) in a process involving six steps:

Production of a database with the fragments, documenting the decorative motifs, their size and position in the vessel, by drawing and digitalising them (Fig. 4a).

Clustering the different motifs in techno-stylistic groups with a preliminary technological description.

Production of a negative of the original fragment,⁴ (Fig. 4b) and with this, propose the utensil used among different materials: bone, soft and hard wood, stones and fingernails. These are generally materials that have been retouched or worked fragments with a circular or rectangular shape.⁵

Production of experimental pieces. Although at first the use of SiO₂ clay was thought not to be appropriate for the reproduction of the motifs, this material was used in the end owing to the difficulty in reproducing Near East

4. A process that involve making a mould with the motif using kaolinite clay. These moulds of the pieces make the motif stand out and enable technological aspects to be documented that were not identifiable macroscopically in the original piece.

5. A basic premise is that similarities can be found between the archaeological evidence and the experimental pieces produced with tools made from abiotic materials (flint and obsidian lithics) and biotic objects (bone, wood, a fingernail). These are the best materials to create clear, precise and easily visible traces, although some of them might require a series of skills, practice and know-how to be able to use them optimally.

clays in the laboratory and because of their well-purified clay matrix (Fig. 4c).

In the process of reproducing the motifs, 11 individuals took part, all of whom had no experience in ceramics or in the reproduction of decorative motifs (Fig. 4d).

Digitalisation of the experimental process, analysis of the data obtained and production of tables and summaries were developed. A comparison at a macroscopic level and with a binocular microscope of the experimental sherds and the original archaeological fragments was also done.

PROCEDURE AND RESULTS OF THE EXPERIMENTAL PROTOCOL

Although the decorative ensemble is visually quite homogeneous, with clear parallels with other decorative ensembles of the same chronology in the Euphrates valley, the technological-decorative analysis and experimental study has identified some significant variations in several aspects of the *chaîne opératoire*.

First, the decorative groups appear in different percentages and all correspond to different individuals, although the decorative motif is repeated. The most frequent is comb-impression with discontinuous pressure (39%), followed by impressed triangles (22%), also with discontinuous pressure. The following group is formed by lines and groups of lines (14%) made by continuous pressure and in two cases by discontinuous pressure, the use of mixed techniques (mainly painting and incision) with a percentage of 11%, and finally a more varied group (7%) that includes the excised fragment and complex impressions.

The main part of the research has attempted to define the utensil used in the experimentation and to make the experimental sherds. The 11 individuals who participated made the pieces in clay, paying special attention to the reproduction of the original fragment (its position) and of the action used with a tool that had been prepared previously.

All the individuals made an experimental piece with all the utensils for each archaeological object, without any contact with the other participants, noting the position used and making some brief notes in a log book. This process resulted in the creation of over 1,232 sherds. The motifs were later discussed among the participants to reach an agreement about which were the most sim-

ilar at a macroscopic level, without those observations conditioning the rest of the analysis.

At the same time, the technical actions have been characterised. They were reduced to two main categories according to the type of pressure:

Continuous pressure: the utensil is moved continuously over the experimental clay piece.

Discontinuous pressure: the utensil makes occasional contact with differing pressure on the experimental clay piece.

Additionally, different variables were established according to the position of the utensil in relation to the clay sample. These were:

Perpendicular: the utensil is held perpendicular to the experimental sample, i.e. at an angle of about 90°.

Proximal oblique: the utensil is held at an angle of about 45° to the experimental piece, and the end of the tool is in a ventral-proximal position.

Distal oblique: the utensil is held at an angle of about 45° to the experimental sample, and the end of the tool is in a dorsal-distal position.

Left-right: the utensil moves (continuously or discontinuously) from left to right across the experimental sample.

Right-left: a right to left movement across the sample.

Rocking: with a fixed point of contact, a rocking, rotational movement is made with unequal pressure.

Horizontal: the utensil is held parallel to the sample and the contact involves a horizontal movement.

The tools and objects for making and applying the motifs are very diverse and hard to identify in an archaeological context (Fig. 5a). The moulds of the motifs make clear the great variability that existed in the hardness and shape of the objects used to create the same motif. With these limitations, for the first part of the experiment, a wide range of materials were used: bone⁶ (metapods of *Ovis aries* and *Sus scrofa*, and bovine and galliform ribs) (Fig. 5.1), wood (soft wood like cane, etc., and hard wood, from deciduous trees and shrubs) (Fig. 5.b) and lithics (flints and obsidian from the assemblage collected on the surface at Tell Halula) (Fig. 5c). Fingernails were also used as a possible utensil to make the ungulate motifs (Fig. 5d).⁷

A series of general observations were made, once all the information had been obtained, based on the main

6. We are grateful to Buchra Taha for access to her experimental collection in bone, produced in the framework of a doctoral thesis, to be able to carry out the part of the experimental protocol using this kind of object.

7. The use of such other objects as shells, pottery and cords was considered but after initial experimentation with the reference collection and observing the results in the clay, they were discarded as raw materials for the main utensils.

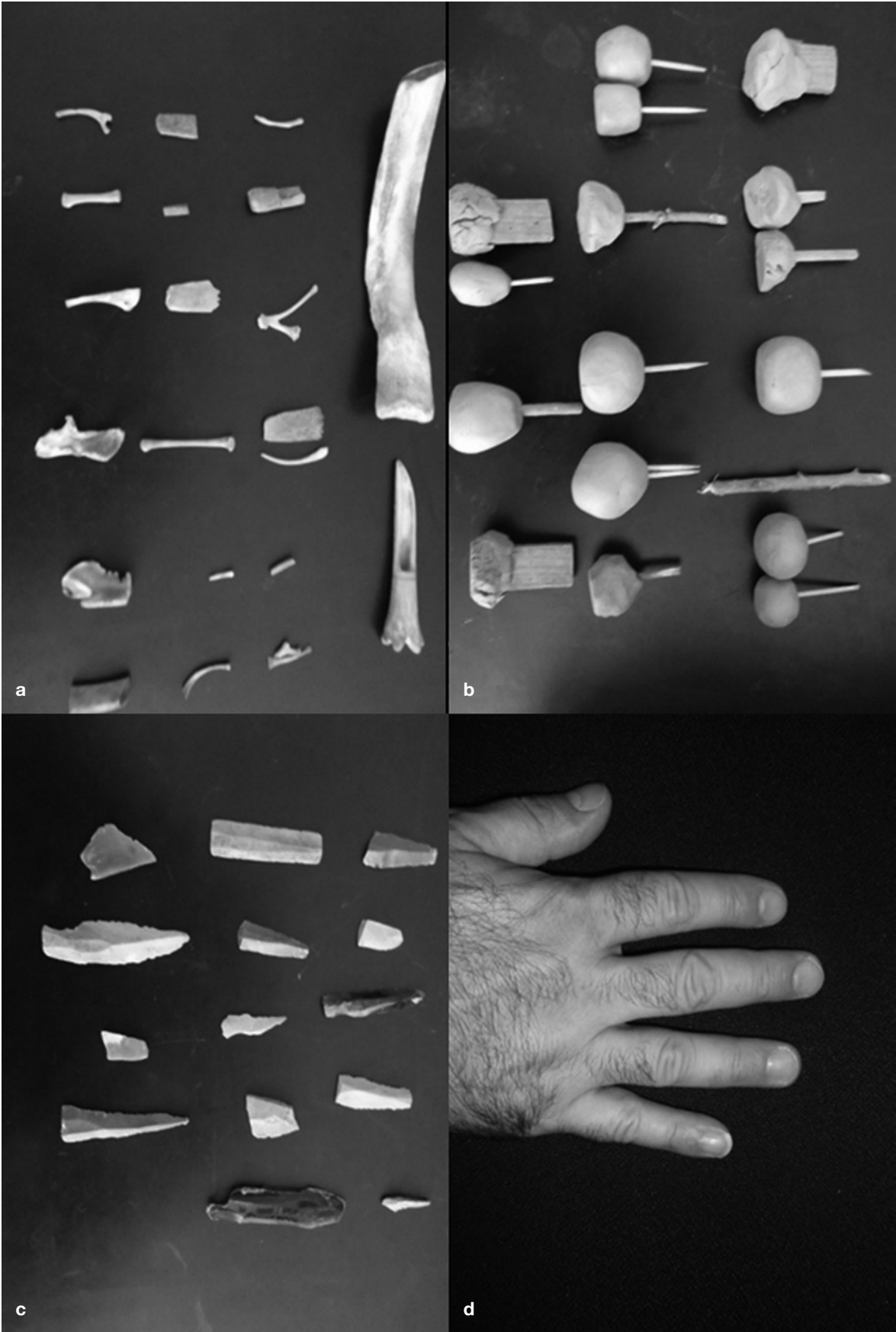


Figure 5. Main tools designed: wood (a), bones (b), lithic (c) and human digitations (d).

motifs. First, through the experimental process it can be affirmed that comb-impression was probably carried out using wood. Bone was also experimented with, but this material was then discarded owing to the impossibility of making rounded teeth and small gaps between the teeth, especially as seen in Fig. 3. A2, A7, A9, A23 and A28. Motifs in the form of triangles were made with wood, bone and lithics. The use of lithics is particularly evident for the large triangles (Fig. 3. A6, A8, A21) and in a more complex way for the small triangles (Fig. 3. A22). Wood is the best material only in the case of the fragment in Fig. 3. A27 and part of Fig. 3. A1. Lines were drawn with wood, bone and lithics. The three materials gave positive results. Additionally, the gap between lines suggested experimentation with long combs with large gaps, and the results were not unacceptable.

For mixed types of decoration (incision, impression and painting), although the use of different implements cannot be ruled out, it seems that the mixed incised types may have been carried out with lithic and bone utensils. In the case of ungulate decoration (Fig. 3. A4. A12), it has been shown that a human fingernail or a bone utensil (made from the epiphysis of an ovicaprid) do not produce significant differences and therefore both methods may have been used.

The suggested experimental protocol is extrapolatable to other assemblages and an exhaustive analysis of the results will be able to infer aspects of technological regionalisation and innovation, and also intermittences in the acquisition of technical know-how.

FINAL REMARKS

The study of the productions known as impressed-incised pottery, comb-impressed and comb-incised pottery has focused on their decorative motifs, which are defined according to stylistic variations, taking into consideration the decorative technique, the structure of the design and the motif itself.

Bearing in mind the significant regional variations in the technology of seventh millennium ceramics with mineral temper and the rapid adoption of these inclusions at sites in Upper Mesopotamia, it appears that this technology was taken up more or less simultaneously over a wide geographic area.

The experimental research has aimed to concentrate on descriptive technological aspects associated not only with the reconstruction of the technological process but also the role of decorative motifs themselves.

Decoration has undoubtedly helped to “mark” the most visible and distinctive element of individuality within a community and between communities. These contain-

ers seem to express in a material and collective way practices that involve the consumption of food and drink and the motifs were probably associated with particular people, occasions and memories, allowing the Neolithic communities to establish networks beyond the immediate surroundings.

It is curious that early Neolithic pottery is characterised by decoration with impressed, incised and painted motifs as these elements are traditionally associated with a phenomenon of certain exclusiveness and linked to a factor of “prestige”. This prestigious production may be connected with technological innovation which, in the course of time, was partially consolidated with the tradition of painted pottery (Akkermans et al. 2006). Ceramic assemblages are characterised within this context, but practically without any technological approach being carried out.

The first trial of our experimental methodology indicates the feasibility and interest of developing it further to define technological characteristics inherent in Pre-Halaf productions. As has been stated, this type of research is practically non-existent in the region and it opens a new perspective of study to understand the human groups better and the communities of practices who produced and consumed the ceramic products.

Although the present study has not concluded, it has shown that experimentation is able to contribute interesting hypotheses not only as regards decorative actions and techniques, but also the utensils and transformed materials. For example, combed decoration appears with great morphological variability, within and among the same refitted fragments. Similarly, the identification of the lithic tools for the reproduction of the triangular motif allows decorative sub-groups to be determined and, through comparison with other sites, at a large-scale this will enable aspects of technological regionalisation to be inferred.

We are aware that this study is only a first approach to a complex topic with a long tradition in archaeological studies. Both the methodology of this approach to Near East assemblages and the hypotheses generated are regarded as very positive and should be developed further in future research.

ACKNOWLEDGEMENTS

This work was developed the framework of different research teams funded by the Autonomous University of Barcelona and the Agaur/Dursi-Generalitat de Catalunya called: SAPPO (*Seminari d'Arqueologia del Pròxim Orient* (2005 SGR 00241; 2009 SGR 00607) directed by Miquel Molist (SAPPO, Departament de Prehistòria, Universitat Autònoma de Barcelona). Moreover,

this research is part of the main project "Origen de las sociedades agrarias en el Próximo Oriente: Consolidación de las comunidades neolíticas en el norte de Siria y sudeste de Anatolia", Ministerio de Ciencia y Innovación Ref. HAR 2010-18612. This article was revised by Peter Smith. Experimental project has been developed in co-operation with Pep Novellón, Laia López, Ariadna Reverter, Alex Carrasco, Silvia Calvo, Adrià Breu, Adrià Ruiz, Teresa Capella, Pau Alberch and Sara Martin.

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