

# BORROWINGS AND EXOGENOUS CONTACT IN THE EASTERN MAGHREB IN THE HOLOCENE: AN EXAMINATION OF THE BONE INDUSTRY

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## ABSTRACT

This article considers the bone industries of the Capsian and the Neolithic of Capsian Tradition. It places these industries in the broader context of the Near-East and Europe in order to identify their unique characteristics and the elements they share with other industries. The criteria considered are at once stylistic, morphological, and technical. Both the Capsian and the Neolithic of Capsian Tradition (NCT), present commonalities with the industries of the Natufian and the PPNB. Is this the result of exogenous borrowings, internal dynamics, or documentation biases? The question of possible contact between cultures and populations is examined here.

**KEYWORDS:** Eastern Maghreb, Near-East, Europe, borrowings, contact, bone technology, typology.

## EMPRUNTS ET CONTACTS EXOGENES AU MAGHREB ORIENTAL À L'Holocène: EXAMEN DE L'INDUSTRIE OSSEUSE

## RÉSUMÉ

Les industries osseuses capsiennes et néolithiques de tradition capsienne sont considérées ici. Elles ont été replacées dans le contexte large du Proche-orient et de l'Europe, afin de cerner leurs singularités et les éléments qu'elles partagent avec ces autres industries. Les critères considérés sont aussi bien stylistiques et morphologiques que techniques. Tant le Capsien que le Néolithique de tradition capsienne (NTC), présente des points communs avec les industries natoufiennes et PPNB. Apport exogène, dynamique interne ou effet de la documentation ? La question des possibles contacts entre cultures et populations est examinée ici.

**MOTS CLÉS:** Maghreb oriental, Proche-Orient, Europe, emprunts, contacts, technologie osseuse, typologie, Eastern Maghreb, Near-East, Europe, Borrowings, contacts, bone technology, typology.



## 1. RESEARCH CONTEXT

The Holocene productions in the Maghreb have long appeared as unique, because they are so different from contemporaneous productions in the European context or the Middle Eastern context of the start of agriculture. Furthermore, echoing previous work, recent studies still highlight the significant contribution of Epipaleolithic groups in the formation of the Neolithic from Egypt to Morocco, through diverse regional acculturation processes. These processes have influenced the originality and plurality of economic and cultural forms in African Holocene contexts (Garcea, 2006 & 2008, Mulazzani *et al.*, 2016). How did these processes develop? And where did they originate? The lack of documentation does not always make it possible to answer these questions, or in any case, to establish a global scenario. The information at our disposal, however partial it may be, shows just how complex the situation is and to what extent the answers vary, for example between Libya (Barich, 1987, Cremaschi & di Lernia, 1998, di Lernia, 1999), Sudan (Garcea, 2006), Tunisia (Mulazzani *dir.*, 2013) and even southeastern Algeria (Messili *et al.*, 2013). Advances in domestication and pottery did not take place at the same rate across the region and were subject to different economic and cultural integration and adaptation processes (Barich, 1974, 1987 & 2010, Cremaschi and di Lernia, 1998). This calls into question the very concept of a “Neolithic package” or a “Neolithic revolution” in this region (Garcea, 2004).

In this context, the question of the incorporation of exogenous elements indicating relations with other populations is still relevant. As such, bone objects, which have never been considered in this light before, deserve to be evaluated in terms of what they can contribute to current knowledge. Other assemblages have indeed demonstrated the presence of exogenous elements within the usual corpus, such as obsidian from the island of Pantelleria detected in the late Capsian in Herghla in Tunisia, which points to the existence of maritime relations with the Italian islands (Mulazzani *et al.*, 2010). Similarly, the manufacture of trapezes in the Upper Capsian, appears to be linked to a large grouping incorporating the northern and southern shores of the Mediterranean (Perrin *et al.*, 2020). Finally, according to current research, pressure knapping, which appeared in the Upper Capsian in Algeria and Tunisia, seems to have originated from a distant location near Greece or even Anatolia (Delaplace, in progress). Further afield, in southern Egypt, DNA analyses have shown that domestic cattle descended from domesticated oxen in the mid-Euphrates valley, allowing Brass (2018) to hypothesize about the existence of small scale exchanges by sea or by land. Signs of contact are thus illustrated by diverse, small-examples between North Africa in its broadest sense and Europe or the Middle East. In order to contribute to our understanding of large scale social



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interactions between groups, this article will evaluate the unique characteristics in a field we know well, since we have been working in it for several decades. It thus attempts to characterize the bone industries by comparing productions from the Eastern Maghreb, Tunisia, and Algeria, with those of the large surrounding cultural groups.

## 2. BRIEF HISTORY OF THE RESEARCH AND DATA

The publications on the bone industry in the Maghreb in the Holocene, while not extensive, include various, fundamental studies, mostly regarding the Capsian, the Neolithic of Capsian Tradition (NCT) and the Eastern Maghreb. We cannot fail to include Camps-Fabrer's typological nomenclatures (1966) in this, which, although of a dated scientific orientation, remain highly valuable in that they offer an exhaustive and meticulous inventory of a multitude of pieces (several thousand in total), which have all been drawn and documented at the prehistoric sites in Algeria that were known of at the time.

In addition to these large-scale studies are other more ad hoc studies, based on the industries at specific sites, which helpfully complement the available data. We can cite the work of Morel (1976), Roubet (1979) & Merzoug et alii (2017) in Algeria. Added to this is an overview of the Algerian Capsian and Neolithic bone industries by Petruccio (2014 & 2016), in which a systematic technological and functional approach aims to establish the evolutionary dynamics of assemblages from the 9<sup>th</sup> to the 6<sup>th</sup> millennia cal BP. For Morocco, we can cite the work of Kaoun (2002, 2008), Lehnig and Linstädter (2020). For Tunisia, some monographical studies have been published by Zoughlami (2009), Mulazzani and Sidéra (2012 & 2013), and Petruccio and Legrand (2013), while Mulazzani (2016) offers technological and functional analyses in addition to typology. I will also include here the unpublished re-examination that I carried out with Mulazzani of the bone assemblages at the Neolithic sites of Doukanet el Khoutifa (Sidéra and Mulazzani 2015, unpublished) and Kef el-Agab in Tunisia (Mulazzani, no date). Some of these studies address technical and functional aspects and clearly offer a technological perspective.

The corpus of bone industries from the Eastern Maghreb is very significant because it includes several thousand pieces, many of which have never been published. However, the documentation is highly dispersed and sometimes little contextualized. This creates a bias in the archaeological use of the material, which necessarily has to be approached at a documentary level.

## 3. STUDY METHOD FOR THE BONE ASSEMBLAGES

The characterization of the industry that we propose here is based on a multi-criteria methodology that has been applied to European assemblages, combining the analysis of techniques and traces with raw materials, functions and morphology (Sidéra, 1993, 2004; Legrand & Sidéra, 2007). This is broken down into the



“macro-morphology” regarding the profile of the objects and the “micro-morphology”, regarding any discrete retouches which do not affect the general form, but which reflect certain habits or technical know-how (Sidéra, 2012). This methodology has proven beneficial when applied to North African assemblages (Mulazzani *et al.*, 2012 & 2013; Petrullo, 2014 & 2016, Lehnig and Linstädter, 2020).

This allows a typological classification to be built from a set of hierarchical criteria based on the study of raw materials, techniques and morphologies. We can thus attempt to grasp the intentions behind these objects and better understand the forms sought, making it possible to objectify any comparisons. For example, special emphasis is placed on the matrices and the way they are cut (debitage), because these are among the most obvious chrono-cultural variants, regardless of the context, since they are the result of technical practices steeped in deep-rooted traditions. This requires a detailed analysis that takes into account not only the recurrent cutting methods for the chosen matrices (processes), but also the techniques, scope and combinations used (methods) (Sidéra, 2004; Legrand and Sidéra, 2007).

Shaping techniques also arise from deep-rooted traditional practices and are, in the context of North Africa, important parameters. The use of scraping (use wear on the cutting edge of stone) and abrasion (use wear on a grainy surface) can be chrono-cultural indicators (Campana, 1989; Mulazzani & Sidéra, 2012; Petrullo, 2014 & 2016a) and also, from the perspective of this article, potential signs of the incorporation of exogenous technical practices. Indeed, scraping was the most predominant technique in the Capsian. The question is to establish whether or not abrasion was a procedure introduced from elsewhere, and if so where did it come from and when? The same goes for techniques for staining the material, which are currently thought to have been associated with heat treatment (Stordeur, 1988b; Sidéra, 2000; Mulazzani & Sidéra, 2012; Mulazzani, 2016). Were these techniques, which have been well documented in the Middle East from the Natufian (Stordeur, 1988; Le Dosseur, 2010) and which were widespread in Europe (Sidéra, 2012), borrowings and if so, where did they come from?

Before tackling the matter itself, let us recall that the work of Camps-Fabrer and that which followed it has shown the persistence of certain Capsian features in later assemblages. The evolving dynamics of the bone industry are no less marked than those of the other technical remains. However, this does not exclude the appearance of new techniques and new forms of objects, as demonstrated by Petrullo in particular (2014 & 2016). Let us add that a strong internal dynamic in the Capsian seems to be emerging from the bone industries, as the very rare assemblage from the late Capsian level seems to show at Hergla (Mulazzani *et al.*, 2012).

Over the following paragraphs, we will develop comparisons with the surrounding industries in order to better document the specific features of the industries of the Eastern Maghreb in their broader context.





Figure 1 Examples of straight diaphysis points in different formats (original photograph in Petruzzo, 2016a) (© S. Oboukhoff, MSH Nanterre, CNRS).

#### 4. THE UNIQUE MORPHOLOGICAL AND TECHNICAL CHARACTERISTICS OF THE MAGHREB INDUSTRIES

We will begin here by evoking the unique characteristics of the assemblages from the Capsian and the Neolithic of Capsian Tradition. To do this, we will examine the most original elements, specific to these industries.

##### STRAIGHT DIAPHYSIS POINTS

The first techno-typological elements that deserve attention, because they appear typical, or even emblematic of the Upper Capsian are “straight diaphysis points”. These points are extremely common in the Capsian industries and are made from segments of long bone diaphyses, particularly the metapodials of hartebeest and gazelle. They were shaped very intensively, sometimes until all signs of debitage have disappeared, ending in the form of a point with a flat or rounded tip (Figure 1). An ingenious cutting method was used, based on extracting five or six longitudinal parts of variable width (between 10 and 16 mm) from a ruminant metapodial in order to manufacture points of different calibers (Petruzzo, 2016a) (Figure 2). This consistently planned “multiple structured cutting method” as Petruzzo termed it (2014), is unique to the Upper Capsian, and two completely identical sets of debitage have been identified at the sites of Dra-Mta-El-Abiod (Petruzzo, 2014) and Ain Misteheyia (Mulazzani, 2016).



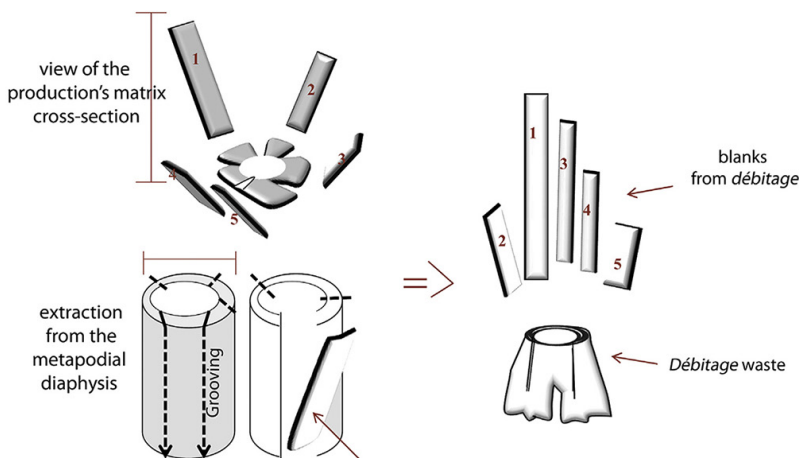


Figure 2. Principle of “multiple structured cutting” dividing ruminant metapodials to obtain five or six sections in different formats from the same matrix to make straight diaphysis points (original drawing in Petruccio, 2016a).

#### POINTED TOOLS ON RUMINANT DEMI-METAPODIALS WITH PROXIMAL EPIPHYSES

Camps-Fabrer’s work shows that in the Upper Capsian an overwhelming majority of pointed objects present straight profiles, regardless of the matrix they came from or their function. This is another unique characteristic. Thus, the proximal epiphysis, which is naturally flat in shape, has most often been chosen for pointed tools on ruminant metapodials (Figure 3). They always or almost always end with an extension of the main shaft of the object, although the cutting methods used for their manufacture are diverse (Mulazzani & Sidéra, 2012 & 2013; Petruccio, 2014 & 2016). A clear preference for the proximal epiphysis can be observed here. Comparative studies have shown that the choice of the epiphysis for the end of the objects was a matter of style and a cultural variable (Sénépart & Sidéra, 1991). Some cultures preferred objects ending with the distal epiphysis, while others clearly preferred the proximal epiphysis. It could also be determined by the cutting methods applied to the matrices. Thus, the question of whether the objects ended with or without the epiphysis and whether this was the proximal or distal epiphysis were structuring aesthetic principles independent of the function of the objects and a choice that varied according to the culture and time period (Sidéra, 2012). Petruccio and Legrand have carried out, both separately and together, detailed studies of the use wear at several Capsian sites: Dra-Mta-El-Abiod, Ain Mouhaad, Kef Zoura D and Aïn Misteheyia in Algeria, and Hergla in Tunisia. These studies have shown that straight and epiphysis points were used indifferently for domestic activities with a certain functional equivalence. Perhaps the straight points were also used as



Figure 3. Example of a pointed tool on a ruminant demi-metapodial including the proximal epiphysis (Hergla) (from Mulazzani & Sidéra, 2012) (© S. Oboukhoff, MSH Nanterre, CNRS).

fastening objects, for example to close clothes or bags, or even as labrets (Petrullo, 2014; Petrullo & Legrand, 2013). This appears to be the only difference between the different types.

#### POINTED TOOLS WITH CURVED ENDS

Along with the structuring aesthetic principles noted above, another element can be added, which still concerns the field of aesthetics because it has no functional purpose, namely the preference for pointed tools with curved ends (figure 4). The curved pieces are emblematic of the Capsian, and persisted into the Neolithic in different forms (Petrullo, 2016a). The desired curve was obtained either by selecting a naturally curved blank, such as a vestigial metapodial or rib, or by cutting and shaping (Petrullo, 2016a).

#### OBLIQUE BEVELED PIECES

A type of piece consisting of oblique beveling on one end and a blunted point on the other end is quite unique to these industries. Because the precise function of this piece is not known, it has been deliberately named, “oblique beveled piece” (Figure 5). While not common, this type of object is systematically found in



Figure 4. Examples of curved points on a ruminant vestigial metapodial (original photograph in Petrullo 2016a) (© S. Oboukhoff, MSH Nanterre, CNRS).



Figure 5. Example of a piece with oblique beveling, the opposite end of which is broken (Hergla) (from Mulazzani & Sidéra, 2012) (© S. Oboukhoff, MSH Nanterre, CNRS).

the Capsian series from the Eastern Maghreb, and three such pieces appear in the small assemblage from Hergla (Mulazzani *et al.*, 2012). The function of these pieces is a mystery, especially as they have not been the subject of any detailed functional analyses. In carrying out the first microscopic observations of the beveling on three objects of this type from the bone assembly at Hergla, all of which were incomplete, we have been able to demonstrate that the form of the beveling was not the result of a specific use, but of intentional shaping by scraping and/or abrasion (Mulazzani & Sidéra, 2012) (Figure 6). It is possible that the beveling did not involve an actively used edge, but a shape that was sought in order to facilitate the gripping or hafting of the tool, which can ultimately be considered part of the pointed tool family. A systematic investigation into the function of this tool and experimental work still need to be carried out in order to establish the precise nature of these objects.







Figure 6. Abrasion striations from shaping the beveling of an oblique bevelled piece: oblique parallel grooves (Hergla) (from Mulazzani & Sidéra, 2012) (© I. Sidéra).



Figure 7. Example of a pointed tool on a ruminant distal demi-metapodial (Hergla) (from Mulazzani & Sidéra, 2012) (© S. Oboukhoff, MSH Nanterre, CNRS).

## 5. CONVERGENCES BETWEEN THE INDUSTRIES AND TECHNICAL PRACTICES AT A LARGE SCALE

The unique features we have just mentioned here, to which others can probably be added, are strictly original cultural markers. Let us now examine the common features that the bone industries of the Capsian and the Neolithic of Capsian Tradition share with other European (Balkans and the Mediterranean) and Middle Eastern universes (Jordan, Israel, Syria, Anatolia, Iran and Iraq).

### POINTED TOOLS ON THE DISTAL DEMI-METAPODIALS OF SMALL RUMINANTS

Let us first mention the most common piece in the Middle Eastern and European Neolithic: a pointed tool made on the distal demi-metapodials of small ruminants such as sheep, goats, roe deer, and gazelle (Figure 7). The cutting method used is very simple, involving a bifacial cutting plane dividing the diaphysis and epiphyses of the metapodials in two. In the Capsian tradition, this cutting method is also one of the most widely used (Mulazzani & Sidéra, 2012; Petrullo, 2016a) and maintains the proximal epiphysis on the object, which was sought for tools whose profile had no break between the shaft and the end of the tool (see above § Pointed tools on ruminant metapodials with proximal epiphysis: Figure 3). Regardless of the choice of epiphysis, the most important variable regarding this common form

of object concerns the cutting method used; i.e., the number of techniques employed and the way in which they are spatialized (the scope of the techniques). In the upper Capsian, it appears that the method that was overwhelmingly favored was “complete sawing”, carried out from one epiphysis to the other through the entire thickness of the cortical bone. This was sometimes combined with percussion to complete the cut (Petrullo, 2016a). In comparison, in the Natufian, the ancient European Neolithic, and the PPNB, the techniques and methods applied in cutting these objects combine sawing, percussion and abrasion with a wide variability in the scope and techniques used, according to each site, region, and chronological period (Sidéra, 2012).

With similar domestic functions to those of the other points, the pointed tools on demi-metapodials with distal epiphyses are present in some series, but are erratic in the Capsian context, such as at Hergla (Mulazzani *et al.*, 2012) and Dra-Mta-El-Abiod (Morel, 1976). They appear to be slightly more common in the Neolithic, such as in the assemblages at Capéletti (Roubet, 1979; Petrullo, 2014) or the Kef el-Agab escargotièrre (Mulazzani, no date). The tool with an “integrated handle”, as Stordeur termed it (1978), to highlight the functional role of the end of the tool, is of a very different, if not contradictory, design to that which prevailed in the Capsian. A real contrast can be seen in the profile of the tool, which ends with a globular tip (Figure 7). Petrullo sees this as an evolutionary factor between the Capsian and the Neolithic (2016).

Working on possible borrowings from the northern Levant in the bone industry of the southern Levant, from the Natufian to the PPNB, Le Dosseur (2010) has shown the gradations in the transformation of technical practices over the long term. In the Natufian, like in the Capsian, pointed objects were mainly produced on segments of metapodials which include the proximal epiphysis. Gradually, and by stages, the distal epiphyses were more often included on the tools, until they were preferred in the PPNB. Let us add that these transformations took place based on borrowings that were foreign to the local context. In the eastern Maghreb, such a process is difficult to demonstrate, because the even greater rarity of bone material after the Neolithic period does not make it possible to draw conclusions. However the idea that the more systematic introduction of tools with integrated handles in the Neolithic period was due to renewed contact or exchange with other cultural spheres, which then lead to changes in the technical traditions, is not unreasonable. We must therefore bear this hypothesis in mind to verify at a later stage. In any case, different dynamics may also have been at work depending on the sites, since these tools are not present everywhere. There are none at Doukanet el Khoutifa, for example, where none of the pointed tools include the epiphysis (Zoughlami, 2009 and personal study).



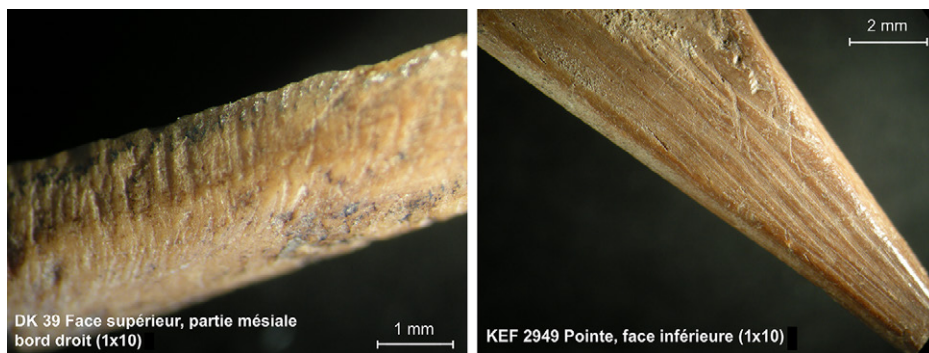


Figure 8 Left: wide and deep abrasion marks from modeling the mesial part of a pointed tool at Doukanet el Khoutifa (© I. Sidéra). Right: longitudinal scraping marks on the tip of a pointed tool from Kef el-Agab tool (© I. Sidéra).

#### THE USE OF ABRASION AND SHAPING SEQUENCES

Like the pointed tools with an integrated handle, the use of abrasion pre-existed in the Capsian context, however it was little used and only in specific contexts. In the Algerian assemblages, Petruccio has detected signs of abrasion applied to the points, and work carried out to even out the roughness and the edges, following scraping (2016a). Abrasion completed the shaping cycle. In the Neolithic period, according to Petruccio, abrasion was used in a very different way, primarily to model the pieces. A change in technical practices regarding the shaping of objects could therefore have been at work between the Capsian and the Neolithic. Furthermore, the grain size of the abrasive materials was also very different between the two periods. In the Capsian, the extremely fine abrasion striations can only be seen under a microscope and come from very fine-grained stones. This corresponds well with what can be observed in the Capsian series from Hergla in Tunisia, where the abrasion striations are extremely fine and superficial. They are often ambiguous and are prone to be confused with oblique or transverse scraping marks. In contrast, in the Neolithic series from Kef el-Agab and Doukanet el Khoutifa, the abrasion marks clearly correspond, in terms of both depth and width, to abrasion from modeling or shaping (Figure 8). This new change in technical habits between the Capsian and the Neolithic, involving the unprecedented use of abrasion, could also be a sign of exogenous contact with groups among which the practice of abrasion was common.





Figure 9. Example of a piece on a flake shaped by percussion (Hergla) (from Mulazzani & Sidéra, 2012) (© S. Oboukhoff, MSH Nanterre, CNRS).



Figure 10. Detail of removals (Hergla) (from Mulazzani & Sidéra, 2012) (© I. Sidéra).

## THE USE OF PERCUSSION

Percussion was primarily used to produce pointed tools and, secondarily, frontal and lateral cutting tools on flakes, as indicated by two pieces from Hergla and others from Capéletti (Mulazzani *et al.*, 2012; Roubet, 1979; Petrullo 2014) (Figure 9). At these sites, percussion was also used for shaping in which the bone was chipped like stone, using direct percussion (figs. 9 & 10). Beyond their apparent banality, awls that were quickly pointed on irregular bone flakes are also characteristic, both in their abundance and in their coexistence with more elaborate awls. According to Stordeur, the difference between the regularity of the contours and the labor time invested in producing these pieces are typical of the Middle Eastern industry (pers. comm.). Beyond this, it is a “technical package” or a set of practices, that was transferred from the Middle East to the continental European Neolithic (Sidéra, 1997).

## STAINING OF THE BONE MATERIAL

We can add to this list of techniques certain convergences which could be the result of borrowings, regarding the staining of the bone material. This included an undetermined technique involving a form of heating that did not degrade the material (Stordeur, 1984; Sidéra, 2000) (see an example in Figure 11). It gave the bone matter a bright shine and allowed it to be stained in all the chromatic varia-

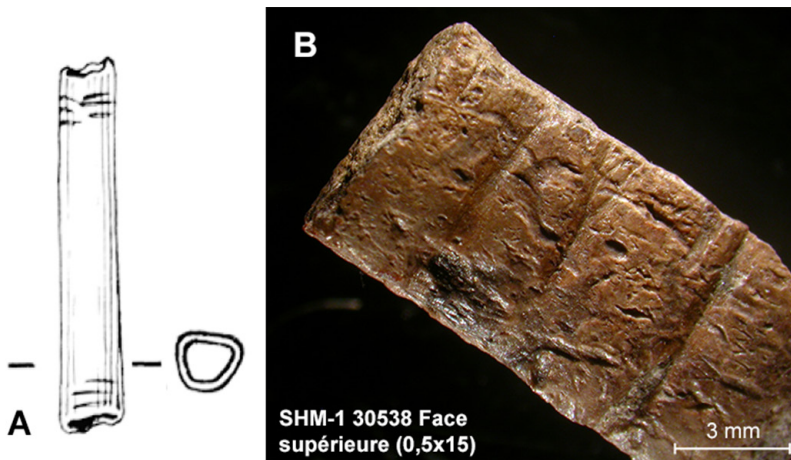


Figure 11. A: Scale drawing of a tube made on bone (Medgez II) (original drawing in Camps-Fabrer 1975). B: possible tube or ring decorated with parallel incised lines (Hergla) (from Mulazzani & Sidéra, 2012) (© I. Sidéra).

tions from brown to black, either in a uniform or mottled manner. This technique seems to have been used during the Capsian and has been observed at two sites: Hergla and Aïn Misteheyia (Mulazzani *et al.*, 2012; Mulazzani, 2016). It is very common in the Middle East (Stordeur, 1984) and has been identified in the assemblages from the Balkans (Bulgaria and Macedonia: Sidéra, 1998, 2000 & 2012) as well as in the Cardial culture of southern France (Sénépart, 1991).

## TUBES

Tubes made from bird and leporid long bones have been documented in the Capsian and the Neolithic. They involve simple sections, sawn at both ends, and sometimes decorated with incised parallel lines (Camps-Fabrer, 1975) (Figure 11). In Hergla, a fragment of an object decorated in this way could come from a tube or even a ring (Mulazzani *et al.*, 2012) (Figure 11). Although not commonplace, tubes have been documented at sites from the Upper Capsian, such as Medgez II (Algeria), where several dozen have been found (Camps-Fabrer, 1975). Pieces of this kind without decoration are common in the Middle East, from the Natufian to the Iron Age (Stordeur, 1994). They have also been documented in the ancient Neolithic in the Balkans, where they were probably imported from the Middle East (Sidéra, 1997).



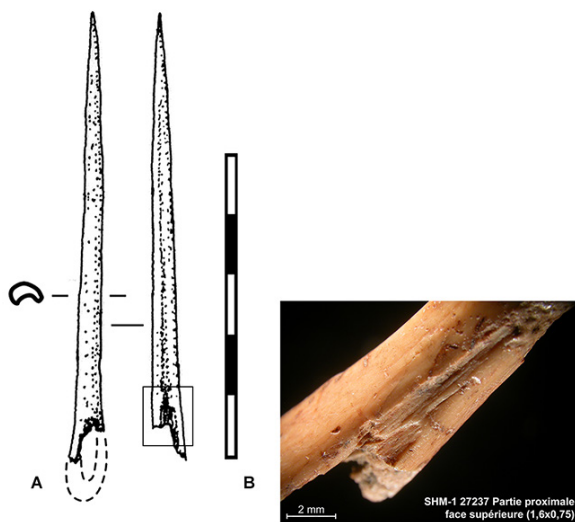


Figure 12. A: Incised eye needle. B: Detailed view of the erratic cutmarks from the sawing of the eye (Hergla) (from Mulazzani & Sidéra, 2012) (© I. Sidéra).

## INCISED EYE NEEDLES

A needle with an incised eye documented in the industry from Hergla (Mulazzani *et al.*, 2012) (Figure 12) is exceptional, because while needles were certainly part of the Capsian corpus (Camps-Fabrer, 1966), this technique for piercing the eye is unheard of in the context of the Eastern Maghreb and is evocative of later pieces, typical of northern Syria and Anatolia in the PPNB (Stordeur, 1988a).

## SPOONS

Spoons are rare objects and are only found in the Neolithic according to Camps-Fabrer (1975). A complete spoon, with an oval-shaped hollow and a shortened handle, has been documented in the series from Doukanet el Khoutifa<sup>1</sup> (Zoughlami, 2008) (Figure 13a). A fragment of a broken bone object, which has been fractured at an angle, with a flared base with a marked protrusion on a straight shaft with an oval cross-section, is highly reminiscent of such spoon fractures

<sup>1</sup> The image of the spoon from Doukanet el Khoutifa (Figure 13) was obtained by a scanner and is not of high quality. We wanted to include it here, as it is the only image available of this piece.





Figure 13. Example of spoons. A: spoon (Doukanet el Khoutifa) (© S. Mulazzani & I. Sidéra). B: possible fragment of a spoon (Hergla) (© I. Sidéra).

(Mulazzani *et al.*, 2012) (Figure 13b). It should be noted that this possible spoon is located in the most recent levels of the site's stratigraphy (Levels 5-7, dating to the end of the 6<sup>th</sup> millennium). Spoons exist in the Middle-Eastern repertoire in the Natufian and reach an apogee in the PPNB in Anatolia, where they are common objects and have been made with great skill and imagination: these spoons come in all shapes and sizes and the handles have been sculpted (Mellaart, 1970). These productions were also widespread in the Balkan Neolithic and their origin can be sought in Anatolia (Sidéra, 1997 & 2012).

## 6. DISCUSSION

The idea of this article was to place the bone industries of the Eastern Maghreb from the sequence of the Upper Capsian to the Neolithic of Capsian Tradition –which are by far the best documented in North Africa– in a broader geochronological context. The objective was to perceive the unique characteristics of these industries and the elements they share and to establish the nature of any contact with the other surrounding cultural spheres in Europe and the Middle East. There is no objective reason to think that the cultures of the Maghreb developed



in complete isolation, with no exogenous input. But what were these exogenous contributions? Where did they come from? And by which route(s) did they arrive? These are the questions posed here.

The analysis of the Capsian bone industry, in particular that of the upper Capsian, unquestionably demonstrates a very strong identity, which we are starting to perceive thanks to increasing studies in this area. We have described its unique characteristics here. It should be noted that many of them are shared with the Natufian, particularly in terms of aesthetics and function. These characteristics include the notable use of stone for cutting, shaping, sawing and scraping, the discreet use of abrasion, the staining treatment of the material, and finally the predominant manufacture of points made from bone diaphyses, which are not throwing weapons, but common household tools (and when the piece includes an epiphysis, it is systematically proximal). To this we can add basic pieces, such as tubes, and one of the simplest technical processes: cutting in half. These are a set of characteristics that could be attributed in all respects to the Natufian industries (12,000-10,300 cal BP), as described by Stordeur, Campana and Le Dosseur (1984, 1989 & 2010). Are these simple convergences related to the universal practices of predatory nomadic cultures? Or the gradual acquisition of exogenous techniques, passed from one neighboring group to the next? It is difficult to draw any conclusions at the current time, due to a lack of solid documentation regarding the geochronological link between these different universes, including the Epipaleolithic on the northern shores of the Mediterranean, of which we know too little (Sénépart, 1983).

The question of technical transfers is very complex and the answers are often delayed in time and deviated in space, following unexpected paths. Exact replicas, omissions, and derivatives resulting from the adaptation of borrowings to a pre-existing local context further cloud the issues. Such is the case with the example given by Le Dosseur (2010) concerning imports from the north to the south of the Levant; or the one I myself noted, in which the industry of the ancient Balkan Neolithic (6,200 cal BC) appears to have inexplicable roots in the PPNB (8,600-8,000 cal BP) in the Konya plains in Turkey, with a time lag of nearly 1,000 years (Sidéra, 1998 & 2012); or again with the heritage of Balkan traditions in the ancient Neolithic of northern France, which in reality arrived not through the continental route, but through the Mediterranean Neolithic and new population mechanisms (Sidéra, 2010; Sidéra *et al.*, 2010). The convergences between the European Neolithic, the Middle Eastern Neolithic and the Neolithic of Capsian Tradition, on different bases to those of the Capsian, are also perplexing. Other key features of the PPNB industries include the more systematic use of percussion and abrasion, with a change in the function, form and tools in comparison with the Capsian and the more frequent inclusion of the distal part of the metapodials for manufacturing “tools with an integrated handle” in a strong conceptual shift from previous productions. Was this a matter of exogenous contributions? Internal dynamics? It is difficult to draw any conclusions at this scale, again because of the significant gaps in documentary evidence. In any case, the changes in industry in the Neolithic of Capsian Tradition show that, if there was an acquisition of exogenous know-how, it came from new sources. All of these elements deserve further work and consideration.





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