

BONE ARTIFACTS FROM CHALCOLITHIC FUNERARY CONTEXTS IN THE EASTERN AND SOUTHEASTERN IBERIA: POINTED FLAT RODS

Artefactos óseos de contextos funerarios calcolíticos en el Este y Sureste de la Península Ibérica: las varillas planas apuntadas

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ABSTRACT One of the most characteristic bone objects in the Late Neolithic and Chalcolithic funerary record of the south-eastern area of the Iberian Peninsula is the so-called “pointed flat rod”. They have been mentioned in many of the papers published since the beginning of the 20th century. However, their identification, description and functional attribution have not ceased to be problematic. This paper has focused in the manufacturing techniques employed in the production of these bone artefacts and evaluates the different hypotheses related to their supposed use as hairpins, awls or cosmetic palettes —among others— taking into account the archaeological contexts recorded in some recent excavations and the analysis of ancient collections stored in museums.

Keywords: Copper Age, Iberian Peninsula, Funerary Record, Bone Production, Bone Flat Rods.

RESUMEN Uno de los objetos óseos más característicos del registro funerario del Neolítico y Calcolítico del Sureste de la península Ibérica son las llamadas “varillas planas de hueso”. Con este nombre es con el que mayoritariamente se las viene conociendo en la bibliografía arqueológica desde inicios del siglo xx. No obstante, su identificación, descripción y atribución funcional nunca han dejado de suponer un problema. Este trabajo se centra en el análisis de las técnicas de trabajo empleadas en su producción y en evaluar las diferentes hipótesis planteadas en cuanto a su posible uso como agujas para el pelo, alfileres o paletines cosméticos, entre otras, a partir de los contextos arqueológicos documentados en excavaciones recientes y en el análisis de antiguas colecciones conservadas en diversos museos.

Palabras clave: Edad del Cobre, Península Ibérica, Registro funerario, Producción ósea, Varillas planas.

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A CONTROVERSIAL OSSEOUS ARTEFACT IN THE FUNERARY ARCHAEOLOGICAL RECORD OF THE LATE NEOLITHIC AND CHALCOLITHIC

Late Neolithic and Copper Age sites in the eastern part of the Iberian Peninsula are similar in many ways to those in the south and southeast. In both areas, most of the settlements are in the lowlands, in the plain of the valleys, near rivers and lagoons, often surrounded by ditches. The houses were made mainly of clay and perishable materials and the stone and bone tools, as well as the ceramic vessels, are very similar in form and function. Also, burials are occasionally recorded inside ditches, large pits or in reused storage silos, excavated in the soil of the inhabited area (Bernabeu and Orozco, 2014; Nocete, 2014).

There are, nevertheless, some notable differences. Among them is the presence in the southeastern area of large fortified settlements with wide lines of walls, located on the confluence of rivers and ravines. Los Millares is the best example (Arribas and Molina, 1984; Molina and Cámara, 2005). These sites played an important political role in their territories on a scale never seen before in the eastern territory of the Iberian Peninsula until at least the Bell Beaker period, at the end of the Copper Age (López, 2006; Bernabeu *et al.*, 2006; García Puchol *et al.*, 2013).

However, the major differences between the East and the rest of the peninsular area can be seen in the funerary record. Between the left bank of the river Segura, to the south, and the left bank of the river Ebro, to the north, a wide area is delimited, extending several hundred kilometres towards the hinterland, where most of the population was buried collectively inside natural caves and there is no evidence of megalithic tombs (López, 2008). Together with the human bone remains, a wide range of ceramic, stone and bone tools and ornaments are found in these caves (Soler, 2002).

The first archaeological explorations of these funerary caves date back to the beginnings of the 20th century. In those years, the Spanish priest José Belda carried out excavations in the cave of La Barcella, in Alicante (Belda, 1929, 1931). There he found a large number of human skeletal remains and many objects, including pottery and metal, bone, stone and shell artefacts and ornaments. Among the osseous objects, mixed with the human bones, a series of flat, pointed pieces stood out for their large number and quality (fig. 1). Many of them showed careful polishing and a flattened end, leading Belda to consider them spatulae (Belda, 1929:22). At the same time, Cuadrado excavated a similar cave in Lébor, Totana, where he found skeletons, stone axes, ornaments, idols and bone points, and flat rods similar to those of La Barsella (Cuadrado, 1930).

A more precise hypothesis about the function of this type of bone tools was adopted after the excavations carried out by J. de C. Serra Ràfols in the Middle Neolithic site at Bóbila Madurell, discovered in 1921 at Sabadell, Catalonia. Many tombs were located there, mostly individual tombs. Inside the pits, next to the skeletons, bone points made from sheep, goat or red deer metapodials were usually found. Sometimes, they appeared packed at the side of the skeletons. In some cases, the bone point was found on the parietal of the skull. Consequently,



Fig. 1.—Set of flat bone rods from the burial cave of La Barcella (Torre de les Maçanes, Alicante).
Photo: Archaeological Museum of Alicante-MARQ.

Serra Rafols thought that they had to be hairpins (Serra-Ràfols, 1947:68). When another Neolithic cave with a collective burial was discovered in Gandía, Valencia, I. Ballester Tormo endorsed that same idea. For him, the flat bone rods of Camí Real were flat hairpins too (Ballester, 1929:70).

Some years earlier, F. de Motos published his excavations at Cerro de las Canteras, in Almería. He found houses, workshops, and a wide set of bone artefacts in this Copper Age settlement, including pointed flat rods, which should

be, therefore, a tool for a domestic use (Motos, 1919:51). In a similar way, when Afonso Do Paço published his excavations at Vilanova do Sao Pedro, he thought that the flat bone rods found in the settlement had to be some kind of tool for make-up (Jalhay and do Paço, 1945:40).

When the Leisners carried out their study of the megalithic burials of the Iberian Peninsula, they had problems proposing a concrete use for these bone objects. In their opinion, they were probably spatulas, although it was not certain because of the fragmentary state of the pieces (Leisner and Leisner, 1943:423). Neither the annotations in the field-diaries of L. Siret nor the study of the pieces in the National Archaeological Museum in Madrid provided any relevant information in this regard. Consequently, they decided to simply describe them as *flache knochenstäbe* (flat bone rod). The translation into Spanish of this term —*varilla plana de hueso*— is the name by which they are still known currently in the Spanish archaeological bibliography (Pascual, 1998; Maicas, 2007; López, 2017).

The exhaustive and complete work of the Leisners was also decisive in other aspects, as in their opinion, these flat bone rods could be found in practically the entire southern half of the Iberian Peninsula during the Chalcolithic: from Valencia, in the East, to Lisbon, in the West (Spindler, 1981:87; Acosta and Cruz-Auñón, 1981:327). This idea was reinforced in the following decades, along with the opinion that these flat rods were used mostly as hairpins (García del Toro, 1986:157; Pascual, 1998:111).

However, at the beginning of the 21st century, researches began to show a more complex picture. Today, some questions must be raised concerning this type of bone artefact. Despite the studies carried out, there is still too much ambiguity in its definition. What kind of artefact are they? Are they really all hairpins? Are they simply pins? Could they be used as spatula, or were they something different? Were they really used in the same manner everywhere? To begin to find answers for some of these questions it was necessary to revise the formal parameters used to define the bone flat rods to improve our knowledge about their manufacturing techniques in different areas of the Iberian Peninsula.

A TECHNICAL AND MORPHOLOGICAL DEFINITION OF POINTED FLAT BONE RODS

In 1986, J. R. Garcia del Toro defined the flat bone pointed rods, using as a reference the set of pieces found in diverse funerary caves of Murcia and Alicante. The author recognised three different parts in each piece: head, body and tip—corresponding to the proximal end, mesial part and distal end, respectively—suggesting different morphological variables for each one of them. This way, he tried to encapsulate all the morphological diversity of this type of objects (García del Toro, 1986:157).

One of the main characteristics is the type of raw material used in making the rods, which is always the metacarpus or metatarsus of goats, sheeps or deers. On the

internal faces of many proximal pieces of the rods there are appreciable traces of this: for example, parts that preserve the spongy tissues or even remains —although almost completely eliminated by abrasion— of the internal medullary canal. On the other hand, the dimensions of the flat rods —when they are complete— allowing the species of bone used as raw material to be determined to some degree. From the analysis of the faunal remains found at different Copper Age sites of the south and southeast of Iberia, it has been possible to estimate the length of the bones of domestic sheep and goats consumed during the 4th and 3rd millennia BC. According to these data, the average length of the metatarsals of adult sheep found at diverse excavated sites such as Valencina de la Concepción (Hain, 1982), Cerro de la Virgen (Driesch, 1972), Los Millares (Peters and Driesch, 1990) or La Vital (Iborra and López, 2011) is 15,1 cm, though some cases can reach to 16 cm, as in Jovades (Martínez Valle, 1993). Consequently, any flat rod of bone that clearly exceeds 16 cm in length would probably have been made from the metacarpus or metatarsus of other larger species, such as *Bos taurus*, or especially *Cervus elaphus* (fig. 2).

The manufacture of the rods began with the splitting of the metapodium (Averbouh and Provenzano, 1999), usually by grooving, which is a widespread

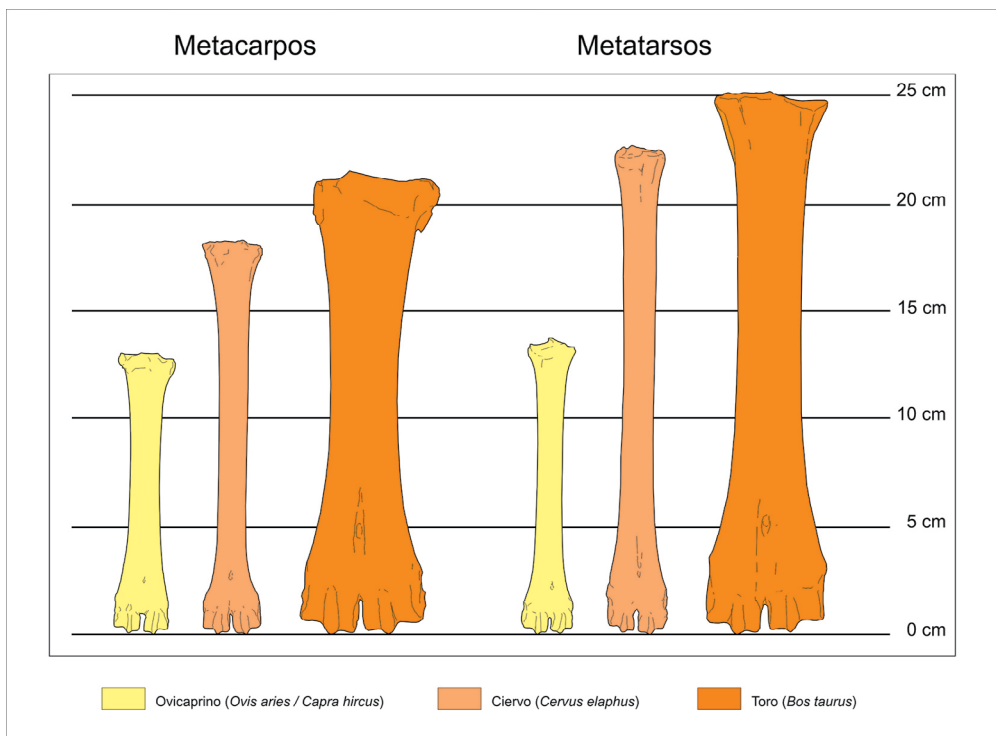


Fig. 2.—Approximate comparative size of metacarpals and metatarsals of adult sheep/goat, deer and bull.

technique in Neolithic times in the whole area. In a recent paper, J. L. Pascual (2016) has compiled the evidence recorded in the Neolithic and Chalcolithic sites of the East and Southeast of the Iberian Peninsula of how metapodia were split to obtain the blanks for making bone points and awls. Most of them are metacarpals and metatarsals with unequivocal traces of deep incisions, percussion or abrasion of the surface of the bone, made to obtain or facilitate their longitudinal cutting. Although subsequent work processes usually erase the traces of these initial cutting operations in flat bone rods, in some finished pieces it is still possible to see them (fig. 3:1).

In a second stage of processing, the final shape of the piece was achieved by abrasion, which usually left clear marks in perpendicular and/or transversal direction. In the best quality rods, the spongiosa tissue of the bone disappeared almost completely, and the same occurs with the traces of the medullary canal of the bone. In this way, the finished pieces acquired their characteristic flat and thin cross-section (fig. 3:2).

A typological classification is possible mainly based on the shape of the proximal end. The less worked pieces preserve the epiphysis almost completely. However, most of them show varying degrees of transformation. The main type of flat bone rod has no epiphysis at the proximal end, which is generally flat. In these cases, finishing the piece included cutting of the epiphysis and abrasion of the edge. A variant of this flat base end is a wider end, which acquired a deliberately broader form in some pieces, described by some researchers as “fan-shaped” (Maicas, 2007:146).

Lastly, a small group of flat rods was decorated at their proximal end. The most common technique is a series of teeth carved into the lateral edges, usually grooving with a sharp tool. The size of this teeth varies, as does the depth of the notches and their direction. In some cases, the decoration acquires a “saw-shape”, as occurs with some flat pointed rods found in Cehegin, in Murcia (fig. 4). This same technique was used to decorate other rods with parallel grooves, although this motif is less frequent in these pieces (Pascual, 1998:113-115). Finally, some rods have completely modified ends, with cut out profiles or a combination of the types described above.

Painted decorations have been preserved only in some exceptional cases, such as one of the flat rods found in Cueva Sagrada, at Lorca, Murcia (Ayala, 1990:77) (fig. 5). We still lack any archaeometrical analysis of the pigment employed to paint this piece, but in the most similar case—a piece of ivory found in the Argaric site of Tabayá, in Alicante—the spectroscopic analysis revealed that it was cinnabar (Schuhmacher, 2016:150).

In my opinion, the essential morphological characteristics of a typical bone flat rod would be:

- a) modification of the longitudinal portion of a metapodium (metatarsus or metacarpus) of ungulate of medium or large size (mainly sheep, goats, bovines or cervids);



Fig. 3.—Above: Traces of sawing in a flat bone rod of Barranco de la Higuera (Fortuna, Murcia). Archaeological Museum of Murcia. Below: Traces of abrasion on the proximal end of a flat bone rod of La Barcella cave (Torre de les Maçanes, Alicante). Archaeological Museum of Alicante. Photos: Juan A. López Padilla.



Fig. 4.—Proximal end of a flat bone rod found in Cueva de Las Canteras (Cehegín, Murcia), showing a “saw-shape” decoration. Archaeological Museum of Murcia. Photo: Juan A. López Padilla.



Fig. 5.—Flat bone rod of Cueva Sagrada (Lorca, Murcia) with painted decoration. Archaeological Museum of Lorca (n. inv. 1992). Photo: Photographic Archive of the Municipal Archaeological Museum of Lorca. Drawing: from M. M. Ayala, 1990:85, fig. 2.b.

- b) a clearly rectilinear profile and a pointed distal end, opposite to a proximal one in which one of the epiphysis (normally distal) of the metapodium may, or may not, be present; in the latter case, the proximal end may end up in a rounded form, or on a straight front —surpassing or, at least, equalling the maximum width of the shaft— or being decorated with notches or side teeth, grooves or, sometimes, perforations;
- c) a cross section of a thickness never greater than 3 mm along the shaft, and no remains —or very lightly marked and only in the proximal part— of the medullary canal of the bone; it must also show lenticular, rectangular or, eventually, flat-convex forms.

DISTRIBUTION OF BONE POINTED FLAT RODS IN THE IBERIAN PENINSULA

Keeping in mind all these characteristics and the different types of rods identified, we can now relate this type of flat rod to other peninsular areas. Although they have been assumed to be a type of bone object widely distributed in almost the whole Iberian Peninsula during the 4th and 3rd millennia BC, it is sometimes difficult to record their presence from the literature. This is because, in many cases, the graphic representation and/or the descriptions of the pieces do not specify essential characteristics for their identification as flat rods. On the other hand, although the production of bone objects during the 4th and 3rd millennium BC was mostly based on the use of longitudinal parts of metapodium diaphysis, these were not the only type of raw material available to produce bone pointed elongated objects, with opposite rounded or flattened ends. This is the case of to the “pointed palettes” found next to the Copper Age burials of Abautz Cave, in Guipúzcoa (Utrilla and Mazo, 1994:13). Despite being described as spatulas, these have been interpreted repeatedly as fastening elements for the dresses or shrouds of the deceased (Utrilla *et al.*, 2014:302). All seem to be made from ribs of large ungulates, as evidenced by their curved profile. The mere fact that they were clearly found next to the Chalcolithic burials recorded seems too weak an argument to identify them as flat rods like the ones recorded in the Eastern or Southeastern funerary sites (Rodanés, 1999:205), given the evident differences in design and in the bone raw material selected for the manufacture of both of them.

In the same way, the few pieces found in some megalithic burials in the North Plateau are not clearly pointed rods, but pins with a thicker and circular cross-section, or simply points or punches with little modification and clear traces of the medullar cavity (Delibes *et al.*, 1986:24-25, fig. 9-10; Rojo *et al.*, 2005:115, fig. 153:1; 201, fig. 232:1-4). The most recent excavations in some megalithic tombs at Portugal —for example, Monte Canelas I or Santa Margarida (Silva and Parreira, 2010; Gonçalves, 2003:132, fig. 62)— have shown the almost absolute predominance of bone pins with a massive circular cross-section, which can also be observed in most of the *tholoi* tombs of the Guadalquivir Basin (Altamirano and Lucíañez, 2016).

The marked scarcity of flat pointed rods in these megalithic tombs is quite surprising, considering that the few published studies of bone artefacts found in the contemporary and adjacent settlements show a relative widespread use of them (Murillo, 1991). Moreover, in the Guadalquivir Basin the rod type of widened distal end predominates, as, for instance, the rods of Cabezo Juré or Valencina de la Concepción (Nocete, 2004, Nocete *et al.*, 2013), which resemble more the “flat-head” or “spatula-shaped” (Spindler, 1981:87), or “fan-shaped” (Maicas, 2007:146) type, relatively scarce in the East of Iberia. Finally, in most cases clear signs of resharpening and an intensive use, which are extremely rare in the pointed flat rods found in the Eastern area, can be seen in the pieces of the Guadalquivir Basin.

In the Eastern area flat rods are undoubtedly concentrated in funerary caves, while they are relatively scarce in the settlements. Until now, no flat bone rod has been found in any tomb inside the inhabited area. This is shown in the graphic of the figure 6, which compares the number of fragments of flat rods recorded in burial caves of the High Serpis river Valley with those found in settlements excavated in the same area. In conclusion, the distribution on the Iberian Peninsula of what

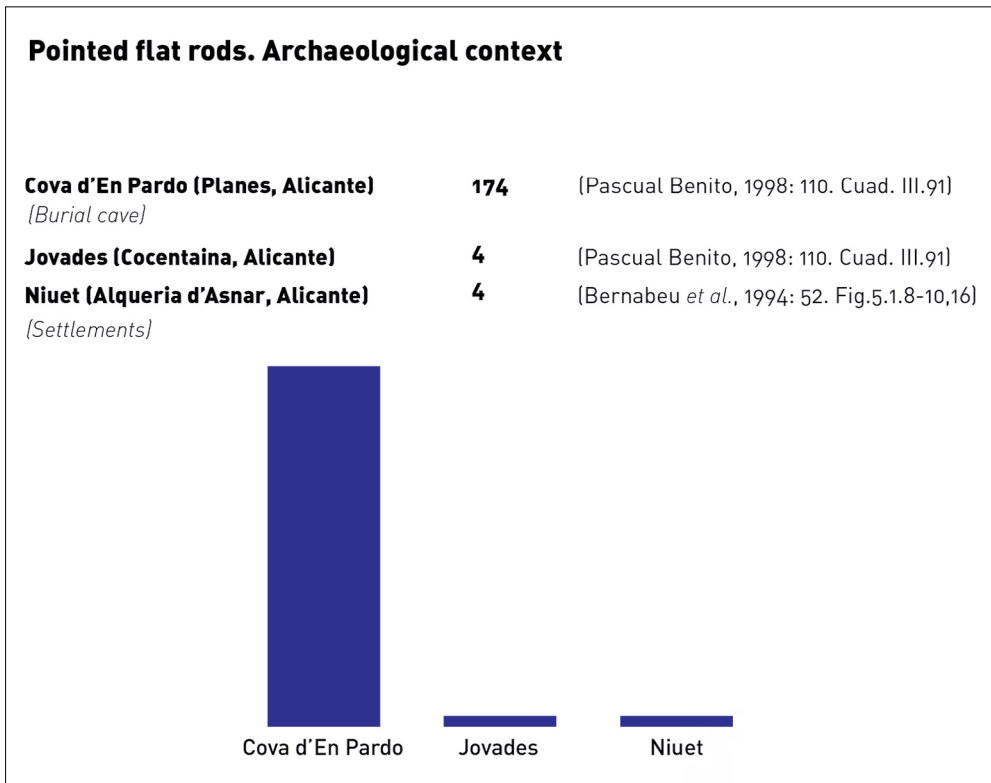


Fig. 6.—Number of flat bone rods in a burial cave and in two Chalcolithic settlements excavated in the Serpis River Valley, in the north of Alicante.

we could truly call pointed flat bone rods would be, more or less, restricted to the area shown in the figure 7. They would be common in the east and eastern area of the southeast of the Iberian Peninsula, disappearing towards the north of Castellón and the eastern part of Granada, but penetrating considerably into the hinterland, in the La Mancha area.

TOWARDS A RE-DEFINITION OF THE POINTED FLAT RODS OF BONE

This constitutes just one of the pieces of this puzzle. There are still essential questions to be solved, which need to be addressed by opening new lines of research. The last discoveries in Caravaca, Murcia, offer an excellent opportunity to evaluate whether there were indeed differences in the use of flat rods in the settlements

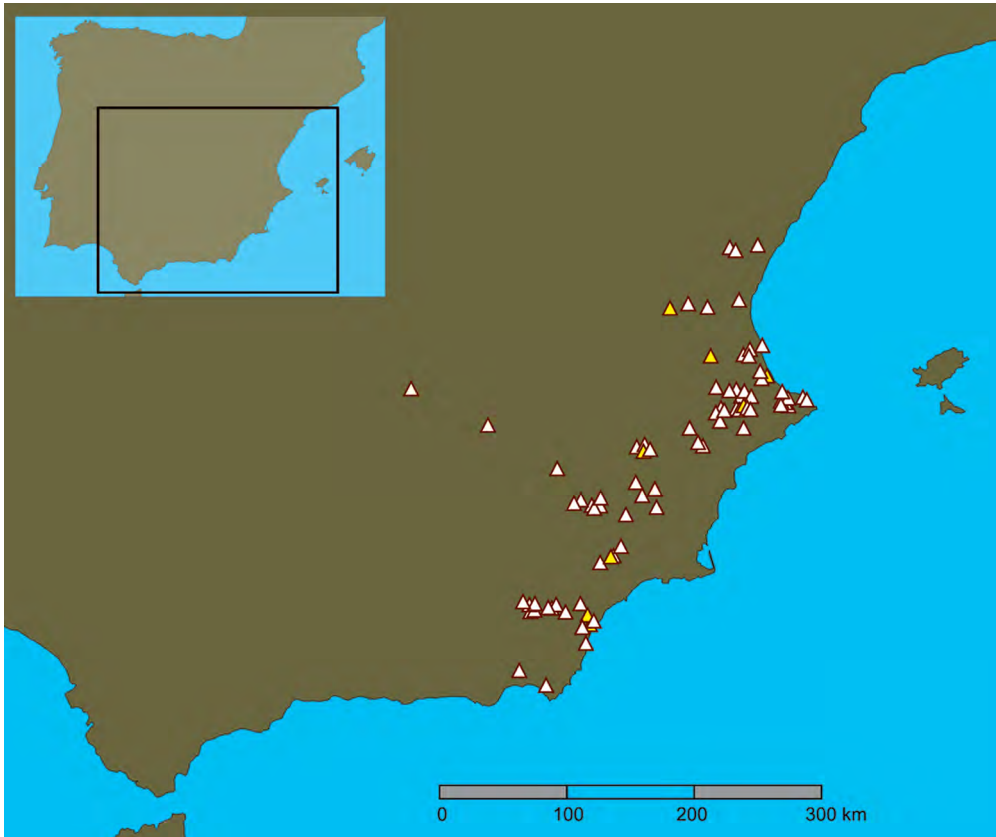


Fig. 7.—Distribution of flat bone rods in Final Neolithic-Chalcolithic sites of the east and southeast of the Iberian Peninsula. White triangles: burial sites (natural caves or megalithic tombs); yellow triangles: settlements.

and burial caves of this area. In 2009 a great burial cave was found in Caravaca. Radiocarbon dates indicate that it was used as burial ground for 400 years during the Copper Age, and the excavation revealed that inside the cave there were more than 1.300 individuals buried during this period (Lomba *et al.*, 2009). A considerable number of flat bone rods were found among the human bones and next to some of the skeletons and are currently under study.

More interesting is the excavation of the settlement from which the buried bodies came. It is a large site, with remains of houses and other domestic structures but, specially, deep storage silos excavated in the ground, some of them of great depth. Inside, a great number of bone artefacts have been found. Hopefully the study of these two sets of bone pieces, coming from two different contemporary archaeological contexts will be useful to develop a more precise knowledge of the social role of the flat rods.

It will be of great interest to know to what extent the flat bone rods were represented in the funerary grave goods of the megalithic tombs of Almeria, such as that of Piedra Ver, in Olula del Río (Martínez, 2016:103). This tomb, located in the Almanzora valley, would be of great interest to compare production techniques and types of bone artefacts present in the megalithic tombs of the area with those of the funerary caves of the east of the Iberian Peninsula.

It remains difficult to propose a precise chronology for the use of the bone flat rods in the burial caves of the 4th and 3rd millennia cal BCE of the east and southeast peninsular area. Even now, only 8% of them have accurate data on their stratigraphic and depositional contexts, and even fewer have a series of radiocarbon dates (Salazar *et al.*, 2016:11). However, published dates have multiplied in the recent decades, which has contributed considerably to establishing with higher precision the dates of the funerary use of the caves.

The radiocarbon dates obtained from human bones at Les Llometes and Grieta de Les Llometes (Alcoy, Alicante) (Salazar *et al.*, 2016) indicate the use of both caves as burial grounds from 4250 to 2380 cal BC. The Cave of La Pastora (Alcoy, Alicante) (McClure *et al.*, 2010) and Cova d'En Pardo (Planes, Alicante) (Soler *et al.*, 2010) also date to the second half of this interval. Other sites with bone rods have been published recently. The Avenc dels Dos Forats (Carcaixent, Valencia) has a single date for the beginning of funeral use in this part of the cavity in the second quarter of the 3rd millennium Cal BC (García *et al.*, 2010:150). Although partially unpublished, there are also several fragments of flat bone rods, located next to the burials from the Cova del Barranc del Migdia (Pedreguer, Alicante). The four dates published up to now of this site provide a general temporal framework around the first half of the 3rd millennium cal BC (Bolufer *et al.*, 2013:42).

There is one site with published radiocarbon dates from the Segura river basin in which this type of bone artefacts has been located (Lomba and Haber, 2016:356). The bodies of up to 1.300 individuals were deposited in Camino del Molino (Caravaca de la Cruz, Murcia). More than thirty bone pieces were found next to or mixed with the exhumed skeletal remains. There were also numerous flat rods among them. Radiocarbon has placed the beginning of the funerary use of

this cavity around 2900 cal BC (Lomba *et al.*, 2009:155). Unfortunately, we do not have radiocarbon data from other recently excavated funerary caves, such as Los Grajos III (Cieza, Murcia) or Cabezos Viejos (Archena, Murcia). The excavators propose a chronology of the beginning of the 3rd millennium BC (Lomba *et al.*, 1999) for the first cave from the study of the funerary goods found near the skeletons, and a more recent chronology within the Chalcolithic for the second, around the middle of the third millennium BC (Lomba and Zapata, 2005:35).

In conclusion, most of the evidence points to a widespread of the use of flat bone rods during the first half of the 3rd millennium cal BC, both in the Eastern and in the Murcian areas. The major concentration of flat bone rods in Cova d'En Pardo occurs in the upper levels of the stratigraphy (Soler, 2012). The radiocarbon dates recently obtained from human bones in other funerary cavities in the North of Alicante point to the same chronology (Soler *et al.*, 2017).

We lack traceological studies to support the different hypotheses about the possible use of these pointed flat bone rods. From my preliminary observations, it seems that a significant part of the best-preserved rods has no traces of use at their distal ends. The similar-shaped pieces of the recently studied Middle Neolithic burial grounds of the northeastern peninsular area show that, although some of them were used in various activities before being placed in the tombs, many others were never used or, if they were, their tips were re-sharpened to be ready for work (Mozota and Gibaja, 2015).

We have almost no contextual information for flat rods of bone in the collective burial sites of the Chalcolithic to help us to see a clear relation with their function. No matter how detailed the observation and documentation in the site is, obtaining functional data in burial caves is extremely difficult, as archaeological objects and human bones usually appear displaced, mixed or disconnected. Only in a few cases—individual burials or collective burials that have no postdepositional alterations—can some conclusions be drawn from the place in which the flat rods were found with respect to skeletons. Recent excavations in burial grounds of the Middle Neolithic at Catalonia have allowed re-testing the earlier observations of Serra Ràfols. The pieces appeared inside the Can Gambús tombs, excavated in 2003 at Sabadell (Roig *et al.*, 2010), had been placed next to the skeletons, usually forming packages, some of them near the skull. In some cases, one or two rods appeared on both sides of the head (Alliese *et al.*, 2014).

In our area of study, the cave that has provided more information about it is Cabezos Viejos, in Archena, Murcia, which is a funerary cave discovered at the beginning of the 21st century (Lomba and Zapata, 2005). The roof of the cave had disappeared, so it was possible to excavate the cave in the open air. Although many of the skeletons were removed and altered, some of them kept their original position almost intact. Around them more than 30 flat rods of bone were found, which could be linked to six of the twenty-one individuals buried. In some cases, the flat rods appeared mixed with the bones of the skeleton, and in others, they were found packed next to the bones of the hip. The most extraordinary case is individual no. 16. Its skull showed three large pointed flat rods, adhered by the

gypsum of the soil to the right parietal bone, in their original position (fig. 8). The placement of these rods, in an apparently fan-shaped position, suggests that they probably should be holding or adorning some type of hair bun or braid.

This is not the only relationship with hair ornaments that can be made. Researchers of Levantine rock art for which a Neolithic chronology is proposed (Hernández and Martí, 2002) have long associated some human figures with the use of hair ornaments, mostly interpreted as feathers (Jordá, 1971; Galiana, 1985). Although this seems most likely in many cases, it is interesting that the area in which there are representations and figures of Levantine rock art is almost the same in which we find the bone flat rods in funerary contexts (Utrilla and Bea, 2018).



Fig. 8.—Skull of the number 16 burial of Cabezos Viejos cave (Archena, Murcia). On the right parietal bone, there are three flat bone rods in their original position. Photo: Juan A. López Padilla.

Of course, this is just other evidence to keep in mind, but it must be considered along with other essential studies, especially the traceological ones.

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